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THE MEDIATING ROLE OF OPERATIONS MANAGEMENT PRACTICES ON THE RELATIONSHIP BETWEEN THE DIMENSIONS OF MANUFACTURING FLEXIBILITY AND COMPETITIVENESS

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ABSTRACT

Purpose: The aim of this study is to examine knowing the real role and impact of manufacturing flexibility on competitiveness through operations management practices, which is to determine the role and impact of manufacturing flexibility on competitiveness directly in the General Company for the Battery Industry. On the other hand, identifying the indirect role of flexible manufacturing systems in enhancing competitiveness.

Theoretical framework: The main purpose of the theoretical framework is to identify all the dimensions and variables included in the current study, and thus form a deep scientific view of the study and its variables.

Design/methodology/approach: field coexistence, personal interviews, and classification of data and information obtained in the questionnaire were adopted as the main tool used in the research and for a sample of 74 observations. Structural equations modelling was used to analyze the data using the programs (SPSS24, AMOS23).

Findings: the research reached important results that represent The most prominent of these is the significant impact of manufacturing flexibility in enhancing the competitiveness of the battery manufacturing company, and this effect is reinforced by improving operations management practices by the company.

Research, Practical & Social implications: The research was conducted in this company because it requires scientific research capable of solving many of its problems as a result of increased competition in the market, as well as the continuation of this company in production despite the cessation of many other companies as a result of.

Value: It stems from a vital issue related to aimed at a better future in terms of Operations Management Practices, Flexibility of Manufacturing, Operations Management Practices, and Competitiveness, especially after the crisis that led to a significant decline in the level of performance of organizations.

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O PAPEL MEDIADOR DAS PRÁTICAS DE GESTÃO DAS OPERAÇÕES NO RELACIONAMENTO ENTRE AS DIMENSÕES DA FLEXIBILIDADE E COMPETITIVIDADE FABRICANTE

RESUMO

Objetivo: O objetivo deste estudo é examinar o real papel e impacto da flexibilidade de fabricação na competitividade por meio de práticas de gerenciamento de operações, que é determinar o papel e o impacto da flexibilidade de fabricação na competitividade diretamente na Empresa Geral da Indústria de Baterias. Por outro lado, identificando o papel indireto dos sistemas flexíveis de manufatura no aumento da competitividade.
Enquadramento teórico: O objetivo principal do referencial teórico é identificar todas as dimensões e variáveis incluídas no estudo atual e, assim, formar uma visão científica aprofundada do estudo e suas variáveis.
Desenho/metodologia/abordagem: a convivência de campo, entrevistas pessoais e classificação dos dados e informações obtidas no questionário foram adotadas como principal ferramenta utilizada na pesquisa e para uma amostra de 74 observações. A modelagem de equações estruturais foi usada para analisar os dados usando os programas (SPSS24, AMOS23).
Resultados: a pesquisa alcançou resultados importantes que representam O mais proeminente deles é o impacto significativo da flexibilidade de fabricação no aumento da competitividade da empresa fabricante de baterias, e esse efeito é reforçado pela melhoria das práticas de gerenciamento de operações da empresa.
Pesquisa, Implicações Práticas e Sociais: A pesquisa foi realizada nesta empresa porque requer pesquisas científicas capazes de resolver muitos de seus problemas em decorrência do aumento da concorrência no mercado, bem como a continuidade desta empresa na produção apesar da cessação do muitas outras empresas como resultado.
Valor: Decorre de uma questão vital relacionada com a procura de um futuro melhor em termos de Práticas de Gestão de Operações, Flexibilidade de Manufatura, Práticas de Gestão de Operações e Competitividade, especialmente após a crise que levou a uma queda significativa no nível de desempenho das organizações .

Palavras-chave: Práticas de Gestão de Operações, Flexibilidade de Manufatura, Práticas de Gestão de Operações, Competitividade.

EL PAPEL MEDIADOR DE LAS PRÁCTICAS DE GESTIÓN DE OPERACIONES EN LA RELACIÓN ENTRE LAS DIMENSIONES DE FLEXIBILIDAD DE FABRICACIÓN Y COMPETITIVIDAD

RESUMEN

Propósito: El objetivo de este estudio es examinar el conocimiento del papel real y el impacto de la flexibilidad de fabricación en la competitividad a través de prácticas de gestión de operaciones, que es determinar el papel y el impacto de la flexibilidad de fabricación en la competitividad directamente en la Compañía General para la Industria de Baterías. Por otro lado, identificar el papel indirecto de los sistemas de fabricación flexibles en la mejora de la competitividad.
Marco teórico: El propósito principal del marco teórico es identificar todas las dimensiones y variables incluidas en el estudio actual, y así formar una visión científica profunda del estudio y sus variables.
Diseño/metodología/aproximación: se adoptó como principal herramienta utilizada en la investigación y para una muestra de 74 observaciones, la convivencia de campo, las entrevistas personales y la clasificación de los datos e informaciones obtenidos en el cuestionario. Se utilizó el modelado de ecuaciones estructurales para analizar los datos utilizando los programas (SPSS24, AMOS23).
Hallazgos: la investigación llegó a resultados importantes que representan El más destacado de estos es el impacto significativo de la flexibilidad de fabricación en la mejora de la competitividad de la empresa de fabricación de baterías, y este efecto se ve reforzado por la mejora de las prácticas de gestión de operaciones por parte de la empresa.
Investigación, Prácticas e Implicaciones Sociales: La investigación se realizó en esta empresa porque requiere de una investigación científica capaz de solucionar muchos de sus problemas producto del aumento de la competencia en el mercado, así como la continuación de esta empresa en producción a pesar del cese de muchas otras empresas como resultado de.
Valor: Se deriva de un tema vital relacionado con la búsqueda de un futuro mejor en términos de Prácticas de Gestión de Operaciones, Flexibilidad de Manufactura, Prácticas de Gestión de Operaciones y Competitividad, especialmente después de la crisis que condujo a una disminución significativa en el nivel de desempeño de las organizaciones.

Palabras clave: Prácticas de Gestión de Operaciones, Flexibilidad de Manufactura, Prácticas de Gestión de Operaciones, Competitividad.

INTRODUCTION

Many international companies depend their success in the competitive environment on flexibility as a strategic option, the most prominent of which is the flexibility of manufacturing, and this success is achieved in parallel with the success of practices related to the management of production processes that guarantee the transformation of inputs into outputs. The customer and his loyalty, in this research, the focus will be on the flexibility of size, work and supply chain as they are the important considerations when adopting manufacturing flexibility as a competitive strategy by companies, as well as the importance of competitiveness in achieving the requirements of competitive advantage for those companies, as success is achieved whether for manufacturing flexibility or competitive advantage from through operations management practices.

Flexibility has become one of the most useful and necessary tools in today's competitive markets. Manufacturing flexibility is seen as a critical component for achieving a competitive advantage in the marketplace. It is one of the most desirable characteristics of manufacturing organizations and has generated great interest among researchers and professionals (Jain et al.,2013). Although manufacturing flexibility is important to the survival of manufacturing firms, manufacturing flexibility has been implemented on a piecemeal basis often without achieving any improvement (A et al., 2022) (Rogers et al.,2011), and on this basis, this research paper aims to consider the assumptions that collectively refer to the impact of manufacturing flexibility on competitiveness through operations management practices. As it was relied on a set of variables to measure manufacturing flexibility (the flexibility of size, work and supply chain) as the most influential variables in the shift towards manufacturing flexibility.

LITERATURE REVIEW

Manufacturing Flexibility

Resilience is the main interface between the system and external environmental changes, and according to this interpretation it serves to absorb external disturbances that can cause disruption to the system as a whole (Ali et al.,2014). Manufacturing flexibility emerged as a strategic factor due to economic turmoil during the 1970s and increased efficiency starting in the 1980s. Increasing efficiency and turbulent markets enhance the production of goods with a short life cycle and product complexity in order to meet the desires of customers, so manufacturing systems need to adapt quickly to these changes, (Calvo, et al,2011) and (Cousens et al.,2009) stresses that the operational capabilities that are related to flexibility are resources

and competencies that companies must consider and require them to develop competitiveness to be able to adopt manufacturing flexibility, because all A firm views manufacturing resilience in its own way and manufacturers can define manufacturing resilience in either an adaptive or proactive manner (Ojstersek & Buchmeister,2020) .

Manufacturing efficiency related to manufacturing flexibility represents the system's ability to meet requirements in terms of quantity, quality and time, while efficiency represents the optimal planning and scheduling of all system resources (Ojstersek & Buchmeister,2020), as manufacturing is still forced to comply with uncertain market demands. and dynamism, and what we need is to raise the level of manufacturing perspective while recognizing that manufacturing flexibility offers more than just flexible machines for production. Table (1) shows the parts that are required to be flexible to match the trend towards flexible manufacturing (Ojstersek & Buchmeister,2020).

Table (1) Indicators of manufacturing elasticity

Manufacturing Flexibility Indicators	The Description
Mix flexibility	**The ability of a manufacturing system to switch between different products in the product mix**
Size Flexibility	**The ability of a manufacturing system to change the size of the output of the manufacturing process**
Flexibility of the new product	**The ability of a manufacturing system to integrate a new product(s) with the existing product group**
machine flexibility	**The ability of the machine to perform more than one process to produce different parts or products**
Flexibility of material handling	**The ability of the material handling system to handle different types of materials, as dissimilar parts are handled without affecting the performance of the existing system**
Work flexibility	**The ability of workers to perform more than one task in the manufacturing system**
Routing Flexibility	**The ability of a manufacturing system to manufacture products through a variety of different ways**

Resource: Tan, K. W., & Lim, K. T. (2019). Impact of manufacturing flexibility on business performance: malaysian's perspective. Gadjah Mada International Journal of Business, 21(3), p312.

Operations Management Practices

In this paragraph we do a brief analysis of the most commonly used operations practices that aim to improve the overall performance of the company, and operations practices refer to every systematic procedure or solution implemented in the company that aims to improve the efficiency of production and logistics operations, so in this paragraph we clarify some of these Practices focusing on the design of production capacity, internal arrangement and scheduling, and some others call these practices operational decisions.

Energy design is concerned with determining how the good or service is produced, and thus determining the nature of the required technology, human resources and capital investments, while internal arrangement is concerned with facilitating the way materials and information flow between different levels and workers in the company in order to increase its effectiveness, while scheduling is concerned with determining short and medium schedules The duration of customer requests and therefore scheduling activities accordingly, (Heizer et al.,2017). One of the major unresolved issues in the management literature is the extent to which managerial processes and practices are applied to a wide range of organizations. Operations, for example in relation to the human factor. More advanced practices emphasize the importance of workforce training and empowerment, i.e. giving workers greater autonomy and providing them with mechanisms to participate in decision-making. In terms of supply chain management, collaboration and relationships based on trust are crucial to competitive success. Quality is also a key competitive priority, as is internal ranking (Blundo et al.,2021) .

Operations practices or decisions are the main entry points for improving operations and determining their strategic direction. Operations strategy is largely related to these practices. The cost leadership strategy is directly affected by these practices, as well as the quality strategy or rapid response.... etc, as operations management practices contribute to Enhancing the competitive capabilities of industrial and service companies, which are closely related to them.

Competitiveness

Companies can compete through several dimensions. Common competitive priorities adopted by industrial companies include different dimensions such as cost, quality, delivery, flexibility and innovation. However, consumers rarely make their purchasing decisions based on only one dimension, for example a cost-conscious consumer focuses on cost but takes Considering a certain level of product quality as well, and this means that the company must be able to compete in multiple dimensions, so competitiveness is the actual competitive strength of the company, i.e. the extent to which the company is able to achieve the common competitive priorities - cost, quality, delivery, flexibility and development time - compared to its competitors (Abuzaid et al., 2022) (Angeles1 et al.,2022). Competitiveness differs in general from one country to another, and from one sector to another, and even from one specialty to another. The economic view differs from the managerial view, but at the level of production processes these differences fade to a large extent, while the study conducted by (Dwivedi, et al.,2021) indicated that there are differences in the field of manufacturing also between many

European countries, as well as the factors that support the competitiveness of these countries such as the human resource, so international companies tend to adopt modern practices to enhance competitiveness through: (Swink et al.,2014)

- Assist in improving the practices, capabilities and results of organizational performance.
- Facilitate communication and exchange of information on best practices among all organizations.
- The practices serve as a working tool for understanding and managing performance and for guiding planning and learning opportunities.

On this basis, operations strategy is closely related to competitiveness, as customer-led operations strategy requires a cross-functional effort by all areas of the company to understand the needs of the company's external customers and to determine the operational capabilities that the company requires to outperform its competitors, and this strategy also addresses the needs of internal customers because performance The company's overall performance depends on the performance of its basic and supportive operations, which must be coordinated to provide the desired overall result to the external customer (Krajewski, et al.,2016), and on the other hand, (Slack & Brandon-Jones,2018) indicated that competitiveness supports in a way that The competitive advantage is the main pillar on which the operations department is based when developing its competitive strategy. Therefore, competitiveness supports the following competitive strategies:

- Quality: doing things right, providing flawless goods and services.
- Speed: Reducing the time between a customer's order for goods and services and their entire delivery process.
- Reliability: doing things on time, and delivering on delivery promises.
- Flexibility: the ability to change or adapt process activities to deal with unforeseen circumstances or to introduce new products or services
- Cost: producing a good or service at a low cost.

MATERIAL AND METHODOLOGY

Flexible manufacturing systems are of great importance to production and service companies alike and as a successful strategy to increase market share and enhance competitive advantage through the capabilities these companies possess that qualify them for the competitive battle, as is the case for operations management practices, which are the cornerstone of the success of any production or service system From this point of view, the main problem of research centers on the ability of manufacturing systems in Iraq to transform

and adopt flexible systems in manufacturing as the important way to confront external competition, as well as to verify the role that flexible manufacturing systems play in enhancing competitiveness through operations management practices, so the importance of The research is one of the importance of the variables adopted in the current research, as the issue of manufacturing flexibility is the basis for the success of competitive excellence in the light of competitive capabilities, as well as the importance of process management practices in this success and the most important practices of operations management in the research sample company, as well as the impact of manufacturing flexibility on ability Competitiveness through operations management practices.

The main objective of the research is focused on knowing the real role and impact of manufacturing flexibility on competitiveness through operations management practices, which is to determine the role and impact of manufacturing flexibility on competitiveness directly. On the other hand, identifying the indirect role of flexible manufacturing systems and their role in enhancing competitiveness. To achieve this goal, it was covered through field coexistence, personal interviews, and classification of data and information obtained in the questionnaire as the main tool used in the research and for a sample of 74 views. Hence, the research is based on three hypotheses:

a. There is a significant, statistically significant effect of manufacturing flexibility (size, work, supply chain) on competitiveness.

b. There is a significant statistically significant effect of manufacturing flexibility (volume, labor, supply chain) on operations management practices.

c. Manufacturing flexibility in its dimensions has a statistically significant effect on competitiveness in the presence of process practices as a control variable (control) .

d. Operations practices mediate the relationship between the dimensions of manufacturing flexibility and competitiveness.

RESULTS AND DISCUSSION

The current study presents a detail of the results of the statistical description of the variables included in the research and their expressed dimensions, using the descriptive statistics tools represented by the arithmetic mean, standard deviation, coefficient of variation, relative importance and calculated through it, and the level of the answer that was arranged after dividing it into five categories. In addition, the correlation coefficient was calculated between Research variables and at the level of dimensions also to verify that there are no high

correlations indicating the existence of the problem of linear correlation (linear duplication) between the dimensions of the independent variable, and the following paragraphs were allocated below to display and discuss the results of descriptive statistics represented by the results of measuring the arithmetic circles for the paragraphs representing dimensions, variables and deviations Normative and coefficients of difference and then the level of the answer and the relative importance with the interpretation of both according to the data and details presented below and sequentially.

Manufacturing Flexibility

Manufacturing flexibility represents an independent or explanatory variable for research, embodied in three dimensions (size, work, and supply chain management), which will explain the results of descriptive statistics for each dimension and discuss it according to the following:

A. Size: The results of the descriptive analysis related to the dimension of size shown in Table (2) showed that the fourth paragraph (we have the ability to change the production quantities for our products) achieved the highest arithmetic mean (4.0541) with a relatively low standard deviation of (0.97772). These results were reflected in the reduction of the value of the coefficient of variation (0.2411), which is the lowest among the rest of the paragraphs and with a high response level, which made it occupy the first relative importance. This indicates the high agreement of the answers of the sample about the paragraph, which indicates the tangible convergence between them. As for the lowest arithmetic mean, it reached (2.7432) in the third paragraph (manage the various economic sizes) with the highest standard deviation (1.37553). These results were reflected in raising the value of the dispersion coefficient (0.5014) with a moderate answer level and with a relative importance. Its relative importance fluctuated between these two paragraphs for this dimension, and the level of response determined between moderate and high.

Table (2). Descriptive Statistics for The Size Dimension

descriptive statistics Items	Mean	standard deviation	coefficient of difference	answer level	Relative importance
We work efficiently on different sizes of output	3.6081	0.91887	0.2546	High	2
All different volumes of production have a return to the company	3.3514	1.11567	0.3329	Moderate	4
We run various economical sizes	2.7432	1.37553	0.5014	Moderate	6
We have the ability to change the production quantities of our products	4.0541	0.97772	0.2411	High	1
We can change the production volume according to the manufacturing process	3.2568	1.32480	0.4067	Moderate	5
Possibility to increase production capacity through outsourcing	3.7297	0.99722	0.2673	High	3
The overall mean of the dimension	3.4572	0.83814	0.2424	High	1

Source: Prepared by the authors (2022).

B. Work: This dimension represented seven paragraphs. The results of the descriptive analysis were presented in Table (3), where the sixth paragraph (the workers in different departments are trained in the factory) achieved the highest arithmetic mean (4.4324), with a standard deviation that is the lowest, reaching (0.72303). Reducing the value of the coefficient of variation (0.1631) and at a high level of response, which made it occupy the first relative importance. He indicated the high agreement of the answers of the sample members on this paragraph. As for the lowest arithmetic mean, it reached (3.6322) in the fifth paragraph (workers are trained in multiple cells and teams with the highest standard deviation (1.08889), these results were reflected in raising the value of the dispersion coefficient (0.2973) with a high answer level and a final relative importance. The relativity between these two paragraphs for this dimension and the level of the answer is high.

Table (3). Descriptive Statistics for The Work Dimension

Descriptive statistics Items	Mean	Standard Deviation	Coefficient Of Difference	Answer Level	Relative Importance
The worker is exemplary and has the ability to use different tools efficiently and effectively.	3.7973	0.92128	0.2426	High	6
Employees are trained by performing a variety of activities.	3.6486	0.88259	0.2418	High	5
Workers operate different types of machines.	3.9595	0.83484	0.2108	High	4
Our employees have strong problem-solving abilities at work.	4.2027	0.89105	0.2120	High	3
Workers are trained in multiple cells and teams.	3.6322	1.08889	0.2973	High	7
Workers in various departments are trained in the factory.	4.4324	0.72303	0.1631	High	1
Teams are reorganized in response to product or process changes.	3.9614	0.53048	0.1339	High	1

Source: Prepared by the authors (2022).

C. Supply Chain Management

This dimension was embodied in eight paragraphs that showed the results of the descriptive analysis in (4) where the fifth paragraph (We establish long-term relationships with suppliers) achieved the arithmetic mean (3.9054) relatively high with a standard deviation is the lowest, which reached (0.72469) these results led to a decrease in the value of the coefficient The difference (0.1855) with a high response level and with a first relative importance, and in contrast, the lowest arithmetic mean was (3.1486) in the sixth paragraph (we depend on a small number of highly qualified suppliers) with a standard deviation (1.01607) and the relatively high was reflected in raising the value of Variation coefficient (0.3226) with a moderate answer level and with an eighth and final relative importance in their order. This result indicated a high difference in the answers of the sample members about what this paragraph contains. As for the rest of the dimension paragraphs, their relative importance was limited between these two paragraphs to this dimension.

Table (4). Descriptive Statistics for The Supply Chain Management Dimension

Descriptive statistics Items	Mean	Standard deviation	Coefficient of difference	Answer level	Relative importance
Suppliers supply materials of different sizes with small delivery times differences	3.7568	1.10801	0.2949	High	5
The cost of one unit changes slightly in different quantities	3.6081	0.94821	0.2628	High	4
We provide technical assistance to our suppliers	3.3919	1.07037	0.3155	Moderate	7
Our suppliers help with product design and innovation	3.4054	1.03260	0.3032	High	6
We establish long-term relationships with suppliers	3.9054	0.72469	0.1855	High	1
We rely on a few highly qualified suppliers	3.1486	1.01607	0.3226	Moderate	8
Teams are reorganized in response to product or process changes	3.6014	0.53542	0.1486	High	3

Source: Prepared by the authors (2022).

Operations Management Practices:

This variable included twelve paragraphs as a one-dimensional variable, where the results of its statistical description and as presented in Table (5), whose results showed that the eighth paragraph (correctly making use of the available space) achieved the arithmetic mean (3.9730) relatively high and with a deviation My criterion is the lowest (0.82716). These results led to a decrease in the value of the dispersion coefficient (0.2081) with a high answer level and with the first relative importance in its rank. On the other hand, the lowest arithmetic mean was (2.7162) in the eleventh paragraph (increase or decrease working hours according to Demand) with a standard deviation (1.09194) and relatively high, this was reflected in raising the value of the coefficient of variation (0.4020) with a moderate answer level and with a last relative importance in its arrangement, while the rest of the paragraphs of the variable fluctuated in their relative importance between these two paragraphs for this variable.

Table (5). Descriptive Statistics for The Variable of Operations Management Practices

descriptive statistics Items	Mean	Standard deviation	coefficient of difference	answer level	Relative importance
The company does not invest in systems that take a long time to pay for it	3.9459	0.93475	0.2368	High	4
The company is able to respond to sudden changes in demand quickly	3.9595	0.91321	0.2306	High	3
The company contracts to work with other companies when the demand is high	3.5541	1.00875	0.2838	High	8

The company is able to accurately forecast demand	4.0946	0.98160	0.2397	High	5
Sections are grouped by products that are dealt with	3.6351	1.11741	0.3073	High	9
The flexibility of the design enables the company to make improvements and expansions within the factory	3.2703	1.16216	0.3553	Moderate	11
Ease of handling materials from one section to another	3.7568	0.93356	0.2485	High	6
Properly make use of the available space	3.9730	0.82716	0.2081	High	1
The company maintains continuous production and supply	3.7027	0.93237	0.2518	High	7
The company hires more workers when the demand increases	3.8784	0.85932	0.2215	High	2
Increase or decrease working hours on demand	2.7162	1.09194	0.4020	Moderate	12
Employees work overtime more often to clear the backlog	3.0000	1.04685	0.3489	Moderate	10
Teams are reorganized in response to product or process changes	3.6239	0.58541	0.1615	High	7

Source: Prepared by the authors (2022).

Competitiveness: This variable contained ten paragraphs and as a one-dimensional variable as well. The results of the statistical description presented in Table (6), whose results showed that the seventh paragraph (the company has qualified suppliers through whom it seeks to excel and excel in providing its products) achieved the arithmetic mean (3.8243) and relatively high and with a standard deviation of the lowest (0.81691), which led to a decrease in the value of the coefficient of variation (0.2136) and with a high level of answer and with the relative importance of the first in its rank, and in contrast, the lowest arithmetic mean was (2.9189) in the sixth paragraph (the company focuses its efforts and products towards A number of market sectors in order to achieve distinction) with the standard deviation (1.40212) is the highest among the rest of the paragraphs of the dimension. for this variable.

Table (6). Descriptive Statistics of the Competitiveness Variable

Descriptive statistics Items	Mean	Standard deviation	Coefficient of difference	Answer level	Relative importance
The company is keen to provide high quality products at the lowest costs.	2.9595	1.11576	0.3770	Moderate	8
The company is working to get rid of unnecessary routine procedures in order to save cost, time and effort.	3.4054	1.03260	0.3032	High	3
The company is a mechanism through which it is ensured that resources are used efficiently without extravagance or waste	3.9459	0.90496	0.2293	High	2
The company's products are new and distinguished from other competing companies	2.9865	1.11642	0.3738	Moderate	7

The company offers distinguished products that exceed the expectations of customers.	3.2027	1.04658	0.3267	Moderate	4
The company focuses its efforts and products towards a number of market sectors in order to achieve excellence.	2.9189	1.40212	0.4803	Moderate	10
The company has qualified suppliers through whom it seeks to excel and excel in providing its products.	3.8243	0.81691	0.2136	High	1
The company is able to change its strategies in response to conditions and changes in the external environment.	2.8919	1.20009	0.4149	Moderate	9
The company periodically analyzes the competitive environment as well as competitors' products.	3.0000	1.05985	0.3532	Moderate	6
The company is interested in identifying and knowing its potential and current competitors.	3.3514	1.13996	0.3401	Moderate	5
Teams are reorganized in response to product or process changes	3.2486	0.43800	0.1348	High	4

Source: Prepared by the authors (2022).

Before initiating the process of testing the hypotheses, the details of which are explained in the second paragraph of this research, a correlation matrix was prepared between the dimensions and the variables represented for this research, which are shown in Table (7). The independent variables in particular, and when looking at the correlation matrix, it becomes clear that all the correlations are all below the level of (71.) between the dimensions of the independent variable on the one hand and the mediator and the dependent on the other hand, as these results indicated the possibility of conducting a research hypothesis test because there is no problem of duplication or Linear alignment.

Table (7). The Correlation Matrix Between the Dimensions of the Research Variables

Dimensions and variables		**the size**	**the work**	**Supply Chain Management**	**Operations management practices**	**Competitiveness**
the size	*Pearson correlation*	1	621**	.707**	.531**	.607**
	Parameter significant		0.000	0.000	0.000	0.000
The work	*Pearson correlation*	.621**	1	.613**	.596**	.571**
	Parameter significant	0.000		0.000	0.000	0.000
Supply Chain Management	*Pearson correlation*	.707**	.613**	1	.513**	.519**
	Parameter significant	0.000	0.000		0.000	0.000
Operations management practices	*Pearson correlation*	.531**	.596**	.513**	1	.511**

	Parameter significant	0.000	0.000	0.000		0.000
Competitiveness	*Pearson correlation*	.607**	.571**	.519**	.511**	1
	Parameter significant	0.000	0.000	0.000	0.000	0.000

Source: Prepared by the authors (2022).

HYPOTHESIS TESTING

The process of testing hypotheses (multiple linear regression models) needs to ensure the condition of the normal distributions of the data of the dimensions and research variables. Therefore, parametric tests can be used, which impose the condition of the existence of a linear relationship between the dimensions, which was shown in the previous paragraph (the correlation matrix), in addition to achieving the characteristic of its normal distribution, which Its results are shown in Table (8). According to the (Kolmogorov_Smirnov) test, which fulfills the condition when the test results are not significant, we accept the hypothesis of a normal distribution and reject the alternative hypothesis and vice versa according to the following formula for the hypothesis:

Ho: the data are normally distributed (HO: P = 0).

H1: The data is not normally distributed (HO: P ≠ 0).

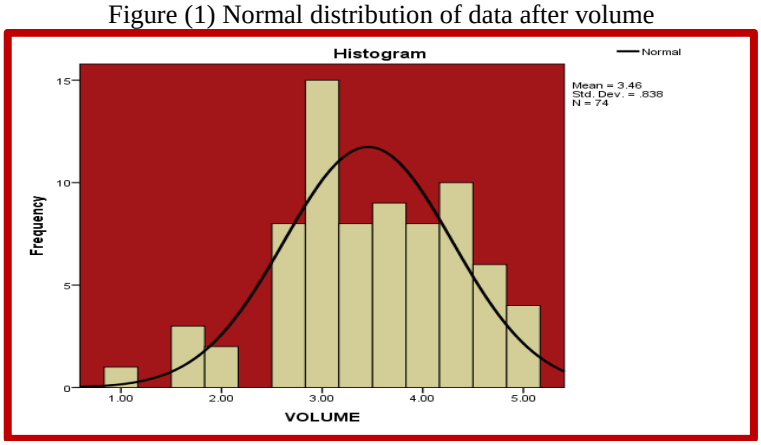
Table (8). Results of the normal distribution test for the dimensions and variables of the research

Test type and parameters	**Kolmogorov-Smirnov**		
	Test Statistics	**Significance value**	**Significance the test**
Variables and their dimensions			
		Manufacturing Flexibility	
the size	.081	.200*	insignificant
the work	.083	.200*	insignificant
Supply Chain Management	.090	.200*	insignificant
Operations management practices	.078	.200*	insignificant
Competitiveness	.075	.200*	insignificant

Source: Prepared by the authors (2022).

It is evident from Table (8) that all data of the dimensions and variables of the research were not significant (P>0.05), and therefore the hypothesis of a normal distribution can be accepted, that is, the data are distributed normally, and the alternative hypothesis is rejected. A basic condition for using the linear regression model, and Figure (1) expresses the graphical representation of the normal distribution of the data of the size dimension.

Figure (1) Normal distribution of data after volume



Source: Prepared by the authors (2022).

A detailed presentation was made of the results of hypothesis testing, for which the multiple regression model was employed using the programs (SPSS24 and AMOS23), and this relationship includes the text of four main hypotheses that are presented in the research methodology as follows:

First Hypothesis: Table (9) is presented regarding the results of testing the first main hypothesis, as it is clear that the significant effect of the two dimensions of size has the strongest effect (.36, P = 0.010 = β) and after working in light of the beta coefficient (.29, P = 0.019 = β). In the competitive ability variable as a dependent variable, the supply chain management dimension did not have a significant effect on this relationship (.09, P>0.05 = β), as for the explanatory power of the model according to the value of the coefficient of determination, it was (R2 = .43) and with complete statistical significance (P = 0.000), in other words that (43%) of the variance of the competitiveness variable is explained by both the dimensions of size and work, and certainly the remaining percentage of the coefficient of determination (57%) and the unexplained belong to other factors outside the scope of the current research limits.

Table (9) Results of the first hypothesis test

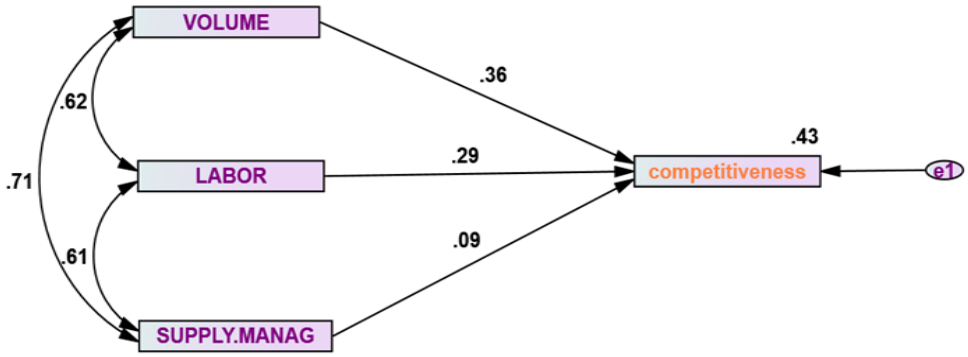
Statistical indicators / Regression paths (hypotheses)	Gradient parameter B	Statistics A test Sample T	Para-meter signi-ficant Sig.	Labs Interpre-tation R^2	Statistics A test Sample F	Signi-ficance test model P
Size Competitiveness	.36	2.658	.010			
Work Competitiveness	.29	2.409	.019	.43	17.848	.000
Supply Chain Management Competitiveness	.09	0.678	.500			

Source: Prepared by the authors (2022).

Figure (2) expresses the graphic relationship tested under this first main hypothesis using the AMOS 23 program, which shows the regression paths from the dimensions of the manufacturing el

asticity variable (size, labor, and supply chain management) towards the competitiveness variable and the values of the incoming beta coefficients Which proved its significance in the dimension of size and work without managing the supply chain, and thus the validity of this hypothesis and its partial acceptance at the level of these two dimensions.

Figure (2). Regression trajectories of the relationship between the dimensions of the manufacturing flexibility variable and the competitiveness variable



Source: Prepared by the authors (2022).

The second hypothesis: It is evident from the table (10) regarding the results of the second hypothesis test of this research, which shows a significant continuity of the effect of the dimensions of the size (.19, P<0.05=β) and after working with a stronger effect in terms of the value of the beta coefficient (.40, P<0.01 =β) in the variable of operations management practices, which is the second step of the intermediary role tests, while the dimension of supply chain management had no significant effect in this test model (.13, P>0.05=β), as for the explanatory power of this model and according to the value of the coefficient The determination in it is (R2 = .41) and with complete statistical significance (P = 0.000), meaning that (41%) of the variance of the operations management practices variable was subject to the variance of the dimensions of size and work, and regarding the remainder of the unexplained value (59%) is also attributed to Other variables and factors were not of interest to the research Present.

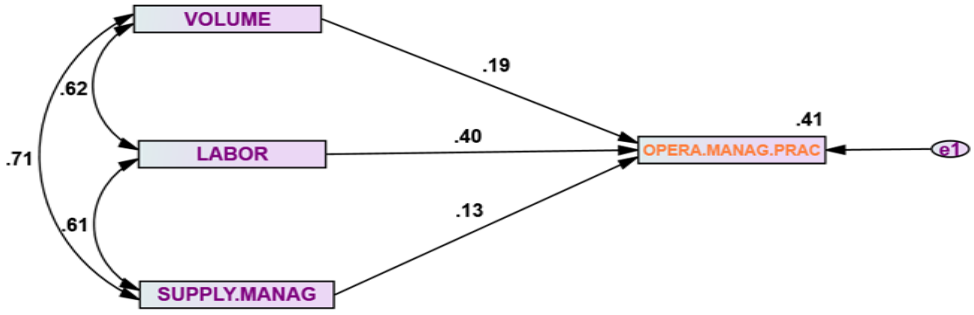
Table (10). Results of the second hypothesis test

Statistical indicators Regression paths (hypotheses)	Gradient parameter B	Statistics A test Sample T	Para-meter signi-ficant Sig.	Labs Interpre-tation R^2	Statistics A test Sample F	Signi-ficance test model P
Size Competitiveness	.19	1.978	.048			
Work Competitiveness	.40	2.909	.002			
Supply Chain Management Competitiveness	.13	0.678	.135	.41	15.905	.000

Source: Prepared by the authors (2022).

With regard to the graphic representation (3) of the relationship stipulated in the second hypothesis of the research, through which the regression paths represented by unidirectional arrows and the values of the apparent beta coefficients above them are shown, directed from the dimensions of the manufacturing flexibility variable towards the variable of operations management practices, and as Table (10) confirms the significance of the regression path Beta coefficients related to the dimension of size and work, which confirms the validity of this hypothesis and its acceptance also in part and at the level of the two mentioned dimensions only.

Figure (3) Regression trajectories of the relationship between the dimensions of the manufacturing flexibility variable and the operations management practices variable



Source: Prepared by the authors (2022).

The third hypothesis: The results of testing the third hypothesis of including the test model for the operations management practices variable with the dimensions of the manufacturing flexibility variable and their impact on the competitiveness variable, detailed in Table (11), showed the significant effect of the operations management practices variable (.17, P = 0.045 = β) on The competitive ability variable, as this result is the third step or condition achieved in the mediating role tests, which states the necessity of the significance of the mediator variable in the presence of the dimensions of the independent variable, and with regard

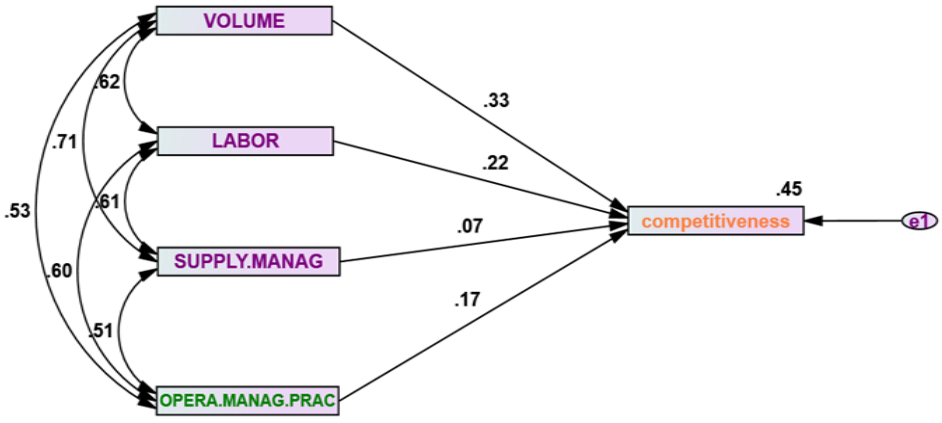
to the explanatory power, its percentage and according to the value of the interpretation coefficient (R2 = .45) with complete statistical significance (P). =0.000

Table (11). Results of the third hypothesis test

Statistical indicators Regression paths (hypotheses)	Gradient parameter B	Statistics A test Sample T	Para-meter signi-ficant Sig.	Labs Interpre-tation R^2	Statistics A test Sample F	Signi-ficance test model P
Size Competitiveness	.33	2.713	.018			
Work Competitiveness	.22	2.182	.034			
Supply Chain Management Competitiveness	.07	.513	.610	.45	14.107	.000

Source: Prepared by the authors (2022).

Figure (4) Regression trajectories of the relationship between the dimensions of the manufacturing flexibility variable and the variable of operations management practices in the variable of competitiveness



Source: Prepared by the authors (2022).

Fourth Hypothesis: The results of testing this hypothesis resulted according to what is presented in Table (12), which shows the results of the direct and indirect influence of the dimensions of manufacturing flexibility as an independent variable through operations management practices as a mediating variable in the dependent variable represented in competitiveness, which results from these two effects (direct and indirect).when merging them with what is known as the total effect, the diagnostic mechanism is determined by the nature of the relationship to the mediating role represented by the significance of the test results for the two mentioned effects. Only on the indirect, this indicates that the mediating variable mediates the relationship completely or completely.

Table (12). Results of the fourth hypothesis test

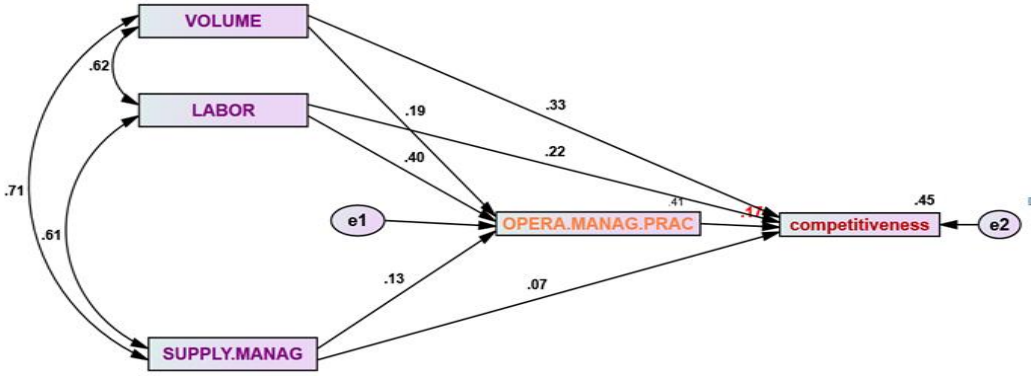
Statistical indicators Regression paths (hypotheses)	Gradient parameter B	Statistics A test Sample T	Para-meter signi-ficant Sig.	Labs Interpre-tation R^2	Signi-ficance test model P
Size Competitiveness	**.33**	**2.713**	**.018**	.	
Work Competitiveness	**.22**	**2.182**	**.034**		
Supply Chain Management Competitiveness	**.07**	**.513**	**.610**	45	.000
Size Operations management practices	**.19**	**1.978**	**.048**		
Work Operations management practices	**.40**	**2.909**	**.002**		
Supply Chain Management Operations management practices	**.13**	**0.678**	**.135**	.41	.000
Operations management practices Competitiveness	**.17**	**2.373**	**.026**		

Source: Prepared by the authors (2022).

Table (12) presents the results of testing this hypothesis, which shows the significance of the direct effect in the two dimensions of size and work as two independent dimensions of competitiveness as a dependent variable.), As for the explanatory power, it reached in the light of the interpretation coefficient (R2 = .45), with a statistical significance (P = 0.000), and with regard to the results of the indirect effect test, the significance of the two paths after size and work as independent dimensions was also confirmed. 19, P = 0.048) =β) and .40, P = 0.002) = β) without the supply chain management dimension, and with regard to the path of influence of a variable of management practices in the variable of competitiveness, its significance was proved by the path of that relationship. 17, P = 0.026 (= β), This confirms the mediating role and its partial form.

Figure (5) expresses as a graphic representation of the direct and indirect impact pathways described within the fourth hypothesis of the tests of the mediating role of operations management practices in the relationship between the dimensions of the manufacturing flexibility variable and the competitiveness variable, which proved that the manufacturing flexibility variable has a direct impact on competitiveness through the dimensions of size and work and an unfavorable effect.

Figure (5) Paths of the mediating role of operations management practices in the relationship between the dimensions of the manufacturing flexibility variable and competitiveness



Source: Prepared by the authors (2022).

Direct through the variable of operations management practices in competitiveness, which indicates the absence of the full role of the mediator and confirms the partial role of him.

CONCLUSIONS

Flexibility of size and work plays a major role in enhancing competitiveness, and these two variables also play an important role in improving operations management practices, which in turn greatly affect the competitiveness of the researched company. How important is the role that size, labor and supply chain play as basic dimensions in adopting flexible manufacturing systems. The process of training workers and the ability to produce in different quantities and establish relationships with suppliers is the cornerstone for companies that are characterized by flexibility. It turns out that the practices of operations management, represented by internal arrangement, scheduling, and energy design, have a significant impactful role in enhancing the competitiveness of the company under study. Operations management practices have a partial impact on the relationship between manufacturing flexibility in its dimensions and competitiveness. From this standpoint, the importance of flexible manufacturing systems becomes clear as it is a very important strategy adopted by many international companies in improving and increasing the market share of their products, and there are many factors that contribute to the shift towards flexibility of production processes, and from here the company can rely on the flexibility of size, work and supply chain as foundations for dealing with this flexibility. The company must understand the great role that manufacturing flexibility plays in increasing competitiveness, and this ultimately leads to enhancing the competitive advantage pursued by the company by paying attention to operations management practices as they represent the success link between flexible manufacturing systems and the company's competitiveness. We encourage in the future to study these variables in other environments

and other sectors, with the aim of benefiting from building competitive capabilities for these sectors, whether service or production.

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