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The Impact of Knowledge Management on Added Value of Supply Chains: An Empirical Study

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ABSTRACT

The study aimed to determine measurement dimensions for knowledge management and demonstrate the significance of organizations' reliance on advanced technological systems. In addition, the study aimed to identify the impact of knowledge management on added value of supply chains. The study revealed numerous findings. First, subsidiaries of the studied sector lack the liquidity rates necessary to finance and maintain the technological infrastructure of these organizations. Moreover, knowledge management contributes to the enhancement of the creation of added value for the products of organizations affiliated with the studied sector. The study also recommended that organizations need to support senior management to adopt the application of knowledge management systems due to their significant impact on improving the efficiency of the overall performance of the organizations within the studied sector. Consequently, this results in an increase in supply chain efficiency and the settlement of sector organizations' debts with other government sectors.

1. Introduction

Over the past years, knowledge management has emerged as one of the modern management concepts adopted by organizations, along with the adoption and application of its fundamental concepts and approaches. These organizations have established the foundations for knowledge management by focusing on technological, social, economic, psychological, and organizational factors. Moreover, knowledge management is becoming increasingly important in light of organizations' significant challenges. This importance is growing in light of the rise in the significance of knowledge objectives that knowledge management capacities focus on achieving, resulting in increased levels of productivity, efficiency,and impact in organizations (Novak et al., 2020).

Supply chain intelligence is believed to help twenty-first-century organizations adapt to changes in the first work environment and gain a competitive advantage in global markets. The competencies of the supply chains contribute to the enhancement of supply chain capabilities, enabling these organizations to deliver products that meet the needs and desires of their customers. The effectiveness of a supply chain consisting of a framework consisting of managerial, technological, and productive expertise is a crucial element in the formation of supply chain capabilities that can absorb demand fluctuations (Azeem, 2022). Therefore, the organizations' supply chains are responsible for numerous early failures due to inefficient expectations and outcomes resulting from a lack of behavior transfer between chain parties. The supply chains result from a failure to communicate expectations and the actions of the parties involved in the chain. In addition, knowledge is the most crucial factor for supply chain management success (Schniederjans et al., 2020).

Consequently, knowledge management within supply chains can also assist an organization in maximizing its use of resources. Therefore, knowledge management is an essential source of competitive advantage, which has increased researchers' interest in comprehending and identifying the factors influencing the transfer of knowledge between supply chain entities. Hence, it can be concluded that knowledge management and supply chains are two critical areas of research that have undergone remarkable development in recent years (Patil &kant, 2014).

Knowledge management refers to obtaining the right information and disseminating it to the right people at the right time so that they can make the most informed decisions. In addition, the current environment is in constant change, which is related to the complexity of the market and how organizations interact with suppliers and customers. The supply chain is among the most important determinants of an organization's competitiveness (Schniederjans et al., 2020).

Industrial organizations are increasingly analyzing their internal processes to determine the added value of their supply chains, which may result in numerous fluctuations along supply chains. In addition, knowledge and information have evolved into some of the most crucial production sources within these integrated relationships between internal and external parties in supply chains (Tan et al., 2015) Supply chains need more managers and leaders who are continuously developed (Ketchen et al., 2022).

Therefore, knowledge management and supply chains are essential for the organization to achieve its objectives. In today's competitive environment, the cohesion of the members of the supply chain is essential for gaining a competitive advantage in the market. In this regard, knowledge management plays an indispensable role in enhancing the supply chain's integrity, thereby improving its performance (Sorbi et al., 2017). The current research will address the theoretical framework in detail. The study includes two variables, knowledge management (independent variable) and supply chain efficiency (dependent variable).Moreover, the study aims to identify the relationship between the two variables and develop a proposed framework to demonstrate this relationship.

2.LITERATURE REVIEW

1. Knowledge Management

Based on the above-mentioned, there is a close relationship between knowledge Due to the fact that concepts do not exist independently in language, there exists a close relationship between knowledge and language. Where language is the instrument that gives life to society's concepts. As a result, we find that the culture of each nation is inherent in its language and identity; as a philosopher once stated: "The limits of my language are the limits of my world," to which we can add that "the limits of my language are the limits of my knowledge." They represent the limits of their opportunities and life experiences, which should be provided. Moreover, the production and dissemination of educational and cultural content, the protection of digital heritage, and the improvement of teaching and learning quality are essential components of knowledge societies (Ali, 2013).

There are numerous concepts, and researchers' efforts to develop a comprehensive and accurate concept of knowledge management have diverged, as there are as many individuals who understand it through its dimensions or processes or personal perspectives as there are concepts. Consequently, the researchers will present a variety of knowledge management concepts.

Gad Al-Rab (2014) defines it as "the optimal and impactive use of creative skills, innovative ideas and outstanding thinking that is reflected in the form of added value to the organization and in a way that supports and enhances its competitiveness. In contrast, Hafsiya (2013) defines it as "the optimal utilization of the information, expertise, and skills available to an organization to make decisions and solve problems to achieve improvement in performance to higher levels and achieve goals through diagnosis, generation, storage, distribution, and application of knowledge. In addition to the definition by Al-Rawashdah (2015), it is "a management that works systematically with the intellectual capital of the organization and by all available means to innovation and continuous creativity. In turn, this advances the organization and enables it to adapt to rapid changes, allowing it to achieve its goals and enhance its performance effectively and significantly.

The study of (Abdallah and Gerges, 2014) agreed with a study (Demir et al., 2023) and a study (Al-Jamous, 2013) that the dimensions of knowledge management are represented in its processes. There are four main dimensions on which the researchers will rely in this research, which are as follows:

Knowledge Generation:
This process involves the acquisition of knowledge, innovation, and the ability to comprehend and assimilate apparent knowledge, and it must be understood that this concept refers to the capacity to innovate and develop ideas and solutions as added value, in addition to obtaining new knowledge. The combination of explicit and implicit knowledge must consider this combination to generate new meanings and knowledge.

Knowledge Storage:
This process is the organizational memory of the organization, represented by knowledge found in various forms, including processes stored in electronic databases and written documents, knowledge in documented organizational procedures and processes, tacit knowledge gained from individuals, and human knowledge stored in expert systems. This process is of great importance in organizations with high turnover rates.

Knowledge sharing:
This process entails the dissemination of knowledge between different individuals at all different administrative levels. Through which the implicit knowledge is distributed in different ways, such as training and dialogue. In contrast, explicit knowledge has a vital role in disseminating available technology through documents, internal bulletins, and learning.

Application of knowledge:
It is one of the most essential knowledge management processes, as knowledge is acquired by the work that comes through practice, experience, and application. Consequently, a supportive organizational culture must be established. This requires a great deal of assistance, such as encouragement, tolerance, and the ability to learn from mistakes. Successful knowledge management ensures that knowledge is used and applied promptly, that knowledge is invested in, and that it is used to solve problems.

2. The added value of supply chains:

Rushton et al. (2022) define the added value of supply chains as "the framework used by the organization to integrate its various functions, which start from suppliers and end at the end consumer. For the flow of the organization's goods and services and related information for the purpose of efficiently managing the organization's internal operations and maximizing the value of its products and services from the point of view of its customers and owners".

In contrast, Cahyono et al. (2023) defines it as "a set of value-added activities for supply chains that connect the organization's suppliers and the organization's customers as the core unit of the supply chains is: receiving contributions from suppliers to add value and reach customers". In addition to Wiliiam (2012) definition, whereas it is "a sequence of organizations to facilitate the functions and activities of those organizations which are included in the production and delivery of the product and service where the relay with the main suppliers of raw materials began and extends in all ways up to the end customer". In addition, Ramish and Aslam (2016) define it as "involving not only manufacturers and suppliers but also carriers, contractors, warehouses, factories, retailers and customers within each organization such as the manufacturer. It represents all the tasks associated with receiving and filling out a customer's application, and these functions include but are not limited to: product development, marketing, and logistics for procurement, distribution, financing, maintenance, and customer service".

Al-Douri (2014) represents it as "an integrated system of all activities necessary to achieve desirable levels of delivery and quality services at the lowest possible costs." However Al-Barazi (2012) defines it as "a term that uses the characterization of all the overlapping elements and processes necessary to ensure the right quantity of product in the right places, at the right time of the product, and at the lowest possible cost." Additionally, Qurunflen and Tarafdar (2013) define it as "a set of conditions and methods aimed at integrating suppliers, manufacturing, warehouses, and warehouses to produce and distribute goods in the

required quantity, on-site and at the right time with a view to reducing costs within the level of service required."

3. Knowledge Management and Value Added for Supply Chains

The added value of supply chains is one of the criteria for measuring the efficiency of performance in organizations and is the production value that organizations add or share with other organizations in creating national output. They can also be defined as "factors of production returns" (Daghfous and Khawaja, 2010). The concept of value creation dates back to the neoclassical school, where it was measured based on the profitability of the invested capital compared to the costs of the resources allocated to finance it. As a result of the fact that performance in institutions has become dependent on intangible factors such as creativity, innovation, learning, and knowledge, the organization's success is currently largely contingent on its internal capacity to innovate and exploit resources (Shukla et al., 2023).

Furthermore, knowledge management processes also contribute to supporting the organization by helping it develop existing products and add new ones, thus achieving high-added value to the organization's products and services by applying knowledge management in its innovation process, . Although Innovation processes can influence an organization's productivity through several channels, this leads to improved productivity, so the organization can provide the resources it can use to expand its outputs in the same organization and sector (Bin Hammouda, 2015). knowledge is the most valuable and effective source for achieving the added value of supply chains, as it helps to increase returns, reduce costs, attract new customers, retain existing customers, create new markets, and support and strengthen relationships(Sahibzada et al., 2023). In recent years, the number of organizations pursuing a value-oriented supply chain strategy has substantially increased. This trend has been more pronounced in organizations that use advanced information technology to improve their capabilities and skills in the supply chains (Chaithanapat et al., 2022). As customer needs and expectations change rapidly, working within supply chains improves the efficiency of the organization's work, reducing process costs, accuracy in delivery times, and improving the value-added chain (Wipo, 2015).

Research Problem

The study of the knowledge management system and its role in enhancing the efficiency of supply chains is one of the most current and important topics, and the questionnaire is administered by researchers in the chemical industry. The results indicate that the sector is plagued by numerous issues, which in inefficiency in supply chains, which are as follows:

- Increase in inventory values of raw materials by more than 50%.
- The percentage of total investments in the sector increased by more than 90%. Net profit in the sector decreases by no more than 50%.
- Low production efficiency due to technological obsolescence and lack of attention to periodic and continuous maintenance operations.

Therefore, the problem of the study can be identified through the following main question:

- To what extent does the implementation of a knowledge management system affect the efficiency of supply chains?

Hypotheses

1. There is a statistically significant impact of knowledge generation on the added value of supply chains.
2. There is a statistically significant impact of knowledge storage on the added value of supply chains.
3. There is a statistically significant impact of knowledge sharing on the added value of supply chains.
4. There is a statistically significant impact of the application of knowledge on the added value of supply chains.

3. METHODOLOGY AND PROCEDURES

The public sector organizations for chemical industries in the Arab Republic of Egypt represent the study community. This sector represents the Holding Organization for Chemical Industries and its subsidiaries, consisting of 18 organizations explained. Based on the significance of the subject of the study and its problem and objectives, the researchers have targeted the category of managers and heads of departments, where the total number of organizations in the sector under study, which number (235) single.

A. Determination of the study sample:

Despite the small size of the community, the researchers relied on the sampling method to study society for two main reasons: the geographical spread of the vocabulary of society (geographical dispersion) and the lack of access to collect the vocabulary of the community due to the nature of their work in those organizations. Hence, the researchers relied on the stratified random sample, one of the probability sample types, and the relative distribution was used in the sample under study. The researchers relied on the tables of samples at a level of confidence of 95% and a permissible error in estimating %±5, where the total sample size (146) observations were distributed according to the relative distribution.

- The sample size has been calculated using the following equation (Steven, 2012):

$$n = \frac{N \times p(1-p)}{N-1 \times (d^2 \div z^2) + p(1-p)}$$

N: Population size
n: Sample size
Z: The standard score corresponding to the confidence coefficient is 95%, so the corresponding standard score is equal to 1.96.

d: The permissible error ratio is 0.05
P: The maximum availability of the properties to be studied in the study population is 0.50
By applying the law:

$$\mathrm{n} = \frac{235 \times 0.5(1-0.5)}{235-1 \times (0.05)^2 \div (1.96)^2 + 0.5(1-0.5)}$$

n = 146 singular

The following table depicts the community, sample distribution, and response ratio:

Table no. (1)Distribution of the study sample and response ratios

Category	Number	Sample	Correct responses	Response Rate%
Managers	235	146	119	%81.5

Source: Prepared by the researchers

B. Truthfulness and Consistency Parameters for Questionnaire Lists:

This stage involves verifying the validity and integrity of the list by conducting a questionnaire study of some of the vocabulary of the sample under investigation in order to test the validity of the list and reformulate some questions that were unclear regarding the sample's vocabulary. The finalized list was then distributed to the vocabulary of the sample under investigation. The researchers designed the form based on the "Likert Pentagonal" method and the conversion of the descriptive opinions of the study sample into digital data. The response to the first list was according to a weighted weight of

between 1 and 5 degrees according to what the respondent deems appropriate, as shown in the table below.

Table no. (2)Likert Pentagonal Scale Scores

Completely agree	agree	neutral	disagree	Completely disagree
5	4	3	2	1

To ensure the accuracy of the scale and its applicability, the researchers calculated the coefficients of validity and stability (Cronbach Alpha) for the questionnaire questions in each category of the study to determine the extent to which these questions can utilize in the analysis and the values of the coefficients as follows:

Table no. (3)Honesty and consistency coefficients for the category of managers

Axis Name	**Number of phrases**	**Honesty coefficient Alfa Cronbach**	**Coefficient of stability**
The Impact of Knowledge Generation on Added Value of Supply Chains	5	0.982	0.991
The Impact of Knowledge Storage on Added Value of Supply Chains	5	0.930	0.964
The Impact of Knowledge Sharing on Added Value of Supply Chains	5	0.867	0.931
The Impact of Knowledge Application on Added Value of Supply Chains	5	0.865	0.930

It is evident from the previous table that the coefficients of honesty and consistency are acceptable for all questionnaire questions, as all coefficient values (0.6) fall within the category of managers. Therefore, it can be concluded that the coefficients have a high significance level for research purposes, and they can be utilized in the analysis without excluding any of the variables under investigation.

4.RESULTS AND DISCUSSION

Using weighted mean, standard deviation, and relative importance, the following table displays the results of the descriptive statistics for the manager study category. It depicts the weighted mean value as a percentage for each of the study's categories.

Table no. (4) The arithmetic mean and not the deviation of the standard and the relative importance of the paragraphs of knowledge generation on the added value of supply chains

No.	Phrase	Mean	St. D	Coefficient of variation%	Relative importance %	Ranking
1	The organization is keen to use the available energy efficiently	4.43	0.54	12.24%	88.64%	Third
2	Joint collaboration helps integrate the supply chains ecosystem to understand customer requirements and respond quickly to them	4.43	0.54	12.24%	88.64%	Fifth
3	There is real fairness in making decisions within the organization	4.43	0.58	13.16%	88.64%	Fourth
4	High productivity rate of workers whose performance has been adjusted with specific goals	4.45	0.54	12.23%	89.09%	Second
5	Attracting and supporting competencies from human resources helps to change and innovate continuously	4.47	0.55	12.22%	89.32%	The first

With a relative importance of 89.32% and a standard deviation of 0.55, it is evident that the element (the attraction and support of competencies from human resources enable continuous change and innovation) ranked first in terms of relative importance. With a relative importance of 89.09% and a standard deviation of 0.54, this factor (high productivity rate of workers whose performance was adjusted to meet specific goals) ranked second. While in the final ranking, the element (there is real fairness in decision-making within the organization) with a relative importance of 88.64% and a standard deviation of 0.58.

Table no. (5) The arithmetic mean and not the deviation of the standard and the relative importance of the paragraphs of knowledge storage on the added value of supply chains

No.	Phrase	mean	St. D	Coefficient of variation%	Relative importance%	Ranking
1	The organization is keen to use the available energy efficiently	4.26	0.75	17.61%	85.23%	Third
2	The organization has clear mechanisms to receive complaints and suggestions from customers	4.26	0.67	15.71%	85.23%	Second
3	The resources and possibilities available are exploited by mechanisms that enable the achievement of profits and maximize the value of the organization	4.26	0.65	15.30%	85.23%	The first
4	The organization's products achieve customer satisfaction to a higher degree than those of its competitors	4.25	0.67	15.65%	85.00%	Fourth
5	Low absenteeism turnover rate for workers	4.19	0.71	16.91%	83.86%	Fifth

It is clear that in the order of relative importance, the element (the available resources and possibilities are exploited by mechanisms that enable the achievement of profits and maximize the organization's value) ranked first, with a relative importance of 85.23% and a standard deviation of 0.65. Moreover, (the organization has precise mechanisms to receive customer complaints and suggestions) ranked second with a relative importance of 85.23% and a standard deviation of 0.67. In the final ranking, the element (low turnover rate of absence of workers) had a relative importance of 83.86% and a standard deviation of 0.71%.

Table no. (6) The arithmetic mean and not the deviation of the standard and the relative importance of the paragraphs of knowledge sharing on the added value of supply chains

No.	Phrase	mean	St. D	Coefficient of variation%	Relative importance%	Ranking
1	The organization has clear mechanisms to receive complaints and suggestions from customers	4.23	0.69	16.33%	84.55%	Fourth
2	The organization's management works to support the freedom of employees to communicate among themselves to exchange ideas and share knowledge	4.14	0.87	21.11%	82.73%	Fifth
3	The organization's products achieve customer satisfaction to a higher degree than those of its competitors	4.31	0.72	16.66%	86.18%	Third
4	High productivity rate of workers whose performance has been adjusted with specific goals	4.48	0.59	13.11%	89.55%	The first
5	Low absenteeism turnover rate for workers	4.35	0.73	16.72%	87.05%	Second

It is clear that in the order of relative importance, the element (high productivity rate of workers whose performance has been adjusted by specific targets) ranked first with a relative importance of 89.55% and a standard deviation of 0.59. The element (low turnover of the absence of workers) ranked second with a relative importance of 87.05% and a standard deviation of 0.73. In the final ranking, the element (the management of the organization works to support the freedom of employees to communicate among themselves to exchange ideas and share knowledge) had a relative importance of 82.73% and a standard deviation of 0.87.

Table no. (7) The arithmetic mean and not the deviation of the standard and the relative importance of the paragraphs of the application of knowledge on the added value of supply chains

No.	Phrase	mean	St. D	Coefficient of variation%	Relative importance%	Ranking
1	The resources and possibilities available are exploited by mechanisms that enable to maximize the value of the organization and increase its market share	4.30	0.73	16.99%	85.91%	The first
2	Attention to the extent to which employees apply new knowledge when evaluating their performance	4.18	0.85	20.36%	83.64%	Third
3	The organization uses knowledge management systems to differentiate between alternatives and make the right decision	4.13	0.91	22.00%	82.50%	Fifth
4	Eliminate procedures that limit the application of knowledge and work to generate added value efficiently	4.15	0.82	19.66%	82.94%	Fourth
5	Knowledge management contributes to increasing innovations in ways and methods of work	4.19	0.90	21.35%	83.86%	Second

Testing Hypotheses

In order to be able to test the significance of the hypothesis, the researchers used simple linear regression analysis by the method of least squares in addition to testing the correlation coefficient and the total model (t), (f). The researchers examined each of the four primary hypotheses as follows:

- The first hypothesis of this study states that, "There is a statistically significant impact of knowledge generation on the added value of supply chains."

Table (8)

Test the regression coefficients and correlation results of the first major hypothesis

Independent variable	Regression coefficient	T value	Level of significance	Resolution at α=0.05	Pearson total correlation coefficient	Value of Durban Watson Dw
Knowledge Generation	0.52	16.07	0.0	Moral	0.792	1.822

Table (9) ANOVA variance analysis of the first major hypothesis

Sources of divergence	Degrees of freedom	Value of F	Level of significance	Resolution at α=0.05	Selection coefficient R2	Unexplained percentage %
Regression	1	258.3	0.0	Moral	62.7%	37.3%
Residue	154					

Dl = 1.611, Du=1.637 DW tabular values extracted from Durban Watson tables

Based on the results of the statistical analysis, it is evident that:

- The value of the significance level related to the test of correlation and regression coefficients in the hypothesis under study was less than the value of the significance level α=0.05. This result means that knowledge generation has a statistically significant impact on the added value of supply chains.
- The correlation and the sign regression coefficients' sign were positive, indicating a statistically significant correlation between knowledge generation as a component of knowledge management and added value of supply chains.
- The value of the significance level in the table for testing the significance of the ANOVA table's total model (F) was less than the significance level α=0.05. This finding means the current study results can be generalized to the society under study.
- The value of the coefficient of determination was 62.7% = r2. This result means that the changes that occur in the generation of knowledge are responsible for explaining 62.7% of the changes that occur in the the added value of supply chains, and there is a 37.3% due to the random error limit.
- The calculated Durban Watson statistical value was Dw = 1.822 in order to test the problem of self-correlation between the regression residues. The tabular value shows that the calculated value lies between the two values (Du,4-Du), indicating the absence of a complete autocorrelation problem.

Based on the previous findings, the researchers can accept the imposition in its current form and reject the imposition in the nihilistic form, where the hypothesis states that " There is a statistically significant impact of knowledge generation on the added value of supply chains."

- The second hypothesis of the study states that " There is a statistically significant impact of knowledge storage on the added value of supply chains."

Table (10) Testing the regression coefficients and correlation results of the second major hypothesis

Independent variable	Regression coefficient	T value	Level of significance	Resolution at α=0.05	Pearson total correlation coefficient	Value of Durban Watson Dw
Knowledge Storage	0.505	15.5	0.0	Moral	0.782	1.889

Table (11) ANOVA variance analysis of the second major hypothesis

Sources of divergence	Degrees of freedom	Value of F	Level of significance	Resolution at α=0.05	Selection coefficient R2	Unexplained percentage %
Regression	1	24.3	0.0	Moral	61.2%	38.8%
Residue	154					

Dl = 1.611, Du=1.637 DW tabular values extracted from Durban Watson tables

Based on the results of the statistical analysis, it is clear that:

- The value of the significance level related to the test of correlation and regression coefficients in the hypothesis under study was less than the significance level α=0.05. This result indicates a statistically significant relationship between knowledge storage and the added value of supply chains.
- The correlation and regression coefficient were both positive, indicating that there was a statistically significant correlation between knowledge storage as a component of knowledge management and the added value of supply chains.
- The value of the significance level in the table for testing the significance of the total model (F) of the ANOVA table was less than the significance level α=0.05. This finding means that imposition results can be generalized to the society under study.
- The value of the coefficient of determination was 61.2% = r 2. This result means that the changes that occur in the storage of knowledge are responsible for explaining 61.2% of the changes that occur in the generation of value-added, and 38.8% is due to the random error limit .
- The calculated Durban Watson statistical value was Dw = 1.889 in order to test the problem of self-correlation between the regression residues. The tabular value shows that the calculated value lies between the two values (Du,4-Du), indicating the absence of a complete autocorrelation problem.

Based on the previous findings, the researchers can accept the imposition in its current form and reject the imposition in the nihilistic form, where the hypothesis states, "There is a statistically significant impact of knowledge storage on the added value of supply chains."

- The third major hypothesis of the study states, "There is a statistically significant impact of knowledge sharing on the added value of supply chains."

Table (12) Test the regression coefficients and correlation results of the third major hypothesis

Independent variable	Regression coefficient	T value	Level of significance	Resolution at α=0.05	Pearson total correlation coefficient	Value of Durban Watson Dw
Knowledge Sharing	0.491	11.7	0.0	Moral	0.687	1.737

Table (13) ANOVA variance analysis of the third major hypothesis

Sources of divergence	Degrees of freedom	Value of F	Level of significance	Resolution at α=0.05	Selection coefficient R2	Unexplained percentage %
Regression	1	137.2	0.0	Moral	47.1%	52.9%
Residue	154					

Dl = 1.611, Du=1.637 DW tabular values extracted from Durban Watson tables

From the results of the statistical analysis, it is clear that:

- The value of the significance level related to the test of correlation and regression coefficients in the hypothesis under study was less than the value of the level of significance α=0.05. This result indicates that knowledge sharing has a statistically significant effect of knowledge sharing on the added value of supply chains.
- The correlation and regression coefficients were positive, indicating a statistically significant direct correlation between knowledge sharing as an element of knowledge management and added value of supply chain.
- The value of the significance level in the table for testing the significance of the total model (F) of the ANOVA table was less than the significance level α=0.05. This finding indicates that the estimated results and the imposition results can be generalized to the society under study as a whole.
- The value of the coefficient of determination was 47.1% = r2.This outcome means that changes in knowledge sharing are responsible for explaining 47.1% of the changes that occur in the generation of value-added, and 52.9% are due to the random error limit.
- The calculated Durban Watson statistical value was Dw = 1.737 in order to test the problem of self-correlation between the regression residues and by looking at the tabular value shown. It is clear to the researchers that the calculated value lies between the two values (Du,4-Du), indicating the absence of a complete problem of autocorrelation.

From the above-mentioned, the researchers can accept the imposition in its current form and reject the imposition in the nihilistic form where the hypothesis states, "There is a statistically significant impact of knowledge sharing on the added value of supply chains."

- The fourth hypothesis of the study states, "There is a statistically significant impact of the application of knowledge on the added value of supply chains."

Table (14) Test the regression coefficients and correlation results of the fourth major hypothesis

Independent variable	Regression coefficient	T value	Level of significance	Resolution at α=0.05	Pearson total correlation coefficient	Value of Durban Watson Dw
Application of knowledge	0.576	8.12	0.0	Moral	0.548	1.745

Table (15)ANOVA variance analysis of the fourth major hypothesis

Sources of divergence	Degrees of freedom	Value of F	Level of significance	Resolution at α=0.05	Selection coefficient R2	Unexplained percentage %
Regression Residue	1 154	66	0.0	Moral	30%	70%

Dl = 1.611, Du=1.637 DW tabular values extracted from Durban Watson tables

From the results of the statistical analysis, it is clear that:

- The value of the significance level related to the test of correlation and regression coefficients in the hypothesis under study was less than the value of the level of significance α=0.05. This result indicates a statistically significant impact of the application of knowledge on the added value of supply chains.
- The correlation and regression coefficient values were positive, indicating a statistically significant consequential correlation between the application of knowledge as an element of knowledge management and the added value of supply chains.
- The value of the significance level in the table for testing the significance of the total model (F) of the ANOVA table was less than the significance level α=0.05. The study findings indicate that the estimated results and the imposition results can be generalized to the society under study as a whole.
- The value of the coefficient of determination was 30% = r2. This result means that the changes that occur in the application of knowledge are responsible for explaining 30% of the changes that occur in the generation of value-added, and there is a 70% due to the random error limit.
- The calculated Durban Watson statistical value was Dw = 1.745 in order to test the problem of self-correlation between the regression residues. Based on the tabular value, the calculated value lies between the two values (Du,4-Du), indicating the absence of a complete autocorrelation problem.

From the above, the researchers can accept the imposition in its current form and reject the imposition in the nihilistic form where the hypothesis states, "There is a statistically significant impact of the application of knowledge on the added value of supply chains."

5.CONCLUSION

The study revealed that the public sector of chemical industries in Egypt is plagued by a flow in the supply chains of the sector's subsidiaries, as well as a defect in the administrative structure, financial structure, and structure of wages and workers in this sector. It was also discovered that subsidiaries in the sector under study suffer from many problems, including accumulation of stocks of raw materials at a higher rate than the total inventory, low liquidity rates,technological obsolescence of machinery and equipment, frequent breakdowns, and lack of regular periodic maintenance of production lines. Low marketing efficiency negatively affects the competitiveness of these organizations in the face of foreign organizations in the Egyptian market, such as: Chinese organizations. The study also revealed that the subsidiaries of the sector under study suffer from a lack of liquidity rates necessary to finance and maintain the technological infrastructure of these organizations. The most important factor in improving the overall performance of organizations in the studied sector was their ability to manage knowledge. This result is consistent with the findings of (Shu and Seng, 2016) as well as (Hussein, 2016). The study also found that knowledge management contributes to increasing the added value of supply chains for the products of those organizations affiliated with the sector under study.

Recommendations

Based on the findings, the study suggests that organizations must encourage senior management to adopt the use of knowledge management systems due to their significant impact on enhancing the overall performance of the sector's organizations.In addition, sector organizations' debts to other government sectors should be settled. Sufficient liquidity must be provided to support the technological infrastructure of information systems units and production lines. It is necessary to adopt human resources development programs to certify and increase the effectiveness of human resources and reorganize organizational structures in the studied sector.

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