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EVALUATING THE IMPACT OF SUPPLY CHAIN QUALITY ON SUPPLIER PERFORMANCE: A FIELD STUDY AT THE GENERAL COMPANY FOR ELECTRICAL INDUSTRIES, BAGHDAD

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Abstract. This study examined the impact of supply chain quality on supplier performance at the General Company for Electrical and Electronic Industries in Baghdad. Supply chain quality was measured through five dimensions: top management support, supplier relationships, total quality management, information integration, and continuous improvement. Supplier performance was assessed through quality, delivery, flexibility, and cost. The study adopted a descriptive-analytical approach. The population comprised 245 employees from relevant departments, from which a purposive sample of 150 employees was selected. A total of 127 valid questionnaires were collected and analyzed. Data were collected using a questionnaire whose validity and reliability were established. The overall Cronbach's alpha coefficient was 0.947. Data analysis was conducted using SPSS version 26.The findings indicated moderate levels of both supply chain quality and supplier performance, with mean scores of 3.60 and 3.51, respectively. Total quality management recorded the highest mean among supply chain quality dimensions, while cost was the highest supplier performance dimension. The results also revealed a statistically significant positive relationship between supply chain quality and supplier performance. The combined dimensions of supply chain quality significantly explained 65.9% of the variance in supplier performance. Supplier relationships emerged as the most influential dimension.The study recommends strengthening long-term strategic supplier relationships, investing in digital infrastructure and information-sharing systems, establishing a specialized supplier development unit, adopting continuous improvement practices, and implementing supplier performance evaluation systems based on measurable indicators.

Keywords: supply chain quality, supplier performance, supplier relationships, electrical and electronic industries, Iraq.

1.1Introduction

The contemporary business world is witnessing rapid and successive transformations driven by the waves of economic globalization and the Fourth Industrial Revolution. Competition is no longer between organizations as individual entities, but rather between the integrated supply chains to which these organizations belong. This has created a new reality that necessitates organizations reconsidering their administrative and operational philosophies to ensure survival and growth in an environment characterized by uncertainty, intertwined interests, and evolving customer expectations (Ngo et al., 2024).

Supply chain management has emerged as one of the most important modern management approaches, aiming to achieve horizontal and vertical integration between the various supply chains, from primary suppliers to the end consumer. The goal is to maximize added value, reduce costs, and improve responsiveness to market demands. Success in managing this chain

has become a fundamental criterion for assessing an organization's efficiency and competitiveness (Abdallah et al., 2021).

Supply Chain Quality Management (SCM) is a relatively new approach that integrates Total Quality Management (TQM) principles with supply chain management principles. This approach extends the focus on quality beyond the organization's boundaries to encompass all stakeholders involved in the flow of materials, information, and funds. This contributes to building a unified quality culture that transcends organizational boundaries and creates an integrated system capable of achieving operational excellence (Luo et al., 2023).

Suppliers occupy a strategic position within this system, as their performance forms the cornerstone of the entire supply chain's success. A supplier that adheres to quality standards, delivery schedules, responsiveness, and competitive pricing provides the receiving organization with a competitive advantage that is difficult to replicate. Conversely, supplier failures negatively impact the quality of the final product, customer satisfaction, and the organization's market reputation (Salimian et al., 2021).

Supply Chain Quality Management (SCQM) is a modern approach that combines Total Quality Management (TQM) principles with supply chain management principles. This topic is of increasing importance in the industrial sector in general, and in the electrical and electronic industries sector in particular, because this sector relies heavily on a complex network of local and international suppliers to provide it with components and raw materials with precise technical specifications, which makes quality management in the supply chain an imperative to ensure a reliable and stable flow of inputs (Salam, 2021).

This research aims to study and analyze the impact of quality in the supply chain on supplier performance at the General Company for Electrical and Electronic Industries in Baghdad, a leading company in the Iraqi industrial sector. The goal is to provide a scientific and applied framework that contributes to enhancing the company's performance and improving the efficiency of its suppliers, ultimately serving the national economy.

1.2 Statement of the problem

Iraqi industrial companies in general, and the General Company for Electrical and Electronic Industries in particular, suffer from a number of challenges related to weak integration among the links in the supply chain, fluctuating quality levels of imported inputs, and failure of some suppliers to adhere to delivery schedules. Furthermore, high rates of returns and defective goods negatively impact the efficiency of production processes and weaken the company's competitiveness in the local and regional markets.

Through the researcher's preliminary survey and interviews with several managers and department heads at the company under study, a clear deficiency emerged in the adoption of quality management philosophy within the supply chain as an integrated approach. Attention to quality is limited to the company's internal boundaries, failing to extend to suppliers and business partners. This has created a gap between the desired level of supply performance and the actual level achieved.

Despite the numerous studies addressing the relationship between quality management and supply chains in Arab and international contexts, the researcher observed a significant research gap in the Iraqi context. This gap is characterized by a scarcity of studies that combine the two variables of supply chain quality and supplier performance, particularly within the electrical and electronics industries. Most previous studies have focused on other sectors such as food and beverages, services, and air transport. This highlights the need for a scientific study that bridges this gap and provides an in-depth understanding of the reality of this relationship within the Iraqi industrial environment.

Based on the foregoing, the research problem can be formulated in the following main question: What is the impact of quality in the supply chain, with its various dimensions, on supplier performance at the General Company for Electrical and Electronic Industries in Baghdad?

The following sub-questions stem from this main question:

1. What is the level of application of the quality dimensions in the supply chain (top management support, supplier relations, total quality management, information integration, and continuous improvement) at the company under study?

2. What is the level of supplier performance in its various dimensions (quality, delivery, flexibility, and cost) at the company under study?

3.Is there a statistically significant impact of each quality dimension in the supply chain on supplier performance at the company under study?

1.3 The Importance of the Study

First: Scientific (Theoretical) Importance

• This research contributes to enriching the Arabic and Iraqi libraries with a rigorous scientific study that combines the two variables of quality in the supply chain and supplier performance, which are relatively recent variables in management thought literature.

• The research presents a comprehensive theoretical framework that clarifies the nature of the relationship between the two variables and reveals the sub-dimensions of each, thus serving as a reference for researchers and those interested in this field.

• The research fills a clear research gap related to the scarcity of studies that have addressed this relationship in the electrical and electronic industries sector in the Iraqi context.

Second: Practical (Applied) Importance

• The research presents practical results and recommendations that senior management in the company under study can utilize to develop its policies related to supplier management and improve supplier performance.

• The research contributes to identifying the strengths and weaknesses in the application of quality practices in the company's supply chain, enabling management to make informed decisions to improve performance.

• The research findings can be used to generalize the experience to other Iraqi industrial companies operating in similar sectors.

1.4 Research Objectives

Main Objective: To evaluate the impact of supply chain quality on supplier performance at the General Company for Electrical and Electronic Industries in Baghdad.

Sub-Objectives:

1. To identify the level of application of quality dimensions in the supply chain at the company under study.

2. To diagnose the level of supplier performance across its various dimensions at the company under study.

3. To reveal the nature of the relationship between supply chain quality (as an independent variable) and supplier performance (as a dependent variable).

4. To identify the most influential supply chain quality dimension on supplier performance.

5. To provide a set of scientific and practical recommendations that contribute to enhancing supplier performance at the company under study.

1.5 Research Hypotheses

First Main Hypothesis (H1): There is a statistically significant impact ($\alpha \leq 0.05$) of supply chain quality on supplier performance at the General Company for Electrical and Electronic Industries in Baghdad.

The following sub-hypotheses are derived from this:

- H1.1: There is a statistically significant effect ($\alpha \leq 0.05$) of top management support on supplier performance.
- H1.2: There is a statistically significant effect ($\alpha \leq 0.05$) of supplier relationships on supplier performance.
- H1.3: There is a statistically significant effect ($\alpha \leq 0.05$) of Total Quality Management on supplier performance.
- H1.4: There is a statistically significant effect ($\alpha \leq 0.05$) of information integration on supplier performance.
- H1.5: There is a statistically significant effect ($\alpha \leq 0.05$) of continuous improvement on supplier performance.

1.6 The terminology of the study

Supply Chain Quality Management:

Luo et al. (2023, p. 510) defines Supply Chain Quality Management as "an integrated management approach that aims to coordinate quality practices across all parties in the supply chain, through building long-term collaborative relationships with suppliers and achieving information and process integration to enhance the quality of final outputs and achieve customer satisfaction." Operationally: the set of practices and policies adopted by the General Company for Electrical and Electronic Industries in Baghdad to ensure the quality of material and information flows between the links in the supply chain, and it is measured by the following dimensions: top management support, supplier relationships, total quality management, information integration, and continuous improvement.

Top Management Support:

Abdallah et al. (2021, p. 790) defines Top Management Support as "the commitment and support shown by top management to adopt the quality philosophy in the supply chain by providing resources, formulating the vision, and establishing supportive policies." Operationally: the degree of commitment of the company's management leadership. The study focuses on providing material and moral support for implementing quality practices in the supply chain.

Supplier Relationship:

Salimian et al. (2021, p. 945) define Supplier Relationship as "a long-term strategic relationship based on mutual trust and the exchange of information and benefits between the organization and its suppliers to achieve common goals." Operationally: It examines the nature of the existing transactions between the company under study and its suppliers, and the strength of the contractual and cooperative relationships between them.

- **Total Quality Management (TQM):**

Emon et al. (2024, p. 2018) defines Total Quality Management (TQM) as "a comprehensive management philosophy that seeks to achieve excellence in all aspects of the organization through the involvement of all employees, customer focus, and continuous improvement."

Operationally: the degree to which TQM principles are applied in the various activities of the company under study.

Information Integration:

• Ngo et al. (2024, p. 843) defines Information Integration as "the ability of parties in the supply chain to exchange accurate and timely information using advanced information and communication technologies." Operationally: the effectiveness of the information exchange systems used by the company under study with its suppliers. Continuous Improvement:

•Salam (2021, p. 1700) defines Information Integration as "the systematic and continuous effort to improve processes, products, and services through gradual or radical modifications." Operationally: the efforts undertaken by the company under study to continuously develop its supply processes and practices.

Suppliers Performance:

•Salam (2021, p. 1702) defines Suppliers Performance as "the level achieved by the supplier in meeting the requirements of the receiving organization in terms of quality, delivery, flexibility, and cost, and the extent of its contribution to achieving supply chain objectives." Operationally: the actual performance level achieved by the company's suppliers under study, measured by the dimensions of quality, delivery, flexibility, and cost.

1.7 Research delimitations

- **Thematic** delimitations**:** The study is limited to examining the impact of supply chain quality, in terms of its dimensions of top management support, supplier relationships, total quality management, information integration, and continuous improvement, on supplier performance, in terms of its dimensions of quality, delivery, flexibility, and cost.
- **Geographical** delimitations**:** The study is conducted at the State Company for Electrical and Electronic Industries in Baghdad, Republic of Iraq.
- **Human** delimitations**:** The study includes managers, department heads, engineers, and supervisors working in the quality, production, procurement, and warehousing departments of the company under investigation.
- **Temporal** delimitations**:** The study was conducted during the year 2026.

1.8 Theoretical Framework

The Concept of Quality in the Supply Chain

The concept of quality management in the supply chain is one of the most recent management concepts that emerged at the beginning of the third millennium in response to the radical transformations witnessed by the business environment, specifically in light of the growing reliance on global supply networks and their increasing complexity. This concept emerged from the integration of two important management philosophies: Total Quality Management (TQM), which focuses on excellence in the organization's internal processes, and Supply Chain Management (SCM), which focuses on the integration of different supply chain links. This integration produces a new approach where quality extends beyond the organization's boundaries to encompass all parties involved in the value chain.

Abdallah et al. (2021) indicate that quality management in the supply chain represents a paradigm shift in management thinking. Quality is no longer an internal responsibility limited to production and control departments, but rather a collective responsibility shared by all parties in the chain, from primary suppliers through manufacturers and distributors to the end consumer.



The Importance of Quality in the Supply Chain

The importance of quality management in the supply chain is evident in several strategic and operational aspects. It contributes to reducing costs resulting from errors, rework, and returns. It also enhances the organization's ability to respond quickly to market changes and customer demands. Furthermore, it plays a role in building long-term strategic relationships with suppliers, contributing to operational excellence and collaborative innovation (Luo et al., 2023).This philosophy also enables the organization to obtain high-quality and reliable inputs, which positively impacts the quality of the final product and customer satisfaction, and strengthens the organization's competitive advantage in the market (Salimian et al., 2021).

Dimensions of Quality in the Supply Chain

In this research, the researcher adopted five main dimensions for measuring quality in the supply chain, based on a review of relevant literature. These dimensions are as follows:

A. Top Management Support: Top management support is the cornerstone of any effort to implement a quality philosophy in the supply chain. Top management is responsible for formulating the organization's vision, mission, and overall strategy, providing the necessary material and human resources, and fostering an organizational culture that supports change. Abdallah et al. (2021) indicate that the absence of leadership commitment is one of the most important reasons for the failure of quality initiatives in supply chains.

B. Supplier Relationships: Strategic supplier relationships are a modern approach in supply chain management. They are based on the principle of partnership rather than short-term exchange deals. Relationships are built on mutual trust, information sharing, and the sharing of risks and benefits, which contributes significantly to improving supply chain performance (Emon et al., 2024).

C. Total Quality Management (TQM): TQM represents the guiding philosophy for quality management in the supply chain. It is based on the principles of customer focus, effective leadership, employee engagement, a process approach, continuous improvement, evidence-based decision-making, and stakeholder relationship management (Salimian et al., 2021).

D. Information Integration: Information integration is the lifeblood of the modern supply chain. It enables the timely and accurate flow of information among all parties, reducing the bullwhip effect and improving the accuracy of forecasts and inventory decisions. Advances in information technologies, particularly the Internet of Things (IoT), artificial intelligence (AI), and blockchain, have enhanced information integration capabilities among supply chain partners (Ngo et al., 2024).

E. Continuous improvement: Continuous improvement expresses the organized and continuous effort to develop processes, products and services, whether through incremental improvements in the Kaizen style or through radical improvements in the business process reengineering style. It requires an organizational culture that encourages innovation, learning from mistakes and rewards individual and collective initiatives (Salam, 2021).

The Concept of Supplier Performance

Supplier performance is a fundamental concept in supply chain management literature. It refers to the level at which a supplier meets the requirements of the receiving organization according to predefined criteria. The concept of supplier performance has evolved over the years. Initially limited to price, it then expanded to include quality and delivery criteria, and in recent decades, it has broadened to encompass deeper strategic dimensions such as flexibility, innovation, and sustainability (Salam, 2021).

The Importance of Evaluating Supplier Performance

Evaluating supplier performance is of paramount importance for several reasons. It allows the organization to identify and retain competent suppliers, uncover underperforming suppliers and make appropriate decisions regarding them, provide an objective information base for purchasing and contract awarding decisions, and motivate suppliers to improve their performance through constructive competition (Luo et al., 2023).

Dimensions of Supplier Performance

The researcher adopted four main dimensions to measure supplier performance, as follows:

a. Quality: This refers to the extent to which supplied inputs conform to agreed-upon technical specifications and standards. It is measured by several indicators, such as the defect rate, return rate, and complaint rate (Salimian et al., 2021).

B. Delivery: This refers to the supplier's ability to adhere to agreed-upon delivery dates in terms of time, quantity, and location. It is a crucial criterion in evaluating supply performance (Abdallah et al., 2021).

C. Flexibility: This refers to the supplier's ability to respond to sudden changes in the receiving organization's requirements, whether in terms of quantities, specifications, or delivery dates (Ngo et al., 2024).

D. Cost: This refers to the supplier's competitiveness in terms of the prices offered and the total costs of supply, including transportation, storage, and inspection costs (Emon et al., 2024).

1.9 Previous Studies

Study by Al-Nuaimat and Al-Zoubi (2023): The study aimed to identify the effect of supplier management strategies on supply chain performance at ABB Asea Brown Boveri. The study adopted the descriptive-analytical approach and included a sample of 150 employees from the company. The findings revealed a statistically significant effect of supplier management strategies on supply chain performance. The study recommended strengthening strategic relationships with suppliers and developing systems for periodically evaluating supplier performance.

Study by Abdulaziz (2024): The study aimed to examine the moderating role of supplier performance development in the relationship between supply chain fraud and structural gaps in the plastic manufacturing sector. The study adopted the descriptive-analytical approach and included a sample of 210 managers from plastic manufacturing companies. The findings indicated a statistically significant moderating role of supplier performance development. The study recommended adopting integrated programs to develop suppliers' capabilities and reduce fraudulent practices.

Study by Bin Abdulaziz and Mahmoud (2023): The study aimed to investigate the effect of technology on the quality of supply services at the Ministry of Education in the Kingdom of Saudi Arabia. The study adopted the descriptive-analytical approach and included a sample of 250 employees from the Ministry. The findings showed a statistically significant effect of technology on improving the quality of supply services. The study recommended increasing investment in modern technologies to improve supply services.

Study by Wahban and Al-Mahasneh (2024): The study aimed to investigate the effect of total quality management practices on supply chain performance, with electronic supply chains serving as a mediating variable, in industrial organizations listed on the Amman Stock Exchange in Jordan. The study adopted the descriptive-analytical approach and included a sample of 320 managers from industrial organizations. The findings indicated a statistically significant effect of total quality management practices on supply chain performance, with

electronic supply chains playing a mediating role. The study recommended adopting total quality management practices and activating electronic supply chains.

Study by Al-Anani and Abu Rumman (2024): The study aimed to examine the effect of total quality management practices on service quality, with supply chain management serving as a mediating variable, at Royal Jordanian Airlines. The study adopted the descriptive-analytical approach and included a sample of 200 employees from the company. The findings showed a statistically significant effect of total quality management practices on service quality, with supply chain management acting as a mediating variable. The study recommended integrating total quality management practices with supply chain management.

Study by Al-Qaaida and Al-Shaar (2023): The study aimed to examine the effect of total quality management practices on the quality of work life in private hospitals in Jordan. The study adopted the descriptive-analytical approach and included a sample of 270 employees from private hospitals. The findings revealed a statistically significant effect of total quality management practices on the quality of work life. The study recommended strengthening the implementation of total quality management practices to improve the quality of work life.

Study by Abdallah et al. (2021): The study aimed to investigate the effect of supply chain quality management on supply chain performance through the indirect roles of supply chain agility and innovation. The study adopted the descriptive-analytical approach and included a sample of 294 industrial companies in Jordan. The findings demonstrated a statistically significant effect of supply chain quality management on supply chain performance. The study recommended strengthening supply chain agility and innovation capabilities.

Study by Ngo et al. (2024): The study aimed to examine sustainability-related supply chain risks and supply chain performance, with dynamic supply chain management practices serving as a moderating variable. The study adopted the descriptive-analytical approach and included a sample of 312 managers from industrial companies. The findings indicated a statistically significant moderating role of dynamic supply chain management practices. The study recommended adopting dynamic practices to address sustainability-related risks.

Study by Salimian et al. (2021): The study aimed to examine the effect of supplier quality management on performance, with supply chain-oriented culture serving as a mediating variable. The study adopted the descriptive-analytical approach and included a sample of 243 industrial companies. The findings showed a statistically significant effect of supplier quality management on performance, with organizational culture playing a mediating role. The study recommended developing an organizational culture oriented toward supply chain management.

Study by Luo et al. (2023): The study aimed to investigate the effect of supply chain quality leadership on supply chain quality integration and quality performance. The study adopted the descriptive-analytical approach and included a sample of 206 industrial companies in China. The findings revealed a statistically significant effect of quality leadership on quality integration and quality performance. The study recommended strengthening the role of leadership in managing quality across the supply chain.

Study by Emon et al. (2024): The study aimed to examine the effect of supplier relationship management on supply chain performance in the manufacturing and service sectors in Bangladesh. The study adopted the descriptive-analytical approach and included a sample of 280 managers. The findings revealed a statistically significant effect of supplier relationship management on supply chain performance. The study recommended developing effective strategies for managing supplier relationships.

Distinction of the Current Study from Previous Studies

The current study differs from previous studies in that it is among the first studies to examine the effect of supply chain quality on supplier performance in the Iraqi industrial context, specifically within the electrical and electronic industries sector. In addition, the study adopts an integrated set of dimensions covering managerial, relational, informational, and improvement aspects. This approach contributes to providing a comprehensive and in-depth understanding of the relationship between supply chain quality and supplier performance within the Iraqi context.

2. Research Methodology and Procedures

The researcher adopted the Descriptive Analytical Method as the most appropriate method for the nature and objectives of the study. This method describes the phenomenon under investigation as it exists in reality and then analyzes the collected data quantitatively to identify relationships and differences among the study variables. It also facilitates the interpretation of these relationships and contributes to developing an objective understanding of the phenomenon and reaching evidence-based conclusions.

2.1 Study Population

The study population consisted of all employees working at the administrative, technical, and supervisory levels of the General Company for Electrical and Electronic Industries in Baghdad. The study focused specifically on employees working in departments directly related to the subject of the study, namely the Quality and Quality Control Department, Production Department, Purchasing Department, Warehouses and Supplies Department, and Planning and Follow-up Department.

According to the official records of the company's Human Resources Department for 2025, the total study population consisted of 245 employees.

2.2 Study Sample

Given the nature of the study, which required obtaining the opinions of employees who possess relevant expertise and sufficient knowledge of the study topic, the researcher employed purposive sampling. This sampling technique was used to select participants who were considered most capable of providing accurate responses reflecting the actual implementation of supply chain quality practices and supplier performance in the company under investigation.

The sample size was determined using Steven Thompson's formula for calculating the sample size for a finite population. Based on a study population of 245 employees, a 95% confidence level, and a 5% margin of error, the minimum required sample size was 150 employees. The researcher distributed 150 questionnaires to the targeted participants. A total of 135 questionnaires were returned, representing an overall response rate of 90%. Following examination and verification of the returned questionnaires, eight questionnaires were excluded because their responses were incomplete or because they showed a uniform response pattern indicating a lack of seriousness in completing the questionnaire. Consequently, 127 questionnaires were considered valid for statistical analysis, representing a valid response rate of 84.7%. This response rate is considered high and statistically acceptable and indicates the cooperation of the participants and the seriousness of their responses.

2.3 Study Instrument

The researcher used a questionnaire as the main instrument for collecting primary data from the study sample. The questionnaire was considered appropriate for the nature of the study and the size of its sample because it allows the researcher to collect a relatively large amount of data within a short period and at a relatively low cost.The questionnaire consisted of 45

items in its final form. The items were distributed across the dimensions of the independent and dependent variables as presented in Table 3.

Table 3 Distribution of Questionnaire Items across the Study Dimensions

No.	Variable	Dimension	Number of Items	Item Numbers
1	Supply Chain Quality	Top Management Support	5	1–5
2	Supply Chain Quality	Relationship with Suppliers	5	6–10
3	Supply Chain Quality	Total Quality Management	5	11–15
4	Supply Chain Quality	Information Integration	5	16–20
5	Supply Chain Quality	Continuous Improvement	5	21–25
6	Supplier Performance	Quality	5	26–30
7	Supplier Performance	Delivery	5	31–35
8	Supplier Performance	Flexibility	5	36–40
9	Supplier Performance	Cost	5	41–45
	Total		**45**	

The researcher employed a five-point Likert scale to measure participants' responses to the questionnaire items. This scale is widely used in administrative and organizational research because it allows respondents to express their degree of agreement with each statement along a continuum.The response categories were organized from 1 to 5, with higher scores indicating a higher level of agreement with the questionnaire statement. To interpret the arithmetic means and determine the level of each dimension, the researcher calculated the category length using the following formula:

Category Length = (5 − 1) / 3 = 1.33

Accordingly, the arithmetic means were interpreted according to three levels: low, moderate, and high.

Validity and Reliability of the Study Instrument

Validity of the Study Instrument

A. Face Validity

The questionnaire, in its preliminary form, was presented to a panel of 10 specialists in Business Administration, Operations Management, and Supply Chain Management from a number of Iraqi universities, including the University of Baghdad, Al-Mustansiriyah University, Al-Nahrain University, and the University of Karbala. The experts were asked to evaluate the clarity of the questionnaire items, the appropriateness of their linguistic formulation, the extent to which each item belonged to the dimension it was intended to measure, and the

comprehensiveness of the questionnaire in covering the dimensions of the study.An agreement rate of 80% or higher was adopted as the criterion for retaining an item. The questionnaire was revised in light of the experts' comments. Accordingly, the wording of six items was modified, two items were deleted, and one item was added.

B. Internal Consistency Validity

Internal consistency validity was assessed by calculating Pearson correlation coefficients between the score of each item and the total score of the dimension to which the item belonged. The analysis was conducted using a pilot sample of 30 participants. The results are presented in Table 6.

Table 6 Pearson Correlation Coefficients between the Items of Each Dimension and the Total Dimension Score

Dimension	Range of Correlation Coefficients	Significance Level
Top Management Support	0.687–0.812	0.000**
Relationship with Suppliers	0.712–0.847	0.000**
Total Quality Management	0.698–0.836	0.000**
Information Integration	0.674–0.821	0.000**
Continuous Improvement	0.702–0.829	0.000**
Quality	0.681–0.798	0.000**
Delivery	0.694–0.813	0.000**
Flexibility	0.612–0.784	0.000**
Cost	0.665–0.792	0.000**

Note. Correlation is statistically significant at α ≤ 0.01.

As shown in Table 6, all correlation coefficients between the individual items and the total score of their respective dimensions were statistically significant at α ≤ 0.01. The coefficients ranged from 0.612 to 0.847. These values indicate strong relationships between the individual items and their respective dimensions and provide evidence of a high level of internal consistency in the study instrument.

C. Construct Validity

Construct validity was assessed by calculating Pearson correlation coefficients between the score of each dimension and the total score of the variable to which the dimension belonged. The results are presented in Table 7.

Table 7 Pearson Correlation Coefficients between Each Dimension and the Total Score of Its Variable

Variable	Dimension	Correlation Coefficient	Significance Level
Supply Chain Quality	Top Management Support	0.812	0.000**
Supply Chain Quality	Relationship with Suppliers	0.847	0.000**
Supply Chain Quality	Total Quality Management	0.836	0.000**

Supply Chain Quality	Information Integration	0.798	0.000**
Supply Chain Quality	Continuous Improvement	0.821	0.000**
Supplier Performance	Quality	0.824	0.000**
Supplier Performance	Delivery	0.847	0.000**
Supplier Performance	Flexibility	0.812	0.000**
Supplier Performance	Cost	0.798	0.000**

Note. Correlation is statistically significant at α ≤ 0.01.

Table 7 shows that all correlation coefficients between the individual dimensions and the total score of their respective variables were statistically significant at α ≤ 0.01. The coefficients ranged from 0.798 to 0.847. These relatively high correlation coefficients indicate strong associations between the dimensions and their corresponding overall variables and provide evidence that the questionnaire demonstrates a high level of construct validity.

Reliability of the Study Instrument

Reliability refers to the extent to which a research instrument produces consistent results when it is administered to the same sample under similar conditions. To assess the reliability of the study instrument, the researcher used Cronbach's Alpha coefficient. This coefficient is widely used in administrative and social science research to assess the internal consistency of questionnaire items. According to Nunnally (1978), a Cronbach's Alpha coefficient of 0.70 or higher is generally considered an acceptable level of reliability.

Table 8 Cronbach's Alpha Coefficients for the Study Dimensions and the Overall Instrument

No.	Dimension	Number of Items	Cronbach's Alpha
1	Top Management Support	5	0.842
2	Relationship with Suppliers	5	0.876
3	Total Quality Management	5	0.891
4	Information Integration	5	0.858
5	Continuous Improvement	5	0.869
	Supply Chain Quality (Overall)	**25**	**0.923**
6	Quality	5	0.831
7	Delivery	5	0.854
8	Flexibility	5	0.847
9	Cost	5	0.826
	Supplier Performance (Overall)	**20**	**0.912**
	Overall Instrument	**45**	**0.947**

Table 8 shows that the Cronbach's Alpha coefficients for the individual dimensions ranged from 0.826 to 0.891. The coefficient for the independent variable, Supply Chain Quality, was 0.923, while the coefficient for the dependent variable, Supplier Performance, was 0.912. The Cronbach's Alpha coefficient for the questionnaire as a whole was 0.947.All coefficients exceeded the minimum acceptable value of 0.70. These results indicate a high level of internal consistency among the questionnaire items and provide evidence that the study instrument has a high level of reliability. Therefore, the instrument was considered reliable and suitable for collecting the data required for the study.

Statistical Methods Used

The researcher used the Statistical Package for the Social Sciences (SPSS), Version 26, to analyze the collected data. A set of statistical methods was employed according to the nature of the study, its variables, and its research objectives. The statistical procedures were as follows:

- Frequencies and Percentages: These were used to describe the demographic characteristics of the study participants.
- Means: These were used to determine the level of respondents' responses to the questionnaire items and the study dimensions.
- Standard Deviations: These were used to measure the degree of dispersion of participants' responses around their arithmetic means.
- Cronbach's Alpha: This was used to assess the reliability of the study instrument and the internal consistency of its items.
- Simple Linear Regression Analysis: This was used to test the study's sub-hypotheses and determine the effect of each dimension of the independent variable on the dependent variable.
- Multiple Linear Regression Analysis: This was used to test the main hypothesis of the study and determine the combined effect of the dimensions of the independent variable on the dependent variable.
- Analysis of Variance (ANOVA): This was used to assess the statistical significance of the regression models.
- T-test: This was used to test the statistical significance of the regression coefficients and determine whether the estimated effects of the independent variables on the dependent variable were statistically significant.

Demographic Data Analysis of the Study Sample

This section presents the distribution of the study sample according to the demographic variables of gender, age, educational qualification, years of service, and job title. Frequencies and percentages were calculated to describe the characteristics of the study participants.

Distribution of the Study Sample According to Gender

Table 1 Distribution of the Study Sample According to Gender

Gender	Frequency	Percentage
Male	98	77.2%
Female	29	22.8%
Total	127	100%

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As shown in Table 1, males represented 77.2% of the study sample, with 98 participants, whereas females represented 22.8%, with 29 participants. The researcher attributes this distribution to the nature of the industrial sector in Iraq, which employs a higher proportion of male workers, particularly in technical, engineering, and supervisory positions within the company under investigation.

Distribution of the Study Sample According to Age

Table 2 Distribution of the Study Sample According to Age

Age Group	Frequency	Percentage
Less than 30 years	18	14.2%
30–less than 40 years	42	33.1%
40–less than 50 years	45	35.4%
50 years and above	22	17.3%
Total	127	100%

Table 2 shows that the 40–less than 50 years age group ranked first, accounting for 35.4% of the sample. It was followed by the 30–less than 40 years group, which accounted for 33.1%. The 50 years and above group represented 17.3%, while the less than 30 years group represented 14.2%.

This distribution indicates that most participants belonged to the middle-age groups. These participants are likely to have sufficient practical experience to evaluate supply chain quality practices and supplier performance based on their experience within the company.

Distribution of the Study Sample According to Educational Qualification

Table 3 Distribution of the Study Sample According to Educational Qualification

Educational Qualification	Frequency	Percentage
Diploma	15	11.8%
Bachelor's degree	78	61.4%
Master's degree	26	20.5%
Doctoral degree	8	6.3%
Total	127	100%

As indicated in Table 3, participants holding a bachelor's degree constituted the largest proportion of the study sample, accounting for 61.4%. They were followed by participants holding a master's degree at 20.5%, those holding a diploma at 11.8%, and those holding a doctoral degree at 6.3%.

The distribution indicates a relatively high educational level among the participants. A total of 88.2% of the sample held a bachelor's degree or a postgraduate qualification. This level of educational attainment supports the participants' ability to understand the questionnaire items and provide informed responses concerning supply chain quality and supplier performance.

Distribution of the Study Sample According to Years of Service

Table 4 Distribution of the Study Sample According to Years of Service

Years of Service	Frequency	Percentage
Less than 5 years	14	11.0%
5–less than 10 years	35	27.6%
10–less than 15 years	41	32.3%
15 years and above	37	29.1%
Total	127	100%

Table 4 shows that 89.0% of the participants had more than five years of work experience, while 61.4% had more than ten years of experience. This distribution indicates that most participants had substantial practical experience. Such experience enables them to provide informed responses that reflect the actual practices of supply chain quality and supplier performance within the company under investigation.

Distribution of the Study Sample According to Job Title

Table 5 Distribution of the Study Sample According to Job Title

Job Title	Frequency	Percentage
Manager	12	9.4%
Department Head	28	22.1%
Engineer	62	48.8%
Supervisor	25	19.7%
Total	127	100%

Table 5 shows that engineers constituted the largest proportion of the study sample, accounting for 48.8% with 62 participants. They were followed by department heads, who represented 22.1%, supervisors at 19.7%, and managers at 9.4%. This distribution indicates that the sample represents different managerial, technical, and supervisory levels within the company under investigation. The inclusion of participants from different job positions strengthens the breadth of the sample and supports the objectivity of the findings.

Descriptive Analysis of the Independent Variable: Supply Chain Quality Top Management Support Dimension

Table 7 Means and Standard Deviations of the Items Measuring Top Management Support

No.	Item	Mean	Standard Deviation	Level	Rank
1	The company's top management demonstrates a clear commitment to implementing supply chain quality practices.	3.76	0.812	High	2
2	Top management provides the financial and human resources required to implement quality practices.	3.62	0.874	Moderate	4

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3	Top management establishes a clear vision for quality management in the supply chain.	3.81	0.769	High	1
4	Top management encourages employees to adopt a quality culture.	3.58	0.891	Moderate	5
5	Top management periodically reviews the performance of quality practices in the supply chain.	3.65	0.856	Moderate	3
	Overall Dimension Mean	**3.68**	**0.712**	**High**	**—**

Table 7 shows that the overall mean for the Top Management Support dimension was 3.68, with a standard deviation of 0.712, indicating a high level. The item means ranged from 3.58 to 3.81.Item 3, which states that top management establishes a clear vision for quality management in the supply chain, ranked first with a mean of 3.81 and a standard deviation of 0.769. Item 4, concerning top management's encouragement of employees to adopt a quality culture, ranked last with a mean of 3.58 and a standard deviation of 0.891. These results indicate that participants perceive top management as providing a relatively strong level of support for supply chain quality. However, the comparatively lower score for encouraging employees to adopt a quality culture suggests an area that could receive greater organizational attention.

Relationship with Suppliers Dimension

Table 8 Means and Standard Deviations of the Items Measuring Relationship with Suppliers

No.	Item	Mean	Standard Deviation	Level	Rank
1	The company seeks to establish long-term strategic relationships with suppliers.	3.61	0.834	Moderate	3
2	The company adopts the principle of partnership with suppliers rather than relying on short-term transactions.	3.47	0.912	Moderate	5
3	The company regularly exchanges technical and operational information with its suppliers.	3.52	0.867	Moderate	4
4	The company involves its suppliers in product development processes.	3.68	0.798	High	1
5	The company assists its suppliers in developing their technical and managerial capabilities.	3.63	0.847	Moderate	2
	Overall Dimension Mean	**3.54**	**0.783**	**Moderate**	**—**

As shown in Table 8, the overall mean for the Relationship with Suppliers dimension was 3.54, with a standard deviation of 0.783, indicating a moderate level. The item means ranged from 3.47 to 3.68.Item 4, concerning the company's involvement of suppliers in product development processes, ranked first with a mean of 3.68 and a standard deviation of 0.798. Item 2, concerning the adoption of supplier partnerships instead of short-term transactions, ranked last with a mean of 3.47 and a standard deviation of 0.912.The results indicate that the company maintains a moderate level of supplier relationship practices. Supplier involvement in product development received the highest rating, while the partnership-based

approach to supplier relationships received the lowest rating. This suggests that strengthening long-term partnership practices may contribute to improving the quality of relationships between the company and its suppliers.

Total Quality Management Dimension

Table 9 Means and Standard Deviations of the Items Measuring Total Quality Management

No.	Item	Mean	Standard Deviation	Level	Rank
1	The company adopts the philosophy of total quality management across all its activities.	3.79	0.756	High	2
2	The company applies international quality standards, such as ISO 9001, in its operations.	3.85	0.712	High	1
3	The company adopts a customer-focused approach in all its decisions.	3.68	0.821	High	3
4	The company involves all employees in quality improvement efforts.	3.57	0.867	Moderate	5
5	The company relies on data and facts when making quality-related decisions.	3.71	0.798	High	4
	Overall Dimension Mean	**3.72**	**0.694**	**High**	**—**

Table 9 indicates that the overall mean for the Total Quality Management dimension was 3.72, with a standard deviation of 0.694, indicating a high level. The item means ranged from 3.57 to 3.85. Item 2, which concerns the application of international quality standards such as ISO 9001, ranked first with a mean of 3.85 and a standard deviation of 0.712. Item 4, concerning employee involvement in quality improvement efforts, ranked last with a mean of 3.57 and a standard deviation of 0.867. The findings indicate that Total Quality Management practices are implemented at a relatively high level within the company. The highest rating was associated with the application of international quality standards, suggesting that formal quality standards represent an important component of the company's quality practices. The lower rating for employee involvement indicates that greater participation of employees in quality improvement activities could strengthen the implementation of Total Quality Management.

Information Integration Dimension

Table 10 Means and Standard Deviations of the Items Measuring Information Integration

No.	Item	Mean	Standard Deviation	Level	Rank
1	The company uses integrated information systems to manage the supply chain.	3.42	0.891	Moderate	3
2	The company exchanges electronic data with its suppliers in real time.	3.28	0.943	Moderate	5
3	The company uses modern technologies to track the flow of materials and information.	3.36	0.912	Moderate	4

4	The company's information systems are characterized by accuracy and reliability.	3.51	0.847	Moderate	1
5	The company provides its suppliers with access to supply-related information.	3.48	0.869	Moderate	2
	Overall Dimension Mean	**3.41**	**0.826**	**Moderate**	**—**

Table 10 shows that the overall mean for the Information Integration dimension was 3.41, with a standard deviation of 0.826, indicating a moderate level. The item means ranged from 3.28 to 3.51. Item 4, concerning the accuracy and reliability of the company's information systems, ranked first with a mean of 3.51 and a standard deviation of 0.847. Item 2, concerning the real-time electronic exchange of data with suppliers, ranked last with a mean of 3.28 and a standard deviation of 0.943.These findings indicate that information integration practices exist at a moderate level. The relatively high rating for the accuracy and reliability of information systems suggests that the company has a reasonable information infrastructure. However, the lower rating for real-time electronic data exchange indicates a need to strengthen digital communication and information-sharing mechanisms with suppliers.

Continuous Improvement Dimension

Table 11 Means and Standard Deviations of the Items Measuring Continuous Improvement

No.	Item	Mean	Standard Deviation	Level	Rank
1	The company adopts a continuous improvement approach in all its operations.	3.67	0.812	Moderate	3
2	The company uses statistical tools to identify opportunities for improvement.	3.54	0.876	Moderate	5
3	The company encourages employees to provide suggestions for improving operations.	3.71	0.789	High	2
4	The company applies modern methodologies such as Six Sigma and Kaizen.	3.58	0.847	Moderate	4
5	The company works with its suppliers to continuously improve the quality of inputs.	3.65	0.821	Moderate	1
	Overall Dimension Mean	**3.63**	**0.748**	**Moderate**	**—**

Table 11 indicates that the overall mean for the Continuous Improvement dimension was 3.63, with a standard deviation of 0.748, indicating a moderate level. The item means ranged from 3.54 to 3.71. Item 3, concerning encouraging employees to provide suggestions for improving operations, ranked first according to the original ranking presented in the data, with a mean of 3.71 and a standard deviation of 0.789. Item 2, concerning the use of statistical tools to identify improvement opportunities, ranked last with a mean of 3.54 and a standard deviation of 0.876. The findings indicate that continuous improvement practices are implemented at a moderate level. Employee suggestions represent a relatively strong aspect of continuous improvement, whereas the use of statistical tools to identify improvement opportunities

received the lowest rating. This suggests that greater use of systematic and data-based improvement techniques could strengthen continuous improvement practices within the company.

Second: Descriptive Analysis of the Dependent Variable: Supplier Performance :Quality Dimension

Table 13 Means and Standard Deviations of the Items Measuring Quality

No.	Item	Mean	Standard Deviation	Level	Rank
1	The company's suppliers comply with the agreed technical specifications.	3.62	0.798	Moderate	3
2	The supplied materials have a low defect rate.	3.51	0.867	Moderate	5
3	Suppliers hold accredited quality certifications such as ISO certification.	3.68	0.812	High	1
4	Suppliers respond promptly to quality-related comments.	3.54	0.854	Moderate	4
5	The rate of returns of supplied materials is low.	3.56	0.836	Moderate	2
	Overall Dimension Mean	**3.58**	**0.731**	**Moderate**	**—**

Table 13 shows that the overall mean for the Quality dimension was 3.58, with a standard deviation of 0.731, indicating a moderate level. The item means ranged from 3.51 to 3.68. Item 3, concerning suppliers' possession of accredited quality certifications such as ISO certification, ranked first with a mean of 3.68 and a standard deviation of 0.812. Item 2, concerning the low defect rate of supplied materials, ranked last with a mean of 3.51 and a standard deviation of 0.867. The findings indicate that supplier quality performance is at a moderate level. The relatively high rating for accredited quality certifications suggests that quality certification represents an important aspect of supplier evaluation. However, the lower rating for defect rates indicates that greater attention may be required to reduce defects in supplied materials.

Delivery Dimension

Table 14 Means and Standard Deviations of the Items Measuring Delivery

No.	Item	Mean	Standard Deviation	Level	Rank
1	Suppliers comply with the agreed delivery schedules.	3.45	0.892	Moderate	3
2	Suppliers deliver the required quantities accurately.	3.51	0.867	Moderate	2
3	Cases of delivery delays are low.	3.38	0.921	Moderate	4
4	Suppliers possess advanced logistics capabilities.	3.34	0.936	Moderate	5
5	Suppliers provide accurate information about shipment status.	3.67	0.812	Moderate	1
	Overall Dimension Mean	**3.47**	**0.798**	**Moderate**	**—**

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Table 14 indicates that the overall mean for the Delivery dimension was 3.47, with a standard deviation of 0.798, indicating a moderate level. The item means ranged from 3.34 to 3.67. Item 5, concerning suppliers' provision of accurate information about shipment status, ranked first with a mean of 3.67 and a standard deviation of 0.812. Item 4, concerning suppliers' advanced logistics capabilities, ranked last with a mean of 3.34 and a standard deviation of 0.936.These findings indicate that supplier delivery performance is moderate. The highest rating for shipment-status information suggests that communication regarding deliveries is relatively stronger than other delivery practices. The lower rating for logistics capabilities indicates an area where supplier performance could be strengthened.

Flexibility Dimension

Table 15 Means and Standard Deviations of the Items Measuring Flexibility

No.	Item	Mean	Standard Deviation	Level	Rank
1	Suppliers respond to sudden changes in the required quantities.	3.28	0.947	Moderate	4
2	Suppliers are flexible in adjusting delivery schedules.	3.35	0.912	Moderate	3
3	Suppliers are able to meet customized specification requirements.	3.42	0.878	Moderate	2
4	Suppliers adapt to emergencies and crises.	3.24	0.968	Moderate	5
5	Suppliers have reserve production capacity to respond rapidly.	3.46	0.856	Moderate	1
	Overall Dimension Mean	**3.35**	**0.842**	**Moderate**	**—**

Table 15 shows that the overall mean for the Flexibility dimension was 3.35, with a standard deviation of 0.842, indicating a moderate level. The item means ranged from 3.24 to 3.46.Item 5, concerning suppliers' reserve production capacity for rapid response, ranked first with a mean of 3.46 and a standard deviation of 0.856. Item 4, concerning suppliers' ability to adapt to emergencies and crises, ranked last with a mean of 3.24 and a standard deviation of 0.968.The results indicate that supplier flexibility is at a moderate level. Suppliers appear to have a relatively stronger capacity to maintain reserve production capacity, while their ability to adapt to emergencies and crises received the lowest rating. This suggests that strengthening suppliers' contingency capabilities and responsiveness to unexpected changes could improve overall supplier flexibility.

Cost Dimension

Table 16 Means and Standard Deviations of the Items Measuring Cost

No.	Item	Mean	Standard Deviation	Level	Rank
1	Suppliers offer competitive prices for the supplied materials.	3.68	0.796	High	2
2	Suppliers continuously work to reduce costs.	3.54	0.847	Moderate	4

3	Overall supply costs, including transportation, storage, and inspection, are low.	3.61	0.823	Moderate	3
4	Suppliers provide flexible and appropriate payment terms.	3.72	0.769	High	1
5	Suppliers contribute to reducing quality-related costs resulting from nonconformity.	3.51	0.869	Moderate	5
	Overall Dimension Mean	**3.64**	**0.706**	**Moderate**	**—**

Table 16 shows that the overall mean for the Cost dimension was 3.64, with a standard deviation of 0.706, indicating a moderate level. The item means ranged from 3.51 to 3.72.Item 4, concerning suppliers' provision of flexible and appropriate payment terms, ranked first with a mean of 3.72 and a standard deviation of 0.769. Item 5, concerning suppliers' contribution to reducing quality-related costs resulting from nonconformity, ranked last with a mean of 3.51 and a standard deviation of 0.869.The findings indicate that cost-related supplier performance is at a moderate level. The highest rating was associated with the flexibility and appropriateness of payment terms, whereas suppliers' contribution to reducing quality-related costs received the lowest rating. This suggests that greater cooperation between the company and its suppliers in reducing nonconformity costs could contribute to improving the cost dimension of supplier performance.

Third: Testing the Study Hypotheses

Verification of the Study Hypotheses

Before testing the study hypotheses, the researcher examined the assumptions underlying regression analysis. The normality of the data distribution was assessed using the Kolmogorov-Smirnov test. Multicollinearity among the independent variables was assessed using the Variance Inflation Factor (VIF) and Tolerance values. The results indicated that all the assumptions required for conducting the regression analysis were satisfied.

Main Hypothesis (H1)

Hypothesis Statement

"There is a statistically significant effect at the significance level of α ≤ 0.05 of supply chain quality, with its dimensions of Top Management Support, Relationship with Suppliers, Total Quality Management, Information Integration, and Continuous Improvement, on supplier performance in the General Company for Electrical and Electronic Industries in Baghdad."

To test this hypothesis, Multiple Linear Regression Analysis was employed to measure the effect of the dimensions of Supply Chain Quality as independent variables on Supplier Performance as the dependent variable. The results of the analysis are presented in Table 18.

Table 18 Results of Multiple Regression Analysis of the Effect of Supply Chain Quality Dimensions on Supplier Performance

Independent Variables	**Regression Coefficients B**	**T-value**	**Significance Sig.**
Constant	0.487	2.964	0.004**
Top Management Support	0.184	3.421	0.001**
Relationship with Suppliers	0.246	4.687	0.000**
Total Quality Management	0.198	3.156	0.002**

Information Integration	0.142	2.984	0.003**
Continuous Improvement	0.167	3.245	0.001**
Correlation Coefficient (R)	0.812		
Coefficient of Determination (R^2)	0.659		
F-test Value	46.821		
Probability Value	0.000		

Source: Prepared by the researcher based on SPSS outputs.

The results of the multiple regression analysis presented in Table 18 indicate a statistically significant effect of the Supply Chain Quality dimensions, as independent variables, on Supplier Performance, as the dependent variable. The coefficient of determination (R^2) was 0.659, indicating that 65.9% of the variance in supplier performance at the General Company for Electrical and Electronic Industries in Baghdad can be explained by the five Supply Chain Quality dimensions included in the model. The correlation coefficient (R = 0.812) also indicates a strong relationship among the variables under investigation.

At the level of the individual dimensions, the Relationship with Suppliers dimension had the strongest effect on Supplier Performance. Its regression coefficient was B = 0.246, with a T-value of 4.687 and a significance level of Sig. = 0.000. This result highlights the important role of long-term strategic relationships with suppliers in improving supplier performance through mutual trust, knowledge sharing, and the exchange of expertise.

The results also show that Total Quality Management ranked second in terms of its effect, with a regression coefficient of B = 0.198, a T-value of 3.156, and a significance level of Sig. = 0.002. This finding reflects the importance of adopting a total quality management philosophy as a framework for directing quality practices across the supply chain.

Top Management Support ranked third, with a regression coefficient of B = 0.184, a T-value of 3.421, and a significance level of Sig. = 0.001. This result highlights the important role of leadership in adopting and supporting quality initiatives within the supply chain.

Continuous Improvement ranked fourth, with a regression coefficient of B = 0.167, a T-value of 3.245, and a significance level of Sig. = 0.001. This finding indicates that continuous improvement practices contribute significantly to supplier performance.

Finally, Information Integration had the lowest effect among the five dimensions, with a regression coefficient of B = 0.142, a T-value of 2.984, and a significance level of Sig. = 0.003. Despite having the lowest relative effect, the dimension remained statistically significant. This result suggests that strengthening information integration represents an opportunity to improve the overall supply chain quality system within the company.

Based on these findings, the main hypothesis of the study is supported.

The main hypothesis is further divided into the following sub-hypotheses:

Sub-Hypothesis One (H1.1)

Hypothesis Statement

"There is a statistically significant effect at the significance level of $\alpha \leq 0.05$ of Top Management Support on Supplier Performance in the General Company for Electrical and Electronic Industries in Baghdad."

To test this hypothesis, Simple Linear Regression Analysis was employed. The results are presented in Table 19.

Table 19 Simple Linear Regression Analysis of the Effect of Top Management Support on Supplier Performance

Dependent Variable	r	R^2	df	Calculated F	Sig. F	Independent Variable	B	Standard Error	T	Sig. t
Supplier Performance	0.612	0.375	1	74.982	0.000**	Top Management Support	0.566	0.065	8.660	0.000**

To test this hypothesis, Simple Linear Regression Analysis was used to examine the effect of Top Management Support, as one of the dimensions of Supply Chain Quality, on Supplier Performance. As shown in Table 19, the correlation coefficient was r = 0.612, indicating a positive relationship of moderate strength between the two variables.

The coefficient of determination was $R^2 = 0.375$, indicating that 37.5% of the variance in Supplier Performance can be explained by Top Management Support alone, without considering the effects of the other dimensions of Supply Chain Quality.

The ANOVA results show that the calculated F-value was 74.982, with a significance level of Sig. = 0.000. This value is statistically significant at $\alpha \leq 0.01$, indicating that the regression model as a whole is statistically significant and provides an adequate explanation of the relationship between the two variables.

Regarding the regression coefficients, the effect coefficient was B = 0.566, with a T-value of 8.660 and a significance level of Sig. = 0.000. This result indicates that a one-unit increase in Top Management Support is associated with an increase of 0.566 units in Supplier Performance, under the conditions of the regression model.

Accordingly, the first sub-hypothesis is accepted.

Sub-Hypothesis Two (H1.2)

Hypothesis Statement

"There is a statistically significant effect at the significance level of $\alpha \leq 0.05$ of the Relationship with Suppliers on Supplier Performance in the General Company for Electrical and Electronic Industries in Baghdad."

To test this hypothesis, Simple Linear Regression Analysis was employed. The results are presented in Table 20.

Table 20 Simple Linear Regression Analysis of the Effect of Relationship with Suppliers on Supplier Performance

Dependent Variable	r	R^2	df	Calculated F	Sig. F	Independent Variable	B	Standard Error	T	Sig. t
Supplier Performance	0.687	0.472	1	111.836	0.000**	Relationship with Suppliers	0.577	0.055	10.575	0.000**

The results of the Simple Linear Regression Analysis presented in Table 20 show the effect of Relationship with Suppliers on Supplier Performance. The correlation coefficient was r = 0.687, indicating a strong positive relationship between the two variables. The coefficient of determination was $R^2 = 0.472$, indicating that 47.2% of the variance in Supplier Performance can be explained by Relationship with Suppliers alone. The ANOVA results show that the calculated F-value was 111.836, with a significance level of Sig. = 0.000. This result is

statistically significant at α ≤ 0.01, confirming the statistical significance of the regression model as a whole.

Regarding the regression coefficients, the effect coefficient was B = 0.577, with a T-value of 10.575 and a significance level of Sig. = 0.000. This finding indicates that a one-unit increase in Relationship with Suppliers is associated with an increase of 0.577 units in Supplier Performance.

Accordingly, the second sub-hypothesis is accepted.

Sub-Hypothesis Three (H1.3)

Hypothesis Statement

"There is a statistically significant effect at the significance level of α ≤ 0.05 of Total Quality Management on Supplier Performance in the General Company for Electrical and Electronic Industries in Baghdad."

To test this hypothesis, Simple Linear Regression Analysis was employed. The results are presented in Table 21.

Table 21 Simple Linear Regression Analysis of the Effect of Total Quality Management on Supplier Performance

Dependent Variable	r	R^2	df	Calculated F	Sig. F	Independent Variable	B	Standard Error	T	Sig. t
Supplier Performance	0.641	0.411	1	87.267	0.000**	Total Quality Management	0.608	0.065	9.342	0.000**

The results of the Simple Linear Regression Analysis presented in Table 21 indicate a statistically significant effect of Total Quality Management on Supplier Performance. The correlation coefficient was r = 0.641, indicating a strong positive relationship between the two variables. The coefficient of determination was R^2 = 0.411, indicating that 41.1% of the variance in Supplier Performance can be explained by Total Quality Management alone.

The ANOVA results show that the calculated F-value was 87.267, with a significance level of Sig. = 0.000. This value is statistically significant at α ≤ 0.01, confirming the significance of the regression model as a whole.

Regarding the regression coefficients, the effect coefficient was B = 0.608, with a T-value of 9.342 and a significance level of Sig. = 0.000. This result indicates that a one-unit increase in the application of Total Quality Management is associated with an increase of 0.608 units in Supplier Performance.

Accordingly, the third sub-hypothesis is accepted.

Sub-Hypothesis Four (H1.4)

Hypothesis Statement

"There is a statistically significant effect at the significance level of α ≤ 0.05 of Information Integration on Supplier Performance in the General Company for Electrical and Electronic Industries in Baghdad."

To test this hypothesis, Simple Linear Regression Analysis was employed. The results are presented in Table 22.

Table 22 Simple Linear Regression Analysis of the Effect of Information Integration on Supplier Performance

Dependent Variable	r	R^2	df	Calculated F	Sig. F	Independent Variable	B	Standard Error	T	Sig. t
Supplier Performance	0.578	0.334	1	62.685	0.000**	Information Integration	0.461	0.058	7.917	0.000**

The results of the Simple Linear Regression Analysis presented in Table 22 indicate a statistically significant effect of Information Integration on Supplier Performance. The correlation coefficient was r = 0.578, indicating a moderate positive relationship between the two variables. The coefficient of determination was R^2 = 0.334, indicating that 33.4% of the variance in Supplier Performance can be explained by Information Integration alone.

The ANOVA results show that the calculated F-value was 62.685, with a significance level of Sig. = 0.000. This result is statistically significant at $\alpha \leq 0.01$, confirming the statistical significance of the regression model as a whole.

Regarding the regression coefficients, the effect coefficient was B = 0.461, with a T-value of 7.917 and a significance level of Sig. = 0.000. This finding indicates that a one-unit increase in Information Integration is associated with an increase of 0.461 units in Supplier Performance.

Accordingly, the fourth sub-hypothesis is accepted.

Sub-Hypothesis Five (H1.5)

Hypothesis Statement

"There is a statistically significant effect at the significance level of $\alpha \leq 0.05$ of Continuous Improvement on Supplier Performance in the General Company for Electrical and Electronic Industries in Baghdad."

To test this hypothesis, Simple Linear Regression Analysis was employed. The results are presented in Table 23.

Table 23 Simple Linear Regression Analysis of the Effect of Continuous Improvement on Supplier Performance

Dependent Variable	r	R^2	df	Calculated F	Sig. F	Independent Variable	B	Standard Error	T	Sig. t
Supplier Performance	0.634	0.402	1	84.106	0.000**	Continuous Improvement	0.558	0.061	9.171	0.000**

The results of the Simple Linear Regression Analysis presented in Table 23 indicate a statistically significant effect of Continuous Improvement on Supplier Performance. The correlation coefficient was r = 0.634, indicating a strong positive relationship between the two variables. The coefficient of determination was R^2 = 0.402, indicating that 40.2% of the variance in Supplier Performance can be explained by Continuous Improvement alone.

The ANOVA results show that the calculated F-value was 84.106, with a significance level of Sig. = 0.000. This value is statistically significant at $\alpha \leq 0.01$, confirming the statistical significance of the regression model as a whole.

Regarding the regression coefficients, the effect coefficient was B = 0.558, with a T-value of 9.171 and a significance level of Sig. = 0.000. This result indicates that a one-unit increase in Continuous Improvement is associated with an increase of 0.558 units in Supplier Performance.

Accordingly, the fifth sub-hypothesis is accepted.

Discussion of the Findings

The study revealed that the overall level of Supply Chain Quality practices in the company under investigation was moderate, with an overall mean of 3.60 and a standard deviation of 0.612. The researcher attributes this result to the fact that the company has made progress in adopting some quality practices but has not yet reached the stage of comprehensive and integrated adoption of the Supply Chain Quality philosophy as an approach that extends beyond organizational boundaries. This finding is consistent with Khaddam and Al-Khafaf (2021), who indicated that industrial companies in Arab contexts continue to experience limitations in the comprehensive implementation of quality practices across the supply chain. It is also consistent with Abdallah et al. (2021), who found variations among Jordanian industrial companies in their levels of adoption of supply chain quality practices.

The findings showed that Total Quality Management ranked first among the dimensions of the independent variable, with a mean of 3.72 and a high level. The researcher attributes this result to the company's accumulated experience in applying international quality standards such as ISO 9001. This experience may be related to the requirements of the electrical and electronic industries, which require compliance with precise technical specifications. This finding is consistent with Al-Anani and Abu Rumman (2024) and Wahban and Al-Mahasneh (2024), whose findings indicated that Total Quality Management practices occupy an important position in industrial organizations.

In contrast, Information Integration ranked last among the dimensions of Supply Chain Quality, with a mean of 3.41 and a moderate level. The researcher attributes this result to weaknesses in the company's digital infrastructure and limited investment in electronic data exchange systems with suppliers. This finding is consistent with Bin Abdulaziz and Mahmoud (2023), who indicated that technological limitations can hinder the development of supply services. It also corresponds with Ngo et al. (2024), who found that organizations in developing environments face digital gaps in supply chain management.

The study also showed that the overall level of Supplier Performance in the company was moderate, with a mean of 3.51 and a standard deviation of 0.658. This result indicates a gap between the desired level of supplier performance and the level actually achieved. The researcher attributes this gap to challenges in the Iraqi supply environment, including fluctuations in the performance of local suppliers, high import costs, and weaknesses in logistics infrastructure. This finding is consistent with Abdulaziz (2024), who found that industrial companies in Arab contexts face significant challenges related to supplier performance and require integrated programs to develop supplier capabilities.

The Cost dimension ranked first among the dimensions of Supplier Performance, with a mean of 3.64, whereas the Flexibility dimension ranked last, with a mean of 3.35. The researcher attributes the lower level of supplier flexibility to the limited reserve capacities and adaptive capabilities of many of the company's suppliers, which restrict their ability to respond rapidly to unexpected changes. This finding is consistent with Salam (2021), who reported that limited adoption of Industry 4.0 technologies among suppliers can negatively affect their operational flexibility.

The multiple regression analysis demonstrated a statistically significant effect of the Supply Chain Quality dimensions collectively on Supplier Performance. The five dimensions explained 65.9% of the variance in the dependent variable. This relatively high explanatory power

highlights the strategic importance of supply chain quality practices in improving supplier performance. The finding is consistent with Abdallah et al. (2021), who demonstrated the significant effect of Supply Chain Quality Management on performance. It also corresponds with Al-Nuaimat and Al-Zoubi (2023), who confirmed the positive effect of supplier management strategies on supply chain performance.

The Relationship with Suppliers dimension had the strongest effect on Supplier Performance, with a regression coefficient of B = 0.246. The researcher attributes this result to the importance of long-term strategic relationships based on trust, cooperation, and knowledge sharing. Such relationships can strengthen coordination between the company and its suppliers and create conditions that support improvements in supplier performance. This finding is consistent with Emon et al. (2024), who found that Supplier Relationship Management has a significant effect on supply chain performance in both manufacturing and service sectors.

Information Integration had the weakest effect among the Supply Chain Quality dimensions, with a regression coefficient of B = 0.142. The researcher attributes this result to weaknesses in the digital infrastructure connecting the company and its suppliers, which may limit the ability of information integration practices to generate a stronger effect on performance. This finding corresponds with Ngo et al. (2024), who indicated that modern dynamic practices require appropriate organizational and technological infrastructure to achieve their full potential.

The sub-hypothesis tests further demonstrated statistically significant effects of each Supply Chain Quality dimension on Supplier Performance when examined separately. Relationship with Suppliers explained 47.2% of the variance in Supplier Performance, followed by Total Quality Management at 41.1%, Continuous Improvement at 40.2%, Top Management Support at 37.5%, and Information Integration at 33.4%.

Overall, these findings support the view that each dimension of Supply Chain Quality contributes independently to improving Supplier Performance. The results also demonstrate that the dimensions do not have equal explanatory or predictive strength. Relationship with Suppliers showed the strongest individual explanatory power, whereas Information Integration showed the weakest. This pattern highlights the importance of strengthening both relational practices and digital capabilities to improve supplier performance in the Iraqi industrial context.

Recommendations

In light of the findings of the study, the researcher recommends the following:

1. Strengthen long-term strategic relationships with suppliers and adopt a partnership-based approach instead of relying on short-term transactions. This can be achieved through framework agreements and joint cooperation programs for product development.
2. Invest in digital infrastructure and Electronic Data Interchange (EDI) systems and integrate these systems with key suppliers to achieve the timely and accurate flow of information across the supply chain.
3. Establish a specialized supplier development unit responsible for providing suppliers with technical and managerial training and development programs. The unit should focus on strengthening suppliers' capabilities to meet the company's requirements, particularly in the area of flexibility, which recorded the lowest level among the dimensions of Supplier Performance.
4. Adopt modern continuous improvement methodologies such as Six Sigma and Kaizen in a systematic and sustained manner and extend their application to suppliers through joint improvement initiatives.

5. Strengthen the role of top management in adopting the Supply Chain Quality philosophy by developing a clear strategic vision, allocating the required resources, and creating an organizational culture that supports quality-oriented practices.
6. Develop a periodic supplier performance evaluation system based on clearly defined quantitative Key Performance Indicators (KPIs) covering quality, delivery, flexibility, and cost. The results of these evaluations should be incorporated into supplier selection and contract-awarding decisions.
7. Establish a centralized database for approved suppliers that includes comprehensive records of their historical performance, technical capabilities, quality certifications, delivery records, and other relevant information. Such a database can support informed purchasing and supplier selection decisions.
8. Encourage investment in Industry 4.0 technologies, including the Internet of Things (IoT) and Artificial Intelligence (AI), among suppliers. The company should support suppliers in adopting these technologies to strengthen their technological capabilities and improve their competitiveness and responsiveness.
9. Conduct future empirical studies that examine potential mediating and moderating variables, such as supply chain agility, innovation, and sustainability. Future research should also expand the scope of investigation to include other Iraqi industrial sectors to provide broader evidence regarding the relationship between Supply Chain Quality and Supplier Performance.

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