Research Paper

The Impact of Total Quality Management on the Performance of Supply Chains in Jordanian Public-Shareholding Industrial Companies

Dr. Mohammad Haider Sadiq Mahmoud Mohailan

Assistant Professor - Institute of Public Administration - Riyadh - Saudi Arabia

Corresponding Author: Dr. Mohammad Haider Sadiq Mahmoud Mohailan

ABSTRACT

The study attempt to determine the relative importance of total quality management (TQM) and supply chains in Jordanian public shareholding companies, as well as the impact of total quality management in its dimensions (focus on the customer; senior management commitment to quality; focus on improving operations; and worker participation in decision-making) in supply chains with its combined dimensions (Supply Chain Efficiency, Customer Response, and Product Innovation) in Jordanian public shareholding companies.
The descriptive analytical approach was employed in the study, as well as the comprehensive survey method, which was applied to the full study community and to 162 persons working in Jordanian public shareholding industrial businesses at the upper and middle administrative levels. The study tool was delivered to them in the form of a questionnaire created by the researcher specifically for this purpose. A total of 157 valid questionnaires were obtained for statistical analysis. The study revealed a number of findings, the most important of which are: the presence of a high level of total quality management and supply chain performance in the study sample companies, as well as the presence of a statistically significant effect for all dimensions of total quality management on supply chain performance in those companies. The study recommended that Jordanian public shareholding industrial companies continue to improve total quality management dimensions through their understanding of their importance in order to increase efficiency and effectiveness, achieve strategic growth and business success, and develop and improve supply chain performance.

Keywords: Total Quality Management (TQM), supply chain performance, public shareholding industrial companies, Jordan.

INTRODUCTION

In light of our current world's economic, political, and technological developments, as well as the intensification of competition over markets and resources with their multiple components, whether physical or human resources, and the increase in their own ability to adapt and harmonize with the critical variables in the competitive environment, quality holds a distinct importance in contemporary management philosophy. The need for change in working techniques has become increasingly pressing as a result of rapid technological advancements, the demographic structure of human resources, and a growing emphasis on quality and flexibility in product production and service delivery. (Lewis, 2016).

Due to its important role as one of the current administrative approaches that contribute to boosting the level of corporate performance, TQM has become the talk of those concerned with organizational improvement and development in both developed and developing countries. Given the current global challenges posed by the

revolution in communication and information technology, as well as the race to satisfy beneficiaries, it is critical for all organizations to employ the scientific method in addressing these challenges and to invest effective human energies in improving performance with greater flexibility, efficiency, and effectiveness. (Nasari, 2021).

On the other hand, supply chain management is one of the most important processes required to achieve business organizations' objectives of maximizing asset value, as good supply chain management would reduce the costs of operations activities in organizations and increase their profitability, resulting in an increase in the efficiency of those organizations. Since supply chains are viewed as an integrated network of processes and relationships between production and sales elements, managing supply chains and seeking ways to improve their performance has become one of the primary tasks of managing business organizations by providing the necessary information for supply chain management planning and providing what decision makers require from information. (Kreesat, 2020).

Supply chains, basically, are a network of interactions between customers and suppliers, with each member in the chain committed to contributing value in order to give the client with the end product or service. These relationships are also built on performance and trust, with a focus on delivery time, cost, and quality, which means that the characteristics of a product or service meet a set of customer requirements and are suitable for the intended use of those customers from a supply chain management standpoint (Al-Abadi, 2019). Based on the aforementioned, the purpose of this study was to investigate the impact of overall quality management on supply chain performance in Jordanian public shareholding industrial enterprises.

Study problems and questions
The problem of the study emerges through the question: (What is the impact of total quality management on the performance of supply chains in Jordanian public shareholding industrial companies?).
From this main question, the following sub-questions are derived:

1. What is the relative importance of total quality management dimensions (customer focus; senior management commitment to quality; focus on improving operations; and employee engagement in decision-making) in Jordanian public shareholding industrial companies?

2. How important are supply chain dimensions (supply chain integration, supply chain efficiency, customer response, and product innovation) in Jordanian public shareholding industrial companies?

3. What is the impact of focusing on the customer as one of the dimensions of total quality management in supply chains (supply chain integration, supply chain efficiency, customer response, and product innovation) in Jordanian public shareholding industrial companies?

4. What is the impact of Jordanian public shareholding industrial companies' senior management commitment to quality as one of the dimensions of total quality management in supply chains with its combined dimensions (supply chain integration, supply chain efficiency, customer response, and product innovation)?

5. What is the impact on Jordanian public shareholding industrial companies of focusing on improving operations as one of the dimensions of total quality management in supply chains with its combined dimensions (supply chain integration, supply chain efficiency, customer response, and product innovation)?

6. What is the impact of employee participation in decision-making in Jordanian public shareholding industrial

companies as one of the dimensions of total quality management in supply chains with its combined dimensions (supply chain integration, supply chain efficiency, customer response, and product innovation)?

The importance of studying

The study's importance stems from the issue it discusses as well as the importance of the companies assessed in a sector that is regarded as one of the most vital sectors supporting the national economy. The following scientific and practical factors underline the study's significance:

Scientific aspect:

- Creating a clear conceptual framework for the primary study variables (total quality management-supply chains) in order to analyze their contents and understand their significance and benefits.
- Increasing the level of clarity in the concepts and dimensions of the main and sub-variables by collecting and analyzing researcher opinions; drawing attention to the subject of study in the Jordanian industry sector and conducting more comprehensive and deeper studies that enhance the importance of the subject of study and enrich the theoretical literature on this subject in general, to contribute to filling a part of the knowledge gap for these important topics, which represents an opportunity for organizations in various sectors under these turbulent conditions of economic crises and subsequent social changes, so that organizations can survive or enhance their presence by capitalizing on the opportunities generated by these challenges.
- Contribute to the Arab library by providing a study that sheds light on contemporary variables in administrative and strategic literature, inspiring other researchers and paving the way for them to expand the study and analysis of these variables in other

sectors and cover the aspects that this study was unable to cover.

Practical aspect:

The study adds to the provision of knowledge about overall quality management in its various dimensions and its impact on supply chains in its various aspects to administrative practitioners in the Jordanian industrial sector. Making recommendations to Jordanian public shareholding industrial companies on how to use total quality management dimensions to achieve efficiency and effectiveness in supply chains improves and contributes to the effectiveness and continuity of these companies.

Objectives

This study seeks to achieve a number of objectives that can be reviewed as follows:

1. Recognizing the relative importance of total quality management aspects and supplier chains in Jordanian public shareholding industrial firms.
2. Evaluating the impact of total quality management in its dimensions (customer focus, senior management commitment to quality, focus on process improvement, and employee engagement in decision-making) on supply chains in Jordanian public shareholding industrial companies.
3. Presenting a series of recommendations to assist decision-makers in Jordanian public shareholding industrial companies in improving the role of comprehensive quality management in supply chain performance.

Study hypotheses

Relying on the study questions and objectives, this study tested the main hypothesis:

H01: There is no statistically significant effect at the level of significance ($\alpha \leq 0.05$) for total quality management with its dimensions (customer focus, senior management commitment to quality, focus on process improvement, and employee engagement in decision-making) on the

performance of supply chains with its combined dimensions (Supply Chain Integration, Supply Chain Efficiency, Customer Response, and Product Innovation) in Jordanian public shareholding industrial companies.

The following sub-hypotheses are derived from the main hypothesis:

H01-1: There is no statistically significant effect at the significance level ($α≤0.05$) of customer focus on the performance of supply chains in Jordanian public shareholding industrial companies.

H01-2: There is no statistically significant effect at the significance level ($α≤0.05$) for the commitment of senior management to quality in the performance of supply chains in Jordanian public shareholding industrial companies.

H01-3: There is no statistically significant effect of focusing on improving operations in the performance of supply chains in Jordanian public shareholding industrial companies at the significance level ($α≤0.05$).

H01-4: There is no statistically significant effect at the significance level ($α≤0.05$) for employees' participation in decision-making in the performance of supply chains in Jordanian public shareholding industrial companies.

Study model

Relying on previous references and studies, the researcher developed the study model shown in Figure (1).
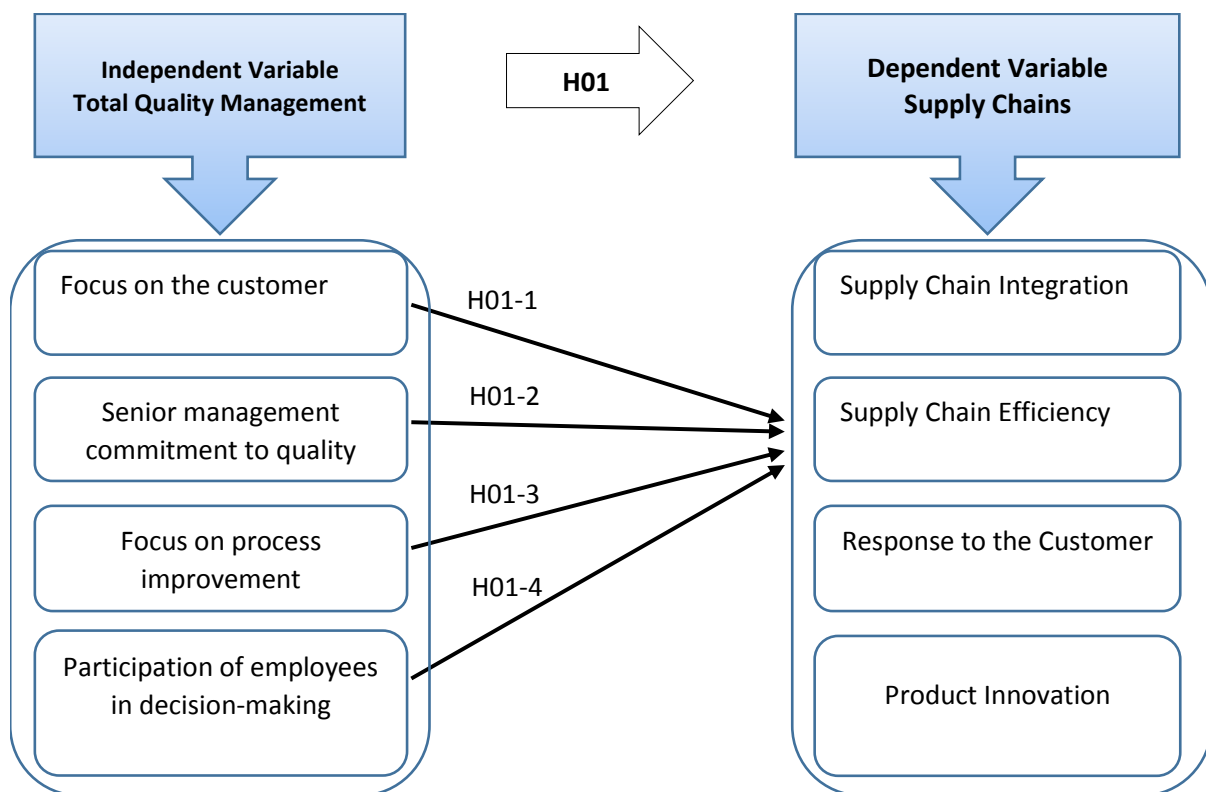

Figure (1) Study Model

The researchers formulated the study model based on previous studies shown in the following sources:

– **The Independent Variable:** (Nasari, 2021) (Haddad, 2020) (Jaeger & Adair, 2016)

– **Dependent variable:** (Khuraisat, 2020) (Sadurdeen & Sutha, 2019) - (Gawankar et al., 2016)

Limitation

• **Objective:** The current study is limited to examining the effect of Total Quality

Management on supply chain performance in Jordanian public shareholding industrial enterprises.

- **Spatial limitations:** limited to Jordanian public shareholding industrial businesses.
- **Sample limitations:** the study is limited to a sample of middle and senior management staff in Jordanian public shareholding industrial companies.
- **Time limitations:** This study was carried out over the academic years 2021–2022.

The theoretical framework and previous studies

Total Quality Management (TQM)

Total Quality Management (TQM) is a current administrative idea in corporate performance and management. This concept emphasizes on customer happiness (the beneficiary) and product or service quality through continual improvement of the organization's activities, activating teamwork and the creative aspects of all its employees, and obtaining the proper work performance the first time and every time (Haddad, 2020). The definitions given by writers and individuals interested in the subject of quality differed greatly in terms of establishing a particular definition of the meaning and content of quality, as well as its different dimensions. Because of its many facets, it is difficult to create a concise definition that characterizes and defines it thoroughly and conclusively. According to Al-Ajmi (2020), it is a management strategy that ensures value to clients (customers) by continuous improvement and development of administrative procedures that are done correctly the first time and every time based on the client's demands and requirements.

According to Azarian et al. (2020) TQM is "the entry into organized management that focuses on quality and is based on the engagement of all employees of the organization and aims for long-term success through customer satisfaction and achieving benefits for employees of the organization and society as a whole". Total quality management, according to Abbas (2020), is a modern management philosophy that takes the form of a comprehensive management system or curriculum based on radical changes in thought, behavior, values, beliefs, management concepts, administrative leadership style, work systems and procedures, and performance within the organization. Everything in it aims to develop and improve all organizational components in order to achieve the highest quality of output of goods and services at the lowest cost, and thus achieve the highest levels of customer satisfaction by satisfying their needs and desires according to what they expect, in accordance with a strategy that realizes that customer satisfaction and the organization's goal are synonymous with each other.

Total quality management is defined by Mayouf and Al-Arabi (2021) as "a philosophy of an integrated intellectual approach based on consumer satisfaction as the most important long-term goal that the organization seeks through collective responsibility between management and workers for continuous improvements in all activities and at all levels of the organization". An integrated one that necessitates the entire commitment of senior management, as the emphasis is on the quality of performance in all aspects and the company's different specializations

Total Quality Management (TQM) is a modern management philosophy based on a number of modern direct management concepts that rely on a combination of administrative means, innovative efforts, and specialized technical skills to raise performance levels and promote continuous improvement and development (Hamed, 2019). It also defines quality as a set of various characteristics and features that must be available in the product in a way that matches and is comparable with the features and characteristics specified in advance for this product. The modern concept of quality is also a set of defined features that must be present in the necessary product to suit the expectations of

consumers. According to this notion, quality can be seen in one of three ways (Tawfik, 2018; Lewis, 2016):

1. **Quality by Design (QBD):** Quality by design is a global and comprehensive approach that consists of three processes: quality planning to develop products and processes needed to meet customer needs, quality control to evaluate actual performance and correct deviations from quality objectives, and quality improvement to elevate good performance to unprecedented levels.

2. **Quality Performance (QP):** It is to reach the maximum possible quality and to develop a product capable of meeting client and customer satisfaction, and it is a specific performance level that the institution must determine based on the overall market scenario and the categories targeted by a company. This foundation is followed at all stages of production, including the company's control of the product outside of the production stations, focusing on numerical values to determine the extent to which quality is achieved in performance using precise statistics.

3. **Production Quality:** It refers to the quality of conformance with the product's basic standards, which has a beneficial impact on the entire quality of production, in order to meet the needs and satisfaction of customers and achieve overall market competition. In addition to satisfaction, the quality of the product is reflected by its compliance with the requirements set, and thus its capacity to satisfy the demands of customers and get the desired benefit from it. A product is of excellent quality if it possesses the following features:

- A reduction in the number of potential flaws.
- A low number of damaged and missing items.
- A low number of consumer complaints.

- Less product inspection and testing is required.
- The ability to fulfill the consumer's wishes and requirements
- Reduce consumption costs.

According to the research, total quality management is a management philosophy that focuses on a set of practices such as customer satisfaction, continuous improvement, employee empowerment, and the fundamental tools to achieve customer satisfaction based on administrative performance in planning, organizing, and controlling activities in all functional areas.

Dimensions of Total Quality Management
There are many dimensions that represent total quality management. The current study relied on four dimensions, including the following:

1. Focus on the customer.
Because the client is the company's fundamental purpose, the key to its success, and the yardstick by which it measures its development, it is vital to respond to his desires, needs, and renewable preferences. Thus, total quality management prioritizes the customer owing to its complete conviction as the foundation for all activities inside the firm, because satisfying his preferences and actual needs is impossible without meeting his preferences and genuine needs. External or internal growth is possible for the organization. According to Foster (2013), understanding the customer is the key to comprehensive quality management initiatives, thus businesses must collect and evaluate data on customers in order to discover the wants and desires of customers. Customer satisfaction is linked to customer service, which is regarded as a critical part of quality, because staff must understand what internal and external consumers want or expect from them in order to develop and provide quality. Employees will be able to use this knowledge to begin improving the procedures that contribute to the corporation becoming a comprehensive quality

management company. The extra value of quality that contributes to exceeding consumer expectations and satisfying them. According to research, focusing on customer loyalty can provide many business benefits, including the fact that the cost of customer retention is lower than the cost of acquiring new customers, and the longer the relationship with the customer, the higher the profitability because loyal customers commit to spending at the chosen source, and they market the organization's knowledge, which reduces customer acquisition costs (Oakland, 2015).

2. Senior management commitment

The first step toward successful implementation of overall quality management is senior management's support and commitment. Although higher management allocates the resources needed for production processes, it is necessary to establish a set of priorities aimed at reinforcing plans connected to achieving good total quality management application and implementing it without reluctance.

The support of senior management is an important variable in explaining organizational operational performance, as leaders play a critical role as key drivers in the implementation of total quality management and performance improvement, and the role of the leader appears to be being the main force in improving quality, as companies with weak leadership will not gain an advantage. As a result, executives must understand the TQM methodology and be willing to serve as role models (Foster, 2013). The management's commitment to quality is demonstrated by ensuring the needs of cash and time, as well as permitting and supporting improvements to assure their success. A written and announced policy at the start of the introduction to the implementation of quality management and its practices, in addition to the need for senior management commitment to follow the commitment of other administrative levels to ensure the success of implementation, and that senior

management support for total quality management implementation appears through the introduction of total quality within the process of strategic management (Khreisat, 2020).

3. Focus on improving operations.

The goal of operations improvement is to achieve relative perfection, despite the difficulties of obtaining it, but this in itself is a motivator for continual and increasing progress and improvement, as the Japanese do. Thus, there is no end to quality; rather, it is a process that demands continuous progress. Because the emphasis on improving and managing operations is related to a strategic initiative, such as reducing non-value-added time, increasing customer satisfaction, and reducing working capital, as well as implementing ERP, changes in technology, or introducing e-business, organizations must review the design of and configure key processes, because ignoring this can lead to missed opportunities to make the most of the technology (Okland, 2014).

As a result, operations must be aligned with the organization's strategic goals, designed and implemented, systems to measure the process in line with organizational goals established, managers must be educated and organized so that they can manage operations effectively, and organizations must work to integrate quality into the process, particularly quality at the source, which is the belief that it is much better to discover the source of quality problems and co-ordinate their resolution (Reid & Sanders, 2011).

4. Participation of employees in decision-making

Total quality management must develop incentive programs and provide opportunities for all employees to participate and be a part of every step of product realization, beginning with product design and identifying the necessary raw materials and ending with the delivery of

the product to customers in accordance with the required and desired specifications.

Supply Chain Performance

Supply chain performance is a critical issue in many industries, as supply chain management is critical to attaining a competitive advantage in the global business world. As a result, supply chains have become one of the most significant competitive abilities for organizations (Beullens & Ghiami, 2022).The supply chain is defined as a network of companies that communicate with one another in to achieve their objectives and the goals of stakeholders, and it also connects companies through intersections with logistical operations and strategies that contribute to improving the advertising of the company's goods and products in order to increase profits, as service providers in companies and consumers are linked to the supply chain (Sadurdeen & Sutha, 2019).

It is also defined as a collection of operations that businesses carry out on a regular basis based on available materials in order to develop and provide quality and effective goods and services, resulting in the satisfaction of consumer desires and satisfaction. This enhances the company's market reputation, increases demand, distinguishes it from other competing companies, and improves its marketing performance (Ahmed, 2021).

Entities established and included in the manufacture of new products and distinctive services; provision of raw materials; and work on converting these materials into semi-finished items and delivering them to the client (Rabie 2020). A network of diverse units working to manage and process operations in order to increase the ability to provide materials and information, and it is an interconnected network of value-creating activities that begin with raw materials and end with customers receiving products and goods. (Modgil et al. 2021)

Supply chain management is defined as "an integrated range of actions and practices that begin with the activities of procuring inputs and end with the activities of providing products or services to customers through distribution networks and marketing channels" (Afraz et al., 2021). The dynamic flow of information, products, and finances continuously between the several phases and encompasses all chain partners, directly or indirectly, in order to meet client wishes (Tohamy and Zeitoun 2022).

According to the previous definitions, the researcher believes that supply chain management is a set of activities, processes, and practices that a business organization performs in collaboration with its suppliers to ensure that the organization maximizes its internal operations to provide a final product that meets customer satisfaction and achieves profits for shareholders, which means managing, planning, organizing, directing, and controlling all of the organization's activities. This is to ensure the flow of goods, services, and information from the primary supplier to the end customer by ensuring the flow of products, funds, expertise, and information across the chain of suppliers, organizations, and customers to the maximum benefit of all links in the chain within a network of dependencies between supplying, manufacturing, and distribution centers.

Supply Chain Dimensions

As numerous trends have emerged in assessing supply chain performance, especially since (2001), when it became crucial to analyze the competitiveness of firms, goals, and plans, the standards for measuring supply chain performance have varied with different points of view among scholars. A collection of criteria used to measure the efficiency and effectiveness of supply chain operations in order for the chain to work in harmony is defined as supply chain performance measurement (Maestrini et al., 2017). The researcher used the following dimensions to assess the performance of the supply chain:

1. Supply chain integration

The ultimate purpose of supply chain management is to add value to the goods and services delivered to the end consumer, which benefits the enterprises involved in the supply chain network. Supply chain integration is defined by (Alfalla, Gracia, and Lopez 2015) as the degree to which all activities within a company, its suppliers, customers, and supply chain members are integrated together, and it measures the degree to which a company collaboratively manages operations and activities within the organization to achieve efficient flows of products, services, information, and money. Money moves from the raw material stage to the end users in order to provide the most value to the final users (Liu, Ke, We & Hua 2013). Internal and external supply chain integration are the two types of supply chain integration. Internal integration refers to the degree to which functions inside a firm collaborate and interact to solve problems and produce mutually accepted outcomes. They assist one another in reducing repetitive chores, improving product quality, and participating in product design (Huo, Qi, Wang & Zhao, 2014). The amount to which a manufacturer builds collaborative relationships, communicates information, and jointly prepares supply chain activities or operations with both suppliers and customers is referred to as external integration (Danese & Romano, 2013). According to the study, supply chain integration has a favorable impact on the efficiency and effectiveness of all operations and functions inside the supply chain on the one hand, and the overall performance of the company on the other.

2. Efficient supply chains

By researching previous literature, it was discovered that efficiency was analyzed in financial terms and focused on the extent of the organization's ability to accomplish optimal resource usage, which is demonstrated by reducing costs and increasing profits, where profit better reflects cost efficiency. Cost efficiency is defined by Likka (2015) as the cost of products to be manufactured based on measured production times and machine hour rates. At the same time, supply chain efficiency aims to coordinate the flow of services in materials and services and thus reduce inventory, increase the efficiency of manufacturers and chain providers, as the expected demand for products allows the company and its supply chain partners to use higher efficiency and a minimum stock, while providing high levels at the same time for cost-conscious customers (Parmigiani, Klassen & Russo, 2011).

According to Chopra and Meindl (2016), an efficient supply chain is defined by fulfilling orders at the lowest possible cost, maximizing performance at the lowest possible cost of the product, lower profit margins because price is the most important factor in the purchasing decision, lower costs through optimal resource use, and reducing inventory.

Measuring supply chain performance necessitates the creation of an inter-organizational evaluation mechanism. According to Kale (2016), it is necessary to identify opportunities to improve supply chain efficiency and competitiveness, to aid in understanding how supply chain companies affect each other's performance, to support supply chain meeting consumer requirements, and to evaluate the outcome of an initiative implemented through the establishment of an evaluation system for cross-organizational supply chain performance.

3. Responding to the customer

In the global business environment and fast-volatile markets with more product types and short product life cycles due to fierce rivalry, responding to customer demands is a crucial competitive component. "The company's rapid response to customer requests, as responding to customer requests is one of the most important factors in measuring the performance of the supply chain, which aims to increase response to customer needs at the lowest cost and transform savings into additional value for

customers." The response is related to innovative or short-term items." (Ramanathan, Gunasekaran, & Subramania, 2011)

According to Al-Ali and Al-Kanaani (2019), establishing the organization's competitive advantage is based on the speedy response to client requests, which can be done by reducing total time of production, adopting current practices in inventories, and building strong partnerships with suppliers. A supply chain that can respond to the market and customers has a variety of skills, including the ability to satisfy a wide range of needs, reduce time, cope with product diversity, ongoing product innovation, and provide higher levels of service to deal with supply unpredictability (Chopra, et al., 2013).

4. Product innovation

Product innovation is the process of releasing a new product to the market that employs a different technology and provides greater value to the consumer than existing items (Chitakomkijsil, 2012). Product innovation, according toJayaram & Patel (2013), encompasses not only the number of distinct product categories in a company's product portfolio, but also the number of unique product categories inside each product category. According to Gawakar et al. (2017), organizational performance is dependent on product innovation, which increases market power as well as the ability to deal with market conditions, and that product innovation increases the company's strength in a highly competitive market, increasing consumer loyalty and satisfying a wide range of consumer needs. In the near run, innovative products generate the most profit, which reduces over time as affiliates replicate the new innovative offering. As a result, businesses must sustain their innovation, particularly for complementary items that generate interdependence in the product market (Gawankar et al., 2017).

Previous studies

The researcher was able to access a set of previous studies directly related to the subject of his study or one of its variables, where a group of these studies were summarized and arranged according to chronological order from the most recent to the oldest, as follows:

Nassari study (2021), entitled: "The Impact of Total Quality Management on the Performance of Production Systems in Food Industry Companies".

The study sought to determine the impact of total quality management in terms of continuous improvement on the performance of production systems, as represented by the quality of production systems and the cost of production, by applying to food industry companies listed on the Egyptian Stock Exchange. The descriptive analytical approach was used in the study, which included a basic random sample of 115 managers from food industry companies. The study's findings showed that there is a statistically significant association between overall quality and production system performance when applied to food industry companies listed on the Egyptian Stock Exchange. This is due to food industry companies' focus on improving the performance of their production systems, as well as their interest in raising awareness and training, as well as acquiring highly skilled and experienced workers through whom they can apply total quality in all their specializations, which are exploited to raise and improve the quality of food products and gain the ability to compete in the market.

Khraisat study (2020), entitled: "Total quality management practices and their impact on the performance of supply chains: The mediating role of organization resource planning systems in pharmaceutical companies in Jordan".

The purpose of this study was to determine the impact of overall quality management methods on the performance of supply chains in Jordanian pharmaceutical enterprises. The descriptive analytical approach was used in the study, with the

study population consisting of 831 managers from all administrative levels in Jordanian pharmaceutical enterprises, and the procedure depended on the proportional stratified random sampling method, with a response rate of 231 managers. The study yielded several conclusions, the most important of which are the existence of high levels of the arithmetic mean for the dimensions of total quality management practices (leadership, strategic planning, customer focus, team work, operations management, information and analysis), as well as the dimensions of supply chain performance (supply chain resilience, supply chain integration, customer response, product innovation).

The dimension (supply chain efficiency) was rated as medium important, and the study's findings revealed a statistically significant impact of total quality management practices on supply chain performance, as well as a statistically significant impact of total quality management practices on organizational resource planning.

Haddad study (2020), entitled: "The Impact of Total Quality Management on the Performance of Jordanian Food Companies".
The study aims to examine the impact of complete quality management (commitment of senior management, customer focus, relationship with suppliers, employee training) on the performance of Jordanian food enterprises using the balanced scorecard and its dimensions (growth and learning, customer satisfaction, quality of internal processes, dimension financial). The descriptive analytical approach was utilized to meet the study's aims, with the study population consisting of all personnel at Jordanian food industries' supervisory and control authority. From the study population, a simple random sample of 209 was drawn. The study found a statistically significant effect at the significance level ($\alpha \geq 0.05$) for total quality management on the performance of Jordanian food companies using the balanced scorecard (learning and growth, customer satisfaction, quality of internal processes, and financial dimension) in Jordanian food companies.

AL-Shboul monograph (2019) entitled: "The Impact of Jordan's Logistic Capabilities and Supply Chain Performance on Textile Manufacturing Firm Performance an Empirical Investigation".
The study aimed to identify the logistical capabilities and supply chain performance elements (supply chain resilience, supply chain response, transportation assurance, supplier cooperation, and customer satisfaction) used by textile manufacturers in Jordan and their impact on the performance of textile manufacturers. The study adopted the descriptive analytical approach, and the study population consisted of all logistics managers in textile manufacturing companies. A random sample of 44 managers was taken. The results showed that Jordanian logistical capabilities such as roads, seaports, and communications are qualified and high-quality, facilitating and supporting the elements of supply chain performance, and it was also found that they have a moderate positive impact on the performance of supply chains in terms of supply chain response, customer satisfaction, and delivery reliability. The positive impact was high, and the results showed a positive impact on the performance of supply chains and logistical capabilities on the performance of textile manufacturers.

Priporas & Psychogios (2016) study entitled: "Understanding Total Quality Management in Context: Qualitative Research on Managers' Awareness of TQM Aspects in the Greek Service Industry".
This study aimed to identify the extent of managers' knowledge and awareness of the concept of total quality management with its two sides and the difference between managers in the public sector and the

private sector on this matter. To achieve the objective of the study, the researchers relied on the Delphi method (Expert Interview Method). This study included 400 managers working in the service sector in Greece, 18 of whom were selected for interviews. The study concluded that managers in the service sector have superficial and in-depth knowledge of total quality management, and the study also showed that managers do not have the necessary knowledge or care about the aspects that deal with management practices and human resources from the principles of total quality management. While they greatly consider the other aspect, which is the interest in statistical methods.

Seetharaman (2016) study entitled: "Critical Success Factors of Total Quality Management, Quality & Quantity".
The study aimed to search for the factors that determine the success or failure of adopting the philosophy of total quality management as a means to improve competitive strength and increase profits. The study concluded that adopting the philosophy of total quality requires patience and requires years for its results to appear. It does not necessarily mean that all decisions that will be taken under the philosophy of total quality will be correct, and that is not due to the philosophy itself, but to its understanding and the way to apply it. Six critical factors have been identified: senior management commitment and understanding of the philosophy of quality, understanding of TQM guidelines, methods, and implementation plan, knowledge of the benefits of TQM application, understanding of TQM philosophy and methods of its measurement, focus on customers as a key to success, and understanding the importance of continuous improvement and its inclusion in the system.

Kerr (2015) study entitled: "The Relationship Between Total Quality Management Practices and Organizational Performance in Service Organizations".

The study aimed to determine the impact of the application of total quality on increasing productivity and improving efficiency in service organizations, that is, the continuous development of administrative processes, through their review and analysis, and the search for means and ways to raise the level of performance and reduce the time to complete them by dispensing with all useless and unnecessary tasks and functions for the client or for operation, in order to reduce cost and raise the level of quality, based in all stages of development on the requirements and needs of the client. The study relied on the descriptive method of analysis in the study by distributing a questionnaire to a random sample representing the study community and 350 workers in service organizations.
The study concluded that the most important factor in the application of total quality management in service organizations is the support of senior management. The more this support is available, the easier the application of total quality management is, and the most important result of the application of total quality management is customer satisfaction.

What distinguishes the current study from previous studies?
Total quality management is one of the most prominent topics that have received the attention of researchers from academics and management practitioners in recently as the focus has become on it as one of the management practices that business organizations seek to adopt in general, while the issue of the performance of supply chains comes at the forefront of the concerns of business organizations because of its great role in the continuity of these organizations and their survival in a highly complex competitive environment, in addition to the above, the study seeks to demonstrate the impact of total quality management on the performance of supply chains in industrial public shareholding companies Jordanian. From this point of view and based on the foregoing review of

some previous studies related to the variables of the study and a statement of the similarities and differences between them and what distinguishes the current study from them, the researcher emphasizes the following:

After the researcher reviewed the relevant studies, it became clear that none of these studies dealt with the subject of his current study, which seeks to identify and demonstrate the impact of total quality management on the performance of supply chains in Jordanian public shareholding industrial companies. Most of the previous studies examined the effect of one of the variables in the current study, whether independent, dependent, or modified, on another variable.

After the researcher reviewed the relevant previous studies in the Arab environment, he found, within the limits of his knowledge, a dearth of these studies that dealt with the impact of total quality management on the performance of supply chains, specifically in the Jordanian public shareholding industrial companies.

The current study tested the impact of total quality management on the performance of supply chains and indicated the levels of application of total quality management and the levels of supply chains in the Jordanian public shareholding industrial companies in order to achieve precedence in this field.

This study is distinguished from previous studies in the accredited society, which dealt with the Jordanian public shareholding industrial companies as one of the most important institutions and companies that provide the Jordanian treasury financially and contribute to the local economy as well as to social stability by reducing unemployment and employing manpower.

Study Methodology

The study relied on the descriptive analytical approach by describing the study variables represented by total quality management and supply chains and analyzing the data collected from the study sample members with the aim of testing the impact of total quality management on the performance of supply chains in Jordanian public shareholding industrial companies.

Study Population and Sample

The study population consisted of all employees in Jordanian public shareholding industrial companies within the upper and middle management levels, which numbered 352 individuals. According to the statistics of the Amman Stock Exchange for the year 2020, a random sample of 157 individuals was selected.

Validity and reliability of the study tool
1. Validity:

The validity of the questionnaire content was measured by measuring the relationship between each paragraph and the axis to which it belongs and excluding paragraphs that have a weak correlation coefficient and have statistical significance at ($\alpha \leq 0.05$), as follows:

First: The Independent Variable (Total Quality Management)

Table (1): The construction validity of the independent variable items (total quality management)

Paragraph	R	Sig.	paragraph	R	Sig.
1	.4410	0.00**	12	.4340	0.00**
2	.5470	0.00**	13	.5290	0.00**
3	.6150	0.00**	14	.4020	0.00**
4	.4110	0.00**	15	.5360	0.00**
5	.4300	0.00**	16	.5790	0.00**
6	.4560	0.00**	17	.4460	0.00**
7	.4240	0.00**	18	.4690	0.00**
8	.4820	0.00**	19	.5460	0.00**
9	.4000	0.00**	20	.6880	0.00**
10	.3960	0.00**	21	.5000	0.00**
11	.4650	0.00**			

Statically significant at (0.01)

It is clear from Table (1) that the correlation coefficients for the paragraphs of the dimensions of the independent variable ranged between 0.396 and 0.688, and it is statistically significant at the level of (0.01). This indicates an internal consistency between the paragraphs of this variable.

The researcher also tested the content validity of the dimensions of total quality management, as shown in the following table:

Table (2): validity of the total quality management dimensions

Dimension	R	Sig.
Focus on the customer	0.772	**0.000
Senior management commitment to quality	0.689	**0.000
Focus on process improvement	0.813	**0.000
Engagement of employees in decision-making	0.725	**0.000

**Statically significant at (0.01)

From Table (2), it is clear that the correlation coefficients for the dimensions of total quality management as an independent variable ranged between 0.725 and 0.813, and it is statistically significant at the level of (0.01), and this indicates a strong internal consistency for the dimensions of total quality management.

Second: The Dependent Variable (Supply Chain Performance)

Table (3): validity of the paragraphs of the dependent variable (supply chain performance)

Paragraph	R	Sig.	paragraph	R	Sig.
1	.5300	**0.00	12	.3990	**0.00
2	.5820	**0.00	13	.5640	**0.00
3	.4450	**0.00	14	.2200	**0.00
4	.3740	**0.00	15	.5620	**0.00
5	.4190	**0.00	16	.5040	**0.00
6	.3330	**0.00	17	.3840	**0.00
7	.4690	**0.00	18	.5290	**0.00
8	.3510	**0.00	19	.5190	**0.00
9	.6160	**0.00	20	.6260	**0.00
10	.6030	**0.00	21	.5290	**0.00
11	.4970	**0.00			

**Statically significant at (0.01)

Table (3) shows that the correlation coefficients for the paragraphs of the independent variable (supply chain performance) ranged between 0.220 and 0.626, and it is statistically significant at the level (0.01), which indicates that there is internal consistency between the paragraphs that measured the supply chain performance variable.

The researcher also tested the content validity of the dimensions of supply chain performance, as shown in Table (4):

Table (4): Validity of Supply Chain Performance Dimensions

Area	R	Sig.
Supply Chain Integration	0.662	**0.000
Supply Chain Efficiency	0.788	**0.000
responding to the customer	0.862	**0.000
Product Innovation	0.811	**0.000

**Statically significant at (0.01)

Table (4) shows that the correlation coefficients for the dimensions of supply chain performance as a dependent variable ranged between 0.662 and 0.862, and it is statistically significant at the level of 0.01, which indicates a strong internal consistency for the dimensions of supply chain performance.

2. The stability of the study tool:

To ensure the stability of the study tool, the internal consistency was calculated according to Cronbach's alpha equation for all study variables, as follows:

First: Stability of the independent variable (total quality management)

The researcher calculated the level of stability of the total quality management dimensions separately, and then measured the stability of all dimensions combined, according to the coefficient (Cronbach-Alpha). According to Sekaran (Sekaran, 2010, P.43), the resolution items are considered to have internal consistency and stability if the value of Cronbach's alpha coefficient reaches 70% as a minimum. Table (5) shows the results of the stability test:

Table (5): Dimensions stability of the independent variable (total quality management) using Cronbach's alpha coefficient (n = 157)

Dimension	Paragraph no.	Cronbach's alpha
Focus on the customer	6	0.841
Senior management commitment to quality	5	0.887
Focus on process improvement	5	0.906
engagement of employees in decision-making	5	0.838
TQM variable as a whole	21	0.923

The Cronbach's alpha coefficient for all dimensions of total quality management was 0.923, and the Cronbach's alpha coefficients for the dimensions of the independent variable (total quality management) separately were high, according to the results of Table (5). Where it reached 0.841 for the dimension of focus on the customer and 0.887 for the dimension of the commitment of senior management to quality, and 0.906 for the dimension of focusing on operations and 0.838 for the dimension of the worker's participation in decision-making, and based on the rule referred to previously, all values were greater than 70%, and this indicates that the paragraphs enjoy stability.

Second: Stability of the dependent variable (supply chain performance)

The stability was measured for the dimensions of the dependent variable (the performance of supply chains) separately, and then the stability was measured for each variable, according to the coefficient (Cronbach - Alpha), and Table (6) shows the results of the stability:

Table (6): Dimensions stability of the dependent variable (supply chain performance) using Cronbach's alpha coefficient (n = 157)

Dimension	Paragraph no.	Cronbach's alpha
Supply Chain Integration	6	0.788
supply chain efficiency	5	0.871
response to the customer	5	0.875
Product innovation	5	0.882
Supply chain performance variable as a whole	21	0.922

The results of Table (6) indicate that the Cronbach's alpha coefficient for all dimensions of the dependent variable (supply chain performance) was 0.922, it was 0.788 for the supply chain integration The data in Table (7) indicates that most of the study sample members were males, whose number was 114, or 72.6%, while the number of females was 43, or 27.4%.

It is also noted that the age group whose ages ranged between (less than 25 years) represented the lowest percentage among the age groups in the sample by 3.2%, while

dimension, 0.871 for the supply chain efficiency dimension, 0.875 for the customer response dimension, and 0.882 for the product innovation dimension, which refers to stability based on the above rule.

Data analysis and hypothesis testing:

First: Describe the characteristics of the study sample.

To reach an accurate description of the characteristics of the study sample, frequencies and percentages were used. The characteristics were demographic and functional data represented by (gender, age group, educational qualification, marital status, monthly income, and job title). Table (7) shows the results of the analysis for these variables.

Table (7): Distribution of the study sample according to their demographic data

Variables	Categories	REP.	%
Gender	male	114	%72.6
	feminine	43	%27.4
	total	157	%100
Age	less than 25 years	5	3.2%
	25 - under 30	22	14.0%
	30 to under 35	15	9.6%
	35 to less than 40 years	20	%12.7
	+ 40 years	95	%60.5
	total	157	%100
Qualification	high school and below	2	%1.3
	diploma	10	%6.4
	BA	120	%76.4
	postgraduate	25	%15.9
	total	2	%1.3
Marital status	unmarried	47	%29.9
	married	105	%66.9
	other	5	%3.2
	total	157	%100
Monthly income	less than 400 jd	33	%21.0
	400-less than 700 jd	58	%36.9
	700-less than 1000 jd	31	%19.7
	100 jd and more	35	%22.3
	total	157	%100
Job title	administrative employee	98	%62.4
	head of the department	52	%33.1
	boss	7	%4.5
	total	157	%100

the age group (40 years and over) constituted most of the sample members, as the number of sample members was within this category for 95 individuals, at a rate of 60.5%. As for the scientific qualification, the percentage of those who hold a bachelor's degree constituted the highest percentage among other educational levels,

reaching 76.4%, followed by those who hold a certificate (postgraduate studies), where it reached 15.9%, followed by those who hold certificates (diploma), with a percentage of 6.4%, and finally, those with a degree (high school or below), where their percentage reached 1.3%, which is the lowest percentage of those with an educational level in the study sample. With regard to marital status, most of the sample members were married, as their number reached 105, constituting 66.9%, while singles constituted 29.9%, and there were 3.2% others. As for the monthly income, most of the sample's income ranged between 400-700 dinars, where their number was 58 and their percentage was 36.9%. Most of the sample members were administrative employees, as their number reached 98, constituting 62.4%.

Analysis of the answers to the study paragraphs

To identify the estimations of the sample members working in the Jordanian public shareholding industrial companies within the upper and middle management levels on the variables and dimensions of the study, the arithmetic averages and standard deviations of their answers were calculated, and the results came as illustrated by the following tables:

First: Dimensions of the Independent Variable (Total Quality Management)

The arithmetic means and standard deviations of the responses of the study sample members on the dimensions of quality management were extracted, and Table No. (8) shows these results.

Table (8): The arithmetic mean and the relative importance of the estimates of the sample members on the dimensions of total quality management

RS.	NO.	Dimension	AM.	RI.
2	1	Focus on the customer	3.91	High
1	2	Senior management commitment to quality	3.92	High
3	3	Focus on process improvement	3.83	High
4	4	engagement of employees in decision-making	3.77	High
		TQM as whole	3.86	High

According to the data in Table (8), the sample members' estimates of the relative importance of total quality management ranged between 3.77 and 3.92, with the dimension of senior management's commitment to quality coming in first place with the highest arithmetic average of 3.92, indicating a high relative importance, followed by the dimension of focus on the customer, with a mean of 3.91 and of high relative importance, followed by the dimension of focus on improving operations, with a mean of 3.83 and of high relative importance. And in the last place came the participation of workers in decision-making with a mean of 3.77 and a high relative importance.

The data in the previous table also indicates that the arithmetic average of the sample members' estimates on the dimensions of total quality management as a whole was 3.86, with a high relative importance; that is, there is a high level of the application of total quality management in the Jordanian public shareholding industrial companies.

Second - Dimensions of the dependent variable (supply chain performance)

The arithmetic means and standard deviations of the responses of the study sample members on the dimensions of supply chain performance were calculated, and Table No. (9) shows these results.

Table (9) The arithmetic mean and standard deviation of the sample members' estimates on the dimensions of the supply chain performance variable

RS.	NO.	Dimension	AM.	RI.
1	1	Supply Chain Integration	3.90	High
4	2	supply chain efficiency	.381	High
3	3	response to the customer	3.85	High
2	4	Product innovation	.387	High
		Supply chain performance variable as a whole	3.86	High

According to the data in Table (9), the arithmetic averages of the sample members' estimates on the dimensions of supply chain performance ranged from 3.81 to 3.90, with supply chain integration ranking first with the highest arithmetic average of 3.90, indicating high relative importance, followed by product innovation, with a

mean of 3.87 and high relative importance, followed by the dimension of customer response, with a mean of 3.85 and high relative importance, followed by the dimension of supply chain efficiency, with a mean of 3.81 and high relative importance. The data in the previous table also indicates that the arithmetic mean of the sample members' estimates on the dimensions of the performance of supply chains as a whole was (3.86), with a high relative importance.

The normal distribution test

The researcher used the Kolmogorov-Smirnov (K-S) test to verify that the data that was used for the purposes of statistical analysis and hypothesis testing followed a normal distribution. The analysis referred to in Table (10) revealed that the data for the current study followed the normal distribution approach and that there were no statistical differences at the level of significance (0.05) between the distribution of variable values and the values of the normal distribution.

Table (10): Normal distribution by applying the Kolmogorov-Smirnov (K-S) test

Dimension	Test value	Sig.
Focus on the customer	0.109	0.202
Senior management commitment to quality	0.107	0.175
Focus on process improvement	0.085	0.158
engagement of employees in decision-making	0.110	0.190
Supply Chain Integration	0.155	0.290
supply chain efficiency	0.102	0.255
response to the customer	0.134	0.244
Product innovation	0.123	0.236

Non-linear interference test

The researcher used the Variance Inflation Factor (VIF) test and the permissible variance (Tolerance) to verify the level of linear overlap between the dimensions of the independent variable. Where it was found that the values of the variance inflation factor (VIF) are less than (5) and that the values of the permissible variance are greater than (0.01). This is based on (Malhotra, 2010, p. 485).

Table (11): Results of the linear overlap test between the dimensions of the independent variable

Variables	Collinearity Statistics	
	VIF	Tolerance
Focus on the customer	2.661	0.376
Senior management commitment to quality	2.045	0.489
Focus on process improvement	1.221	0.819
engagement of employees in decision-making	1.352	0.740

Testing the independence of the dimensions of the independent variable

The Pearson correlation coefficients matrix was calculated to find out the relationship between the study variables, with the aim of revealing the existence of a linear correlation between them. Table (12) shows the results of the correlation coefficients between the variables as follows:

Table (12) matrix of correlation coefficients between the variables in the study.

Variables	1	2	3	4
Focus on the customer	1			
Senior management commitment to quality	0.675**	1		
Focus on process improvement	0.763**	.860**0	1	
engagement of employees in decision-making	0.667**	0.381**	0.566**	1

Table (12) shows that most of the correlations between the dimensions of the study are significant and statistically significant at the level of significance ($\alpha \leq 0.05$), and that the correlation values between the dimensions of the independent variable were less than 0.90, and thus the data judged that there is no complete correlation between the dimensions of the independent variable and the dimensions of other variables (Barclay et al., 1995; Hair et al., 1998).

Indicators of the quality of match between the model and the study data

The quality indicators for matching the constructivist model of the study were extracted as they are in Table (13).

Table (13), indicators of the quality of conformity of the model with the data of the study.

Indicator	AS	IV	Result
(CMIN/DF)	< 3	1.97	Accepted
(GFI)	> 0.90	0.95	Accepted
(AGFI)	> 0.90	0.93	Accepted
(CFI)	> 0.90	0.91	Accepted
(RMSEA)	< 0.08	0.05	Accepted

CMIN/DF: Chi-square/degrees of freedom), GFI: Goodness of Fit Index, AGFI: Adjusted Goodness of Fit Index, CFI: The comparative fit index, RMSEA: root mean square error of approximation.

Table (13) shows that all indicators in the model came with acceptable values, and the chi-square ratio (CMIN/DF) was 1.97, which is less than 3, and the GFI value was 0.95, which is greater than the minimum permissible value. 0.90 and AGFI value was 0.93, which is also greater than 0.90. Also, CFI value is 0.91, which is greater than 0.90. The value of the root square error of approach (RMSEA), which indicates an acceptable convergence error, was 0.05, which is less than 0.08. Based on these results, the hypotheses of the study are tested without any statistical problems.

Hypothesis testing
main hypothesis:
H01: There is no statistically significant effect at the significance level ($α≤0.05$) for total quality management with its dimensions (customer focus, senior management commitment to quality, focus on improving operations, and employee participation in decision-making) on the performance of supply chains with its combined dimensions (integration of chains, supply chain efficiency, customer responsiveness, product innovation) in Jordanian public shareholding industrial companies.

The researcher used multiple regression analysis to determine the impact of the dimensions of total quality management (customer focus, senior management commitment to quality, focus on process improvement, and employee participation in decision-making) on the performance of supply chains in Jordanian public shareholding industrial companies, as shown in Table (14).

Table (14) Multiple regression analysis of the impact of total quality management dimensions on the performance of supply chains

IV	Model Summery		ANOVA			Coefficient				
	R	R²	F	D.F.	Sig. F*	Statement	β	SD	t	Sig. F*
Supply chain performance	0.774	0.60	56.95	4	0.00	Focus on the customer	0.438	0.083	5.26	0.00
						Senior management commitment	0.181	0.091	3.33	0.00
						Focus on process improvement	0.470	0.087	5.23	0.00
						Staff engagement	0.190	0.058	3.29	0.00

*Statistically significant at ($α ≤ 0.05$)

The results of Table (14) indicate that the correlation coefficient (R = 0.774) indicates the positive and strong relationship between the independent variable and the dependent variable, and the impact of the independent variables (the dimensions of total quality management) on the dependent variable (the performance of supply chains) is a statistically significant effect. Where the calculated F value was (56.95), with a significance level (Sig = 0.00), which is less than 0.05, as it appeared that the value of the coefficient of determination (R2 = 0.60), which indicates that (60.0%) of the variance in (supply chain performance) can be interpreted through the variance in the (Dimensions of Total Quality Management). As for the coefficients table, it showed that the value of β in the dimension (focusing on the customer) reached 0.438 and that the value of T in it is 5.26, with a level of significance (Sig = 0.00), which indicates that the effect of this dimension is significant, while the value of β At the dimension (commitment of senior management to quality), it reached 0.181, and its T-value is 3.33 with a significance level of Sig = 0.00), which indicates that the effect of this dimension is significant. The dimension (focus on improving operations) had a value of 0.470 and a T value of 5.23, with a level of significance (Sig = 0.00), indicating that the effect of this dimension is significant. β significant.

Through the indicated β values, it is clear that the focus on improving operations as one of the dimensions of total quality management had the greatest impact on the

performance of supply chains.

And based on the results that have been reached, it rejects the first main null hypothesis and accepts the alternative hypothesis that says: There is a statistically significant effect at the level of significance ($\alpha \leq 0.05$) for total quality management with its dimensions (focus on the customer, commitment of senior management to quality, and focus on improving operations; the participation of workers in decision-making) in the performance of supply chains with its combined dimensions (supply chain integration, supply chain efficiency, customer response, product innovation) in Jordanian public shareholding industrial companies.

From this first main hypothesis, the following sub-hypotheses emerged:

First: the first sub-hypothesis

H01-1: There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of customer focus on the performance of supply chains in Jordanian public shareholding industrial companies.

Table (15): Results of the simple regression test for the effect of customer focus on supply chain performance

DV	Model Summery		ANOVA			Coefficient				
	R	R²	F	D.F.	Sig. F*	Statement	β	SD	t	Sig. T*
Supply chain performance	0.747	0.558	195.93	1	0.000	Focus on the customer	0.747	0.049	13.99	0.000

The results of Table (15) indicate that the value of R = 0.747, which means that there is a correlation relationship of 74.7%, which is considered high between focus on the customer as one of the dimensions of Levantine quality management and human resources performance.

It appears that the value of the coefficient of determination R2 = 0.558, and this means that the dimension of focus on the customer has explained the amount (55.8%) of the variance in the performance of supply chains and the percentage of 44.2% as a result of other factors not addressed in this study. It also appears from the coefficients table that the value of (F) reached 195.93 at the level of significance (sig = 0.000), and this confirms the significance of the regression at the level of ($\alpha \leq 0.05$) and at one degree of freedom.

The coefficients table also shows that the value of β = 0.747, that is, the change in one unit in one of the dimensions of the independent variable (customer focus) leads to a change of 74.7% in the dependent variable (supply chain performance), and that the value of T = 13.99 at the level of significance (sig = 0.000) and this confirms the significance of the coefficient at the level ($\alpha \leq 0.05$). Based on the foregoing analysis, the first sub-null hypothesis was rejected and the alternative sub-hypothesis was accepted: There is a statistically significant effect at the significance level ($\alpha \leq 0.05$) of customer focus on the performance of supply chains in Jordanian public shareholding industrial companies.

Second: the second sub-hypothesis

H01-2: There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) the commitment of senior management to quality in the performance of supply chains in the Jordanian public shareholding industrial companies.

Table (16) Results of the simple regression test for the effect of the commitment of senior management to quality on the performance of supply chains

DV	Model Summery		ANOVA			Coefficient				
	R	R²	F	D.F.	Sig. F*	Statement	β	SD	t	Sig. T*
Supply chain performance	0.561	0.315	71.25	1	0.000	Senior Management commitment	0.561	0.057	8.44	0.000

The results of Table (16) indicate that the value of (R = 0.561), which means that there is a correlation relationship of 56.1%, which

is considered a medium between the commitment of senior management to quality as one of the dimensions of total quality management and the performance of supply chains. It appears that the value of the coefficient of determination is (R2 = 0.315), which means that the dimension of the commitment of senior management to quality has explained an amount of 31.5% of the variance in the performance of supply chains and 68.5% as a result of other factors not addressed in this study.

It also appears from the coefficients table that the value of (F) reached 71.25 at the level of significance (sig = 0.000), and this confirms the significance of the regression at the level ($\alpha \leq 0.05$) and at one degree of freedom.

The coefficients table also shows that the value of $\beta = 0.561$, meaning that the change in one unit in one of the dimensions of the independent variable (the commitment of senior management to quality) leads to a change of 56.1% in the dependent variable (supply chain performance), and that the value of (T = 8.44) At the level of significance (sig = 0.000), this confirms the significance of the coefficient at the level of ($\alpha \leq 0.05$).

Based on the above analysis, the second sub-null hypothesis was rejected and the alternative sub-hypothesis was accepted, which says: There is a statistically significant effect at the significance level ($\alpha \leq 0.05$) of the commitment of senior management to quality in the performance of supply chains in the affiliated Jordanian public shareholding industrial companies.

Third: the third sub-hypothesis
H01-3: There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) focusing on improving operations in the performance of supply chains in Jordanian public shareholding industrial companies.

Table (17): Results of the simple regression test for the effect of focusing on improving operations in the performance of supply chains

DV	Model Summery		ANOVA			Coefficient				
Supply chain performance	R	R²	F	D.F.	Sig. F*	Statement	β	SD	t	Sig. T*
	0.644	0.414	109.58	1	0.000	Focus on process improvement	0.644	0.044	10.46	0.000

The results of Table (17) indicate that the value of R = 0.644, and this means that there is a correlation relationship of 64.4%, which is considered a medium between the focus on improving operations as one of the dimensions of total quality management and the performance of supply chains. It turns out that the value of the coefficient of determination R2 = 0.414, which means that after focusing on improving operations, it explained 41.4% of the variance in the performance of supply chains and 58.6% as a result of other factors not addressed in this study. It also appears from the coefficients table that the value of (F) reached 109.58 at the level of significance (sig = 0.000), and this confirms the significance of the regression at the level ($\alpha \leq 0.05$) and at one degree of freedom.

The coefficients table also shows that the value of $\beta = 0.644$, that is, the change in one unit in one of the dimensions of the independent variable (focus on improving operations) leads to a change of 64.4% in the dependent variable (supply chain performance), and that the value of T = 10.46 at the level of Significance (sig = 0.000) and this confirms the significance of the coefficient at the level of ($\alpha \leq 0.05$).

Based on the foregoing analysis, the third sub-null hypothesis was rejected and the alternative sub-hypothesis was accepted which says: There is a statistically significant effect at the significance level ($\alpha \leq 0.05$) focusing on improving operations in the performance of supply chains in Jordanian public shareholding industrial companies.

Fourth: the fourth sub-hypothesis
H01-4: There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of employees' participation in decision-making

in the performance of supply chains in Jordanian public shareholding industrial companies.

Table (18): Results of the simple regression test for the impact of workers' participation in decision-making on the performance of supply chains

DV	Model Summery		ANOVA			Coefficient				
Supply chain performance	R	R²	F	D.F.	Sig. F*	Statement	β	SD	t	Sig. T*
	0.629	0.395	101.26	1	0.000	Staff engagement	0.629	0.049	10.06	0.000

The results of Table (18) indicate that the value of R = 0.629, which means that there is a correlation relationship of 62.9%, which is considered a medium between the participation of workers in decision-making as one of the dimensions of total quality management and the performance of supply chains.

It turns out that the value of the coefficient of determination R2 = 0.395, and this means that the dimension of workers' participation in decision-making has explained an amount of 39.5% of the variance in the performance of supply chains, and 60.5% as a result of other factors not addressed in this study.

It also appears from the coefficients table that the value of (F) reached 101.26 at the level of significance (sig =0.000), and this confirms the significance of the regression at the level of (α≤0.05) and at one degree of freedom.

The coefficients table also shows that the value of β = 0.629, that is, the change in one unit in one of the dimensions of the independent variable (the participation of workers in decision-making) leads to a change of (62.9%) in the dependent variable (supply chain performance), and that the value of T = 10.46 at the level of significance (sig = 0.000), and this confirms the significance of the coefficient at the level of (α ≤ 0.05).

Based on the foregoing analysis, the fourth sub-null hypothesis was rejected and the alternative sub-hypothesis was accepted, which says: There is a statistically significant effect at the significance level (α≤0.05) of employees' participation in decision-making in the performance of supply chains in Jordanian public shareholding industrial companies.

DISCUSSING FINDINGS AND RECOMMENDATIONS

First - Discussing the dimensions of total quality management:

The results of the study indicated that the relative importance of the dimensions of the independent variable (total quality management) was generally high, as the dimension of the commitment of senior management to quality came in first place, with the highest arithmetic average of 3.92, and with a high relative importance, followed by the dimension of focus on the customer, with an arithmetic average of 3.91, and with a high relative importance.

The focus on improving operations was followed by the focus on improving operations, with a mean of 3.83, with a high relative importance, and in the last place came the participation of workers in decision-making, with an average of 3.77, with a high relative importance.

This indicates that the Jordanian public shareholding industrial companies are aware of the importance of total quality management, as quality management is based on doing business in business organizations correctly the first time and preventing errors.

Total quality management is also considered a preventive strategy, aimed at reducing costs and reducing the time required to complete tasks and achieve goals by focusing on the customer and the commitment of senior management to apply the tools and practices of total quality, as well as focusing on improving operations, reducing non-value-added time, and increasing customer satisfaction.

reducing working capital as well as implementing ERP, changes in technology, or the introduction of e-business. In addition

to the participation of employees in decision-making and for this purpose, Jordanian public shareholding industrial companies seek to provide a culture of applying total quality management and continuous planning for the path of total quality programs to achieve their strategic goals.

This result is due to the interest of the Jordanian public shareholding industrial companies in everything that leads to achieving goals and organizational success through their adoption of administrative methods with effective results, including total quality management, where public shareholding industrial companies conduct survey studies to determine the needs and desires of customers on an ongoing basis. Providing sufficient requirements for the implementation and application of total quality management related to the client and the use of modern technologies to facilitate dealings with them.

This result agreed with the result of the Khreisat study (2020), the results of which showed the presence of high levels of the arithmetic mean for the dimensions of total quality management practices (leadership, strategic planning, customer focus, team work, operations management, information and analysis), and also agreed with the result of the study by Bader and Al-Madhoun, the results of which showed a high interest in applying the principles of quality.

Second: Discussing the dimensions of supply chain performance:
The results showed that the relative importance of the dimensions of the performance of supply chains was high, with a mean of 3.86, as the dimension of supply chain integration ranked first, with the highest arithmetic mean of 3.90 and of high relative importance, followed by the dimension of product innovation, with an arithmetic average of 3.87 and of high relative importance, which was followed by the dimension of customer response, with a mean of 3.85 and of high relative

importance, followed by the dimension of supply chain efficiency, with a mean of 3.81 and high relative importance.

The researcher attributes this result to the Jordanian public shareholding industrial companies' awareness of everything that leads to raising the level of this performance, because efficiency and effectiveness enhance the performance of supply chains for business organizations in general, and public shareholding industrial companies in particular, by enhancing their growth strategies, improving their competitive position, and determining the performance of the business they do, Therefore, improving the performance of supply chains is a must in order to ensure continuity in the market and to achieve the desired market share, taking into account the innovative performance of the products provided.

For this purpose, the Jordanian public shareholding industrial companies are working to ensure the compatibility of all their operations related to suppliers and customers, and to cooperate with all parties in the main supply chain in an effective manner. Where supply chain management plays a crucial role in achieving competitive advantage in the global business environment for companies, companies are also interested in supply chains because they need techniques, methods, and methods that enable them to achieve their goals and become competitive locally and globally. This result was in agreement with the results of the Khuraisat study (2020), the results of which showed the presence of high levels of supply chain performance dimensions (supply chain resilience, supply chain integration, customer response, product innovation).

Third: Discussing the results of the study's hypotheses analysis
The results related to the first main hypothesis showed that there is a statistically significant effect of all dimensions of total quality management on the performance of supply chains in

Jordanian public shareholding industrial companies, where the coefficient of determination was 0.60, the regression values were high for all dimensions, and the level of statistical significance was less than 0.05.

This means that Jordanian public shareholding industrial companies follow strategies that enable them to enhance the dimensions of total quality management represented by (customer focus, senior management commitment to quality, focus on improving operations, participation of employees in decision-making), and that total quality management with its dimensions affects the performance of resources human beings have a statistical impact.

The researcher attributes this result to the fact that the application of the dimensions of total quality management by the Jordanian public shareholding industrial companies works to increase and improve the performance of supply chains. Focusing on the customer as one of the dimensions of total quality management is the primary key to the efforts of total quality management, as business organizations need to know what internal and external customers want or expect from them in order to produce and deliver quality and improve processes that contribute to improving the performance of supply chains.

The commitment of senior management to quality, which is one of the main dimensions of total quality management, is the most prominent concept that organizations support when providing their products or services in order to reach high-performance systems, in addition to their role in achieving success and viability, thus increasing and improving the performance of supply chains regardless of their strategic objectives. With regard to the focus on operations, which includes the presentation and clarity of goals and objectives, reducing non-value-added time, increasing customer satisfaction, reducing working capital, as well as implementing organization resource planning, changes in technology, or the introduction of e-business that contribute to improving the efficiency of supply chains.

The participation of employees in decision-making as one of the dimensions of total quality management can contribute to enhancing the performance of supply chains for business organizations through a proper understanding of each step of product realization, starting from product design and identifying the necessary raw materials through production processes and ending with the delivery of the product according to the required and desired specifications to customers. In addition, the participation of employees in decision-making allows them to take individual responsibility to develop ways that lead to their work by delegating responsibilities and powers to make decisions at all levels of the organization, all of which can lead to improved performance of supply chains.

This result is consistent with the Khraisat study (2020) that found a statistically significant impact of total quality management practices on the performance of supply chains in pharmaceutical companies in Jordan. It also partially agrees with regard to the impact of total quality management with many studies whose results indicate the existence of a relationship or impact of the dimensions of total quality management on some variables, such as Nassari (2021), which indicated that there is a statistical significance between total quality and the performance of production systems in food industry companies listed on the stock exchange. The result of the current study partially agreed with regard to the impact of total quality management with that of Haddad (2020), which showed a statistically significant effect at the level of significance ($\alpha \geq 0.05$) for total quality management on the performance of Jordanian food companies, and with (Priporas and Psychogios (2016), which showed a significant impact of total quality management in the service industry in Greek companies.

Recommendations

Based on the results of this study, the researcher put forward a number of recommendations, as follows:

1. Inviting Jordanian public shareholding industrial companies to continue to improve total quality management dimensions by understanding their importance in order to increase efficiency and effectiveness, achieve strategic growth and business success, and develop and improve supply chain performance.

2. Enhancing the trend among Jordanian public shareholding industrial companies to keep pace with developments in the field of industries in the countries of the world, especially developed countries, and to respond to all segments of consumers' needs, requirements, preferences, and desires through diversification of products and the involvement of workers in decision-making.

3. Creating platforms for Jordanian public shareholding industrial companies and suppliers to share and exchange knowledge within databases in order to improve supply chain performance.

4. Raising the level of interest from the departments of Jordanian public shareholding industrial companies by providing their employees with continuous feedback on their performance and involving them in decision-making so that they can be at a high level of responsibility.

5. The importance of increasing interest in the use of ERP systems in Jordanian public shareholding industrial companies, as well as broadening the scope of application by connecting supply chains with total quality management practices.

6. The importance of conducting future studies related to total quality management on other variables such as organizational success or strategic performance.

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