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Measuring the Practice Level of Total Quality Management and its Impact on Employees Performance at ESNAD factory

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Abstract: The main objective of this study is to measure the practice level of Total Quality Management (TQM) and its impact on employees' performance at the organization in Saudi Arabia by selecting a local organization to assess and evaluate the following sub-objectives. i) evaluate employees' awareness of TQM principles that affects the possibility of applying TQM in the organization. ii) Critically evaluate if the organizational culture moderates the relationship between TQM and the organization's performance. iii) define obstacles seen by employees that might affect the possibility of applying TQM. To prepare research questions and hypotheses, this study used a multiphase mixed method that included both quantitative and qualitative methodologies to reach the objectives of this study. A comprehensive literature review introduced the following topics i) the Conceptual framework of TQM. ii) The development of quality management. iii) The critical success factors of TQM implementation. iv) TQM implementation challenges. The primary data is collected via an online questionnaire, while the secondary information is collected from scientific scholars' databases. The research revealed a statistically significant relationship between employees' awareness of TQM principles affecting the possibility of applying TQM in the organization and a substantial connection between TQM practice and ESNAD factory performance. Eventually, there was a statistically significant relationship between Obstacles seen by employees affecting the possibility and chances of applying TQM in the organization. There is no statistically significant relationship between Obstacles seen by ESNAD's employees acting the likelihood and opportunities of applying TQM in the ESNAD factory. Furthermore, the research found no statistically significant relationship between Organizational culture moderates the relationship between TQM and organizational performance.

Keywords: Total Quality Management, Employees Performance, Continuous Improvement, Competitive Advantage

I. INTRODUCTION

The shape of the market is dynamic and competitive and a rapidly changing and highly sophisticated business environment (Eltawy & Gallear, 2017). Organizations will continually face the changes, rapid technological evolution, globalization, competition races, disruptive business innovations, emerging new markets, where it constantly changes to affect organizations, both big and small size organization (Žitkienė & Deksnys, 2018). Organizations are obligated to adapt to this situation, requiring a very demanding product or service quality, quick delivery, and competitive pricing models. Organizations globally have strategically applied quality to attract and win customers. Customer needs are persistently evolving in parallel with the diversification of lifestyles, and a high stander of quality and functionality is anticipated of every product and service. Organizations are required to reconsider their focus on how much they are making but on how well they are meeting customers' demands and expectations (George & Weimerskirch, 1998). "*The quality perception is different between one and another, including the definition of the quality itself as described*" in table 1 (Zairi, 1991).

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Regardless of different definitions, quality must be delivered to the customer, and it must be maintained to satisfy customers and support business sustainability. Organizations are required to implement a comprehensive concept on how they can maintain the level of satisfaction of their customer by delivering superior quality of their products and services.

Organizations are required to adopt a strategy that will concentrate on improving the business's operational activities to overcome the competition in parallel with improving the competitive advantages (Kantardjieva, 2015). Organizations should consider the Total Quality Management theory and practice (TQM) to defeat those challenges. Numerous organizations around the group widely adopt TQM, and it has successfully applied and benefited the organization significantly.

Applying and using the concept of quality management helped the Japanese nation to rebuild the country after WW-II. They have followed the Total Quality Management by using the four stages, which are categorized as follows: (1) Quality inspection, (2) Quality control, (3) Quality assurance, and (4) Total Quality Management (Dahlgaard *et al.*, 2002).

TQM's approach focuses on improving the process's effectiveness and responsiveness in meeting the customer requirement as part of the organization's excellence goals in achieving customer satisfaction (Ramlawati & Putra, 2018). To ensure the effectiveness of the concept implementation in the organization, all components must work together as a team. Each part, activity, and individual in the organization affects and is affected by others (Oakland, 2003).

TQM as a philosophy for modern competitiveness and discussed the various contributions in the area of quality management which have propelled its prominence to today's levels of competitiveness (Zairi, 1991). The implementation of TQM is divided into three different stages (Fitriani, 2019): (1) the first stage is the preparation, (2) the second stage is planning, and (3) the final stage is Execution. Those three stages must be implemented and managed perfectly with the involvement of both the management and employees, and other factors that should be considered are training and communication (Kumar & Shanmuganathan, 2019). TQM must be considered a long-term process, the vision to keep looking into the future, not simply applying it to meet short-term objectives. Organizations should always plan for their future presence and sustainability (Rogers, 2013).

Research Problem

1. ESNAD Company is the first manufacturer for mixing and packing spices in Saudi Arabia. The company was established in 1989; presently, ESNAD has two production plants, one main warehouse & five distribution centers around Saudi Arabia. ESNAD commercial team complains about late delivery of finished goods items from the Factory. Another issue is that sometimes production process times take longer than planned, affecting company revenues, and allowing other competitors to fill this gap.
2. Furthermore, ESNAD Commercial team complains that there is over-stock from some lower moving items & made dumping stock in their distribution centers so they will not be able to receive other fast-moving items in the right quantity & made the distribution center warehouse crowded.
3. ESNAD Factory complained about poor forecasting that submitted by the Commercial Team, the Factory not able to make a proper plan for production & purchase raw materials, also can't give the right quantity at the right time due to production proceeds
4. ESNAD Factory has two plants for production:
    - One for heavy operation (grinding, sieving, roasting, treatment, Spices cleaning & sorting), these types of operations take a long time. The heavy operation must be done before mixing a maximum of one to two days to save flavor, aroma & color of spices.
    - Second for preparation raw materials mix, mixing & packing.

5 With weak forecasting, the Factory will face delays in production due to a late move in the production process from one phase to another. Each production phase will take its time to depend on the nature of raw materials inside the product.

6 On the other hand, most of the raw materials imported for serval places in the world & its take time to bring it, if any short happen in one-row materials, not all item that contains it will produce until receiving it again.

7 However, this study has a timeframe limitation, resources limitation. Accordingly, the selection of investigating the Quality Engineering applied in ESNAD Company by studying the dilemma mentioned above and related to the Practice Level of Total Quality Management. Its Impact on Employees Performance at ESNAD factory might draw a road map to solve the problem.

Scope of Research

The scope of the research is within the context of ESNAD Company, Jeddah, Saudi Arabia, which focuses on Practice Level of Total Quality Management and its Impact on Employees Performance at ESNAD factory. Moreover, The Statistical and detailed analysis of the data collection, which described in section 3 ("Research analysis").

Importance of Research

The relationship between TQM and performance has been studied and investigated by many scholars. However, examining the relationship between TQM and performance scholars has applied various performance types in operational, financial, innovative, and quality performance. Even though the effects of TQM on several performance types are inconsistent, quality performance usually suggests strong and positive relations. Then again, advocates of TQM suggest that proper implementation well produces higher quality products and services. According to Deming, quality is the principal determinant of success in competitive environments.

Since 1989, ESNAD started its operation in only packing row spices then moved to the mixture and food additives. To face the huge demand from the market, need to have a strong forecast who led the commercial division to increase the sales and make all ranges available in the market. This research will lead to re-study ESNAD divisions and select the proper forecast method led to achieving ESNAD target. Moreover, to organize the process & operation for all divisions, made strong supply chain, re-define the relation between ESNAD division & ESAND with the market, also to meet the 2030 Saudi Arabia vision by increase the number of local produce items & raise the level of national industry.

Research Objectives

This study aims to measure the Practice Level of Total Quality Management and its Impact on Employees Performance at the ESNAD factory by assessing and evaluating the following objectives:

- Critically evaluate and analyze how employees' awareness of TQM principles affects the possibility of applying TQM in the ESNAD factory awareness.
- Critically evaluate and analyses if there is a relationship between TQM practice and ESNAD factory performance.
- Critically evaluate and analyses if the Organizational culture moderates the relationship between TQM and ESNAD factory performance.
- Critically evaluate and analyses the Obstacles seen by ESNAD's employees affect the possibility and chances of applying TQM in the ESNAD factory

Research Hypothesis

According to the research model, the study objective is to test the following hypotheses against a significance level of [0.05]:

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- H1: The extent of employees' awareness of TQM principles affects the possibility of applying TQM in the ESNAD factory
    - H1.0: There is no statistically significant relationship between employees' awareness of TQM principles affects the possibility of applying TQM in the ESNAD factory.
    - H1.1: There is a statistically significant relationship between employees' awareness of TQM principles affects the possibility of applying TQM in the ESNAD factory.
- H2: The relationship between TQM practice and ESNAD factory performance.
    - H2.0: There is no statistically significant relationship between TQM practice and organizational performance.
    - H2.1: There is a statistically significant relationship between TQM practice and ESNAD factory performance.
- H3: Organizational culture moderates the relationship between TQM and ESNAD factory performance:
    - H3.0: There is no statistically significant relationship between Organizational culture moderates the relationship between TQM and ESNAD factory performance.
    - H3.1: There is a statistically significant relationship between Organizational culture moderates the relationship between TQM and ESNAD factory performance.
- H4: Obstacles seen by ESNAD's employees affect the possibility and chances of applying TQM in the ESNAD factory.
    - H4.0: There is no statistically significant relationship between Obstacles seen by ESNAD's employees affecting the possibility and chances of applying TQM in the ESNAD factory.
    - H4.1: There is a statistically significant relationship between Obstacles seen by ESNAD's employees affect the possibility and chances of applying TQM in the ESNAD factory.

II. LITERTURE REVIEW

Various authors and practitioners have defined complete quality management based on their industry viewpoint. According to Deming (1986), TQM is a management philosophy centered on customer satisfaction that satisfies current and future requirements and expectations. Additionally, according to Pfau (1989) and Oakland (1993), TQM is a way to constantly enhance the quality of services given by involving all departments and levels of the organization. Furthermore, TQM is defined by Nicol (1997) as a comprehensive system approach (not a distinct program) that spans all departments and functions, engaging all personnel at all levels and extending to the customer and supply chains. According to Miller (1996), TQM is an ongoing process in which senior management does what is necessary to enable every employee in the organization to fulfill all duties to establish and attain standards that meet or even surpass the demands and expectations of both internal and external consumers. Dilber et al. (2005) define TQM as an action plan to develop and deliver services that are consistent with clients' expectations through better, faster, cheaper, and easier processing than other rivals through the engagement of everyone in the organization under top management's guidance. According to Sadikoglu and Zehir (2010), TQM is a systematic quality improvement strategy that strives to increase a company's quality, productivity, profitability, and customer happiness. TQM is a style of doing business that attempts to enhance an organization's competitiveness by continuously improving the quality of its services, products, processes, workers, and environments (Goetsch and Davis, 2016).

In summary, TQM is a management philosophy, method, or style of doing business that focuses on continually improving everything associated with that firm, such as the quality of its services, processes, personnel (at all levels), and environments.

Although there has been an interest in TQM philosophy since the 1950s, when Deming proposed fourteen principles for its use, there is no universally accepted definition (Hackman and Wageman, 1995). On the other hand, many scholars have presented a variety of TQM definitions, as illustrated in the table 1.

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Table 1. Total Quality Management Definitions

SN	TQM Definitions	Author(s)
1	"TQM is a total organizational approach for meeting customer needs and expectations that involves all managers and employees in using quantitative methods to improve continuously the organization ‘s processes, products and services."	Milakovich (1990)
2	"TQM process as a total focus on meeting and exceeding customer’s expectations and significantly reducing costs resulting from poor quality by adopting a new management system and corporate culture."	Berry (1991)
3	"TQM as procedures and techniques aim to reduce defects of a production process/service delivery."	Steingrad and Fitzgibbons (1993)
4	"TQM is an integral system aimed to achieve and sustain high quality output, focusing on the maintenance and continuous improvement of operations and defect prevention at all levels and functions in the organization in order to satisfy or exceed customer expectations."	Flynn et al., (1994)
5	"TQM as a concept that focuses on managing the total organization to deliver quality to customers."	Daft (1997)
6	"TQM is the organizational culture committed to customer satisfaction through continuous improvement; this culture varies from country to country and from industry to industry but has specific core principles that can be applied to ensure the largest possible market share, increase profits, and reduce costs"	Kanji and Wallace, (2000).
7	"TQM is a comprehensive organizational intervention requiring a major adaptation of the entire management system"	Hackman & Wageman (1995)
8	"TQM is a structured, systematic process for creating organization wide participation in planning and implementing continuous improvement in quality"	Shortell, Levin, O’Brien & Hughes, (1995)
9	"TQM is managing the entire organization so that it excels in all dimensions of products and services that are important to the customer”	Chase & Aquilano, (1992)
10	TQM is a method for ridding people’s lives of wasted effort by involving everyone in the processes of improvement; improving the effectiveness of work so that the results are achieved in less time	Oakland, (1989)

Evolution of quality management

According to Dale (2003), Quality inspection, quality control, quality assurance, and comprehensive quality management are the four stages of quality management consequence.

Stage (1): Quality inspection stage

Simple inspection-based systems have been used to begin quality management. This system evaluates the manufacturing process's inputs, outputs, and assemblies. It is primarily carried out by personnel who have been hired, particularly for this reason. One or more properties of a product are studied, measured, or tested and compared to stated requirements to determine whether it complies with specifications or performance criteria. Work that does not meet specifications may be revised or result in a claim. Inspection is sometimes used to rate finished products. The method is an after-the-fact screening process with no prevention content other than perhaps identifying non-conforming products from suppliers, operations, or workers. Simple inspection-based systems are usually entirely internal, with no direct involvement of suppliers or other outside parties (Dale, 2003).

Stage (2): Control Quality

Control became approaches to achieve higher process control and less non-conformance under a quality control system. Performance data collecting, feedback to previous stages in the process, and self-inspection are all standard features of such systems. While screening inspection is still the primary means of preventing products that do not meet specifications from being sent to consumers, quality control procedures improve process control and reduce non-conformance (Dale, 2003). This process in manufacturing includes the following steps: first, establishing specific standards for manufacturing performance, usually through the plan and specifications; second, measuring deviations from the

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standard; third, correcting or minimizing adverse variance; and finally, planning for improvements in the standards themselves and conformance with the standards.

Stage (3) Quality assurance

In BS, EN, and ISO 8402, quality assurance is described as "all those planned and systematic procedures essential to provide reasonable confidence that a product or service will satisfy stated quality requirements." The transition from product to system quality ushered in the quality assurance stage. In this stage, an organization establishes a system for monitoring and controlling its operations, which is then audited to confirm that it is adequate in both design and execution. This level is marked by the usage of quality manuals, processes, work instructions, quality planning, and quality audits, among other things. According to McCabe (1998), the main distinction is that quality assurance is based on prevention, whereas quality control is based on inspection.

Stage (4) Total quality management

The most significant level of quality management is total quality management (TQM), which entails applying quality management principles to all parts of the business. TQM is defined by ISO 8402:1994 as a quality-focused management technique that involves all employees of the organization and aims for long-term success. According to TQM, the concepts of quality management must be used in every branch and at every level of a business. Customer satisfaction and advantages to all members of the organization as well as society are the means through which this is accomplished (Dale, 2003).

Critical success factors of TQM implementation

An exhaustive assessment of TQM literature from quality expert, quality award models, other quality management research, and a study of the local construction and manufacturing industry led to this conclusion. The essential variables contributed to the effectiveness of TQM implementation in building projects as presented in figure 1.

Figure 1. success factors of TQM implementation

Leadership Characteristics

One of the most significant components in implementing TQM in organizations is top management leadership. Leadership, which is regarded as the most influential TQM aspect, has an impact on the organization's other parts. The level of visibility and support was given by management to the implementation of overall quality management is essential to its success.

To successfully adopt TQM in any business, top management must believe in it and be committed to it and exhibit that conviction and commitment. Commitment is the bedrock of any successful comprehensive quality management program.

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Many studies, such as (Zhang, 2001); (Antony et al, 2002); (Jung and Wang 2006); (Hides et al, 2000); (Chow and Lui, 2001); and (Sarros et al, 2006), explore leadership success variables. The following are the critical factors identified in these studies:

- Support from senior management.
- The commitment of employees and middle management.
- Develop a long-term vision
- Top management's ability to distribute the responsibilities for quality on the department heads.
- Ability to delegate quality-control responsibility to department heads
- Top management places a premium on quality in relation to cost and schedule goals.
- Collaboration with customers and vendors
- Organizational culture that promotes total quality
- Participation in the definition, budgeting, and measurement of total quality objective tasks

Managing Recourses

Resource management refers to a set of TQM methods, procedures, and activities that aim to achieve corporate goals by combining the demands of consumers, the business, and the people that work there. Both (Abu-Hamatteh et al., 2003) and (Bryde and Robinson, 2007) identified resource development and management as a critical component of TQM implementation. This factor, which includes sub-factors, focuses on developing and implementing a transparent system for planning, developing, improving, and reviewing the resources, which include people, knowledge, financial, materials, and technology that are required to succeed. Table 2 illustrate resource management sub-factors.

Table 2 Resource Management Sub-factors

Human resources	• Information collection and analysis methodology • Welfare program • Training evaluations and evaluating • Incentives system for employees
Information resources	• Information system applied • A program for defining the requirements for an information • System Information system covering most of the duties
Financial resources	• Methodology of preparing budget. • Plans to increase income cut down on expenditure. • Corrective action to control project cost. • Meet the budget
Material resources	• Specifying the required material • Storage system • System for the best use of material resources e
Material resources	• Defining the requirement for new technologies. • Technology transfer and an emphasis on research and development • System for the best use of technology • Taking corrective action to improve the control of technical needs

Strategic Planning

Quality Strategies and Plans are actions that define the goals and requirements for putting TQM into practice. When quality plans are created, the methods for putting them into action should be carefully thought out. The plans should be written in such a way that they could be put into action, with an emphasis on resolving the primary issues. If they cannot be put into practice, they are pointless.

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Because of its importance, all international models such as Deming, Juran's, and EQA's focused on it (Zhang, 2001). Figure 2 present the strategic planning elements.

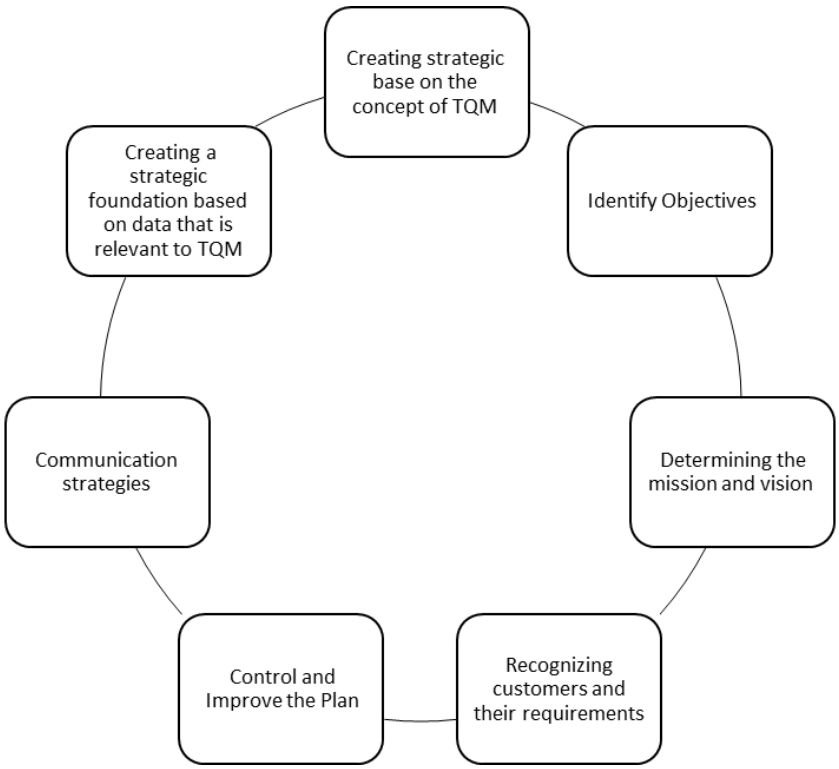

Figure 2 Strategic Planning Elements.

Process management

This component examines the company's dedication to developing and implementing a thorough methodology for planning, executing, and developing work systems for all of the company's activities. This element focuses on the company's organizational structure and the goal of optimal coordination efficiency at all levels. According to Abu-Hamatteh et al. (2003), it emphasizes the need to have a complete technique for managing the affairs and expectations of consumers. This component also underscores the need for having good policies, processes, documents, and organizational methods. According to Abu-Hamatteh (2003), there are three essential elements in process management, according to Abdul-Aziz (2002); and Tan and Lu (1995) each of which has several sub factors, as illustrated in the figure 3.

Customer satisfaction

One of the most crucial aspects of TQM is customer satisfaction, which promotes overall satisfaction through product improvement, likewise increasing the overall performance. On the other hand, organizations differ from different industries in terms of TQM implementation due to their inability to precisely define consumer needs. The consumer requirements must be recognized through TQM implementation in order to achieve their satisfaction. The owner of the project could be defined as a customer. The customer is simply the person who purchases a product or service. Contractors and partners, project directors, project team members, contractors and subcontractors, vendors and suppliers, users of the goods and services, and society are all included in the customer's larger perspective (Taylor and Wright, 2003).

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Training Strategy

TQM relies heavily on education and training. Because education and training are two of the most critical aspects of overall quality that involve a large number of people, the success of the implementation is directly related to how well they are carried out. According to many research findings, education and training are among the most significant factors in the successful implementation of comprehensive quality management. The study backs up what most companies already know: education and training are an integral and necessary part of the TQM initiative (Zhang, 2001). Antony et al. (2002) identified the following education and training critical aspects that would contribute to successful overall quality management adoption.

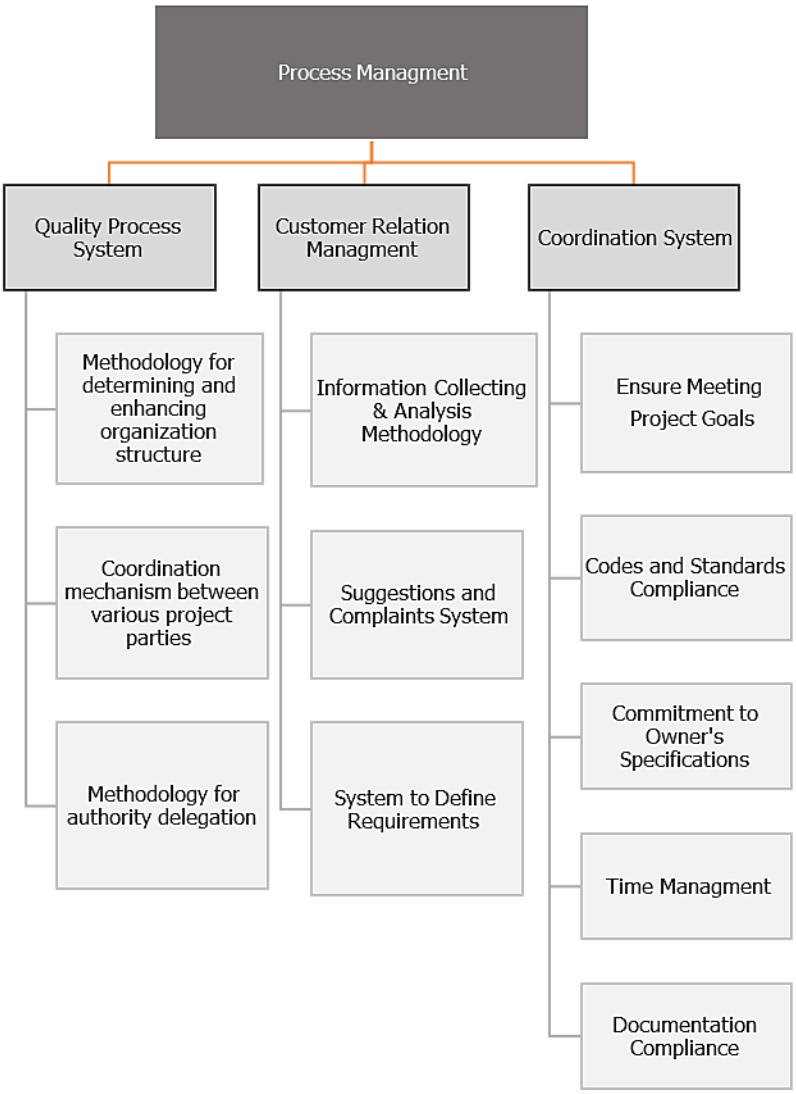

Figure 3. Process management Elements

TQM implementation challenges

Although not all techniques for adopting quality management are effective, several firms are attempting to implement quality successfully (Leslie, 1995). Those that effectively adopt TQM have an excellent possibility of gaining a competitive advantage, product and process dependability, and process efficiency (David and Richard, 2000). Quality is utilized in profit firms to reduce process costs and increase profits, whereas the quality rate is used in non-profit organizations to improve process efficiency (David and Richard, 2000). As a result, successful TQM implementation aids in achieving more without incurring losses. To guarantee that TQM is implemented successfully, organizations

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must create specific components. Several essential factors should be considered part of a successful TQM implementation strategy. The following are the factors that will be discussed as follows:

- The first challenge is applying a customer-centric strategy: businesses must use customer surveys to find out what their customers are complaining about and their needs and expectations (Juan, 2005).
- Top management support and commitment: top management should be supportive of and committed to organizational improvement efforts (Dale et al., 2007).
- Quality strategic planning: the quality team and management should plan with the organization's mission, business plan, communication strategy, and quality policies/goals in mind and constantly monitor and improve the techniques (Dale et al., 2007).
- Facts-based Management: Management should learn from quality audits and guarantee that staff is evaluated on a regular basis (Dale et al., 2007).
- Continuous improvement: Quality control tools must be created to achieve an ongoing improvement strategy (Ernest and Fred, 2012).
- Employee training: Staff should have adequate training and information regarding quality (Ernest and Fred, 2012).
- Teamwork: In order to get good results, management should encourage teamwork habits (Ernest and Fred, 2012) and (Dale et al., 2007).
- Learning: personnel should be supplied with ongoing training and education.
- Transparent communication system: quality should be communicated through the organization (Adam and Steve, 2003).
- Process management: Quality methods should be always monitored (Adam and Steve, 2003).

Considering TQM implementation vary from one organization to the next, organizational management should evaluate the following essential criteria to ensure that TQM is implemented successfully on their own. TQM implementation benefits from vital strategy planning since it specifies quality criteria.

Previous studies

Farida et al. (2021) adds to the body of knowledge on change management by presenting empirical evidence pointing to gains in knowledge and understanding of the relationship between organizational and individual readiness to apply TQM and the impact of both on quality performance. The main goal of this study was to see how ready companies and individuals were to apply TQM and how it affected quality performance in the manufacturing industry. The participants in this study were 48 employees from around 20 privately held businesses. Interviews and questionnaires have used to collect data, which was then analyzed statistically using Structural Equation Modelling and the partial least squares approach. Based on the findings of this study, individual and organizational readiness to apply TQM and quality performance have been determined to be at a reasonable level across the sector. As a result, individuals and organizational readiness in using TQM influenced 43 percent of the variation in quality performance, while other factors influenced the rest (57 %). Furthermore, with significance levels of 84 percent and more than (99%), the level of individual and organizational readiness in applying TQM had a substantial effect on quality performance.

Interestingly, Urban and Toga (2017) examined whether quality management concepts may influence product and process innovation. Leadership, customer focus, and people management were the study's main independent factors. According to the findings, customer attention and supervision positively

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affect product innovation but not the process of invention. Furthermore, according to empirical evidence, people management substantially affects both product and process innovation.

Another Study by Milan et al. (2021) to highlight disparities in the deployment of quality management systems and the maturity level of enterprises in the dairy industry. The contribution of this research shows in the diagnosis of the maturity level in the companies studied and the possibility of enhancing some areas of the quality management system to acquire the skills needed to improve the quality performance of the organizations. The primary assumption has been made based on a declared goal, which states that the use of quality management systems and the readiness of these businesses vary depending on their size. Interestingly, The Quality Management Maturity Grid model of maturity (QMMG) was the research base model. The Kruskal-Wallis test is has used as a nonparametric alternative to one-way analysis of variance of distinct groups for the initial assumption test. Methods analysis, synthesis, and descriptive statistics have also been utilized in addition to this method. Six aspects of the quality management system (management understanding and attitude, quality organization status, problem handling, cost of quality as a percent of sales, quality improvement actions, and summary of company quality posture) as well as the entire quality management system in selected companies were processed using the statistical methods mentioned. Five of the six elements and the overall quality management system had statistically significant variances.

Zhang, Feng, and Xiang (2016) published a study entitled "*The Impact of Quality Management Practices on Innovation in China: The Moderating Effects of Market Turbulence.*" The investigation consisted of 383 questionnaires from nine Chinese provinces and cities to determine the influence of QM procedures on innovation performance. The study looked at how to market instability affected the relationship between quality management techniques and innovation performance. The findings revealed that quality management methods (top management commitment, staff involvement, customer focus, continuous improvement, process flow management, and supplier partnerships) boost innovation performance.

Nguyen et al. (2021) investigate how individual quality management (QM) parameters affect business success in manufacturing companies. Research goals are achieved by evaluating TQM impact and examining how industry 4.0 directly affects business performance. Furthermore, the research will show that industry 4.0 has a minor effect on the connection between quality management and business performance. The authors used two methodology approaches in their research. The first is qualitative approaches, which involve interviewing experts to construct a realistic model. The second way was quantitative, which involved conducting a survey and collecting 84 observations. The multivariate data analysis approach PLS-SEM was used to evaluate three measurement models in this study: formative measurement, reflective measurement, and structural measurement. In summary, the findings were that The QM was described as a multi-dimensional concept. According to the results, these individual QM elements, such as customer satisfaction, employee satisfaction, and quality performance, substantially affect the organization's performance. Furthermore, Quality Management and Industry 4.0 have a direct impact on performance. Research Limitation/Impact: The survey was conducted only in emerging countries, with small sample size. Other aspects of quality management and company performance measurement have yet to be covered. Originality/Paper Value: The study adds to the QM literature by developing a business quality model that includes the role of Industry 4.0.

Furthermore, Abbas Al-Refaie, Ola Ghnaimat, and Jong-Hwan KO (2011). For 130 ISO 9001 certified firms in Jordan, this study looked at the structural relationships between nine quality management practices (leadership, quality planning, process management, customer focus, HRM, supplier management, product or service design, continuous improvement, and quality tools and techniques) and the impact of these practices on customer satisfaction (CS) and innovation. According to the findings, leadership and human resource management positively affect innovation.

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Lee, Ooi, Boon I Tan, and Chong (2010) see if there was a link between TQM methods and product innovation performance in Malaysian electrical and electronics (E&E) companies. This research was based on data gathered from a survey of 125 executives from E&E organizations. Structural equation modeling analysis is used to test the study topics. According to the findings, product innovation success has been positively connected with leadership, strategic planning, customer focus, information and analysis, human resource management, and process management. Information and analysis were seen as a critical TQM practice for increasing a company's product innovation performance.

III. RESEARCH METHODOLOGY

Research Style

The descriptive-analytical approach is followed in this study, which attempts to describe and evaluate the extent to which Total quality management is applied in ESNAD Company operations from the point of view of its employees in ESNAD. The descriptive-analytical method attempts to compare, explain, and evaluate in the hope of arriving at self-generalizations Meanings that increase the body of knowledge on the subject. However, the study used two primary sources of information as follows:

Secondary Data Sources

The research relied on secondary data sources to address the theoretical framework of applying total quality management in organizations. This procedure is accomplished by reviewing relevant books, references, previous studies, articles, reports, and scientific scholars' databases such as Saudi Digital Library (SDL), which considers one of the largest academic gatherings of information sources with more than (300,000) scientific references.

Primary Date Sources

The primary data in this study is collected through a questionnaire. Thus, to measure the practice level of Total Quality Management and its Impact on Employees Performance at ESNAD factory. An online questionnaire was designed to assist in measuring the research variables. Interestingly, various scholars agree that having well-structured questionnaires is an efficient technique to gather data that enables researchers to get accurate and relevant results. Moreover, this approach to unique and large populations will save both time and cost.

Research Population

The study population consists of all respondents to an online questionnaire designed using google docs. The location of participants was from ESNAD company which is located in Saudi Arabia exclusively. The online questionnaire was published over the internet for a reasonable duration between 20 to 30 days for convenience to respond and reduce sampling error. The time frame of participants' responses was from 10/Dec./2021 to 10/Jan./2022. The total count of obtained reactions was 37 responses, while valid responses included in the study were 25 responses as employees from ESNAD.

Sampling Size

while considering the approved statistical standards, it is found that the appropriate sample after applying the statistical volume equation is the following models:

$$x = Z(^{c}/_{100})^{2} r(100\text{-}r)$$

$$n = {}^{Nx}/_{((N\text{-}1)E^{2} + x)}$$

$$E = \text{Sqrt}[{}^{(N - n)x}/_{n(N\text{-}1)}]$$

Where N is the population size, r is the fraction of responses required to participate in the study, and Z(c/100) is the critical value for the confidence level c. The margin of error is the amount of error that

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this study can tolerate. In this investigation, the 5% margin of error is familiar, and popular choices accordingly, this approach is adopted during this study.

Substantially, the confidence level is the amount of uncertainty that can be tolerated during studies. Interestingly, the typical choices are 90%, 95%, or 99%. But a Higher confidence level requires a larger sample size which will not be applicable for this study as the sample size from ESNAD are 45. However, the amount of uncertainty applied to this study is 75% and the response distribution will be at 50%.

Eventually, after applying the equations mentioned earlier, the survey's minimum recommended sample size is 34. Interestingly, having more people responding is more likely to help get a correct answer in favor of this study.

Selecting Source of Information

The study used an assessment checklist list to avoid prejudice when selecting information sources. This technique assisted in the evaluation of articles chosen by using an appropriate policy to validate their inclusion. The point system is as follows: strongly linked (+1), linked (0), and irrelevant (-1). Basically, the first step to investigation is by identifying primary articles and then excluding papers according to titles. The third step is to exclude the articles according to the abstract and exclude papers according to the full-text content. Eventually, the last two phases were classifying papers related to study objectives then evaluating and analyzing the data of this article. Figure 4 illustrates the previously mentioned steps.

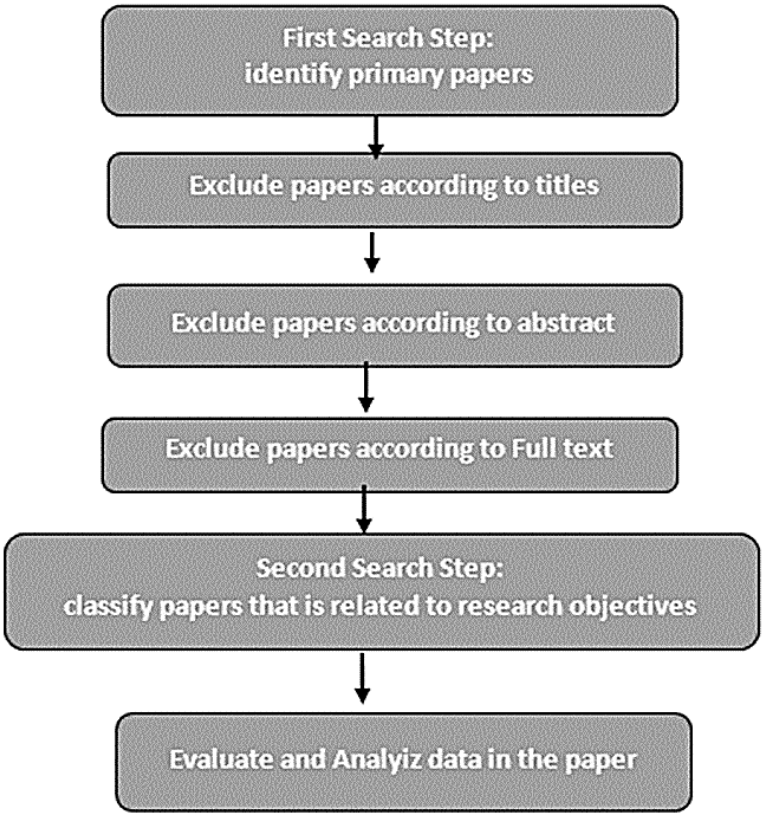

Figure 4. Steps to select the source of information.

Research Model

A questionnaire has been prepared regarding measuring the practice level of Total Quality Management and its Impact on Employees Performance at ESNAD factory from the employees' point

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of view. Accordingly, the questionnaire was divided into two parts. The first part focuses on examining the demographic characteristics of the respondents, which will later form the demographic features of the sample. the demographic question included the following (Age, gender, education level, job-level, experience, Total Quality knowledge, and organization experience with Total Quality management).

The second part of the questionnaire included the four factors of the studies as follows:

1) First Factor: Total quality management principles.
2) second Factor: Benefits of applying total quality management.
3) third Factor: Obstacles to implementing total quality management
4) fourth Factor: The essential requirements for the application of total quality management.

Furthermore, The Likert scale is utilized to measure the questionnaire. Answers were coded as follows: (Strongly Disagree) was coded as 1, (Disagree) was coded as 2, (Neutral) was coded as 3, (Agree) was coded as 4, and (Strongly Agree) was coded as 5. This coding methodology was a helpful technique to reduce analysis time when uploading all responses into the SPSS software. Table 3 illustrates the scale.

Table 3. Scale

Response	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Scale	1	2	3	4	5

Data Analysis Technique

The questionnaire is unloaded and analyzed by the statistical analysis program by using Package Statistical Sciences Social the (SPSS). The nonparametric statistic was applied to this study. Furthermore, there are several reasons why this method is followed, such as the nature of this study as the data are descriptive. This statistic methodology has gained appreciation due to its ease of use. As the need for parameters is relieved, the data becomes more applicable to an enormous variety of tests. The following nonparametric statistical tests were used in this analysis:

1. Spearman's rank correlation coefficient is a nonparametric measure of rank correlation (statistical dependence between the rankings of two variables). It assesses how well is the relationship between two variables can be described using a monotonic procedure.
2. Cronbach's alpha, to test score reliability coefficient to determine the stability of the questionnaire entities.
3. Descriptive analysis using frequencies, percentages, means and standard deviations.

IV. RESEARCH ANALYSIS

Descriptive Analysis

The main objective of this section is to introduce a brief description of the characteristics of the ESNAD participating in the survey in Saudi Arabia. This section of the questionnaire survey includes the following criteria:

1. Age Groups

The frequency distribution of age is displayed in table 4 of the age group under 30 years old formed with 30% of all participants, and the same percentage went to the age group (36 - 40). following that is the age group between (30 - 35) with 23.3%. The age group (41 - 45) formed 13.3% and finally with small size the age group of (above than 45) which included 3.3%.

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Table 4. Details of Age Groups

Age		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 30	9	30.0	30.0	30.0
	30 – 35	7	23.3	23.3	53.3
	36 – 40	9	30.0	30.0	83.3
	41 – 45	4	13.3	13.3	96.7
	> 45	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

2. Gender

Table 5 shows the frequency distribution of gender. 76.7% (twenty-three) of the respondents were male, while 23.3% (seven) were female. There is a gender gap in the sample who participated in this study.

Table 5. Details of Gender

Gender		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	23	76.7	76.7	76.7
	Female	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

3. Education Level

This section focuses on the educational level of respondents. Table 6 shows the frequency distribution of academic status. Most respondents had a bachelor's degree (76.7%). The second group (13.3) had a postgraduate degree, while 6.7% were below bachelors. Only one responded qualified with a diploma.

Table 6. Details of Education Level

Education Level		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below Bachelor	2	6.7	6.7	6.7
	Diploma	1	3.3	3.3	10.0
	Bachelor	23	76.7	76.7	86.7
	Postgraduate	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

4. Job Background

Table 7 shows the frequency distribution of Job Background within ESNAD. 40% (12) of the respondents are working in a technician position, and another 40% (12) are working in supervisory positions. At the same time, 20% (six) are working in administrative functions.

Table 7. Details of Education Background

Job Title		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Administrative Job	6	20.0	20.0	20.0
	Technician	12	40.0	40.0	60.0
	Supervisor	12	40.0	40.0	100.0
	Total	30	100.0	100.0	

5. Years of Experience

Table 8 shows the frequency distribution of Years of Experience for ESNAD employees. The result indicates that 33% (10) of the respondents have less than three years of experience. Then, 30% (9) have between 7 to 10 years of experience. Furthermore, 16.7% have between 11 to 14 years of working experience. Following, 13.3% with 3 to 6 years of working experience. Finally, two responded with experience of more than 14 years with a percentage of 6.7%.

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Table 8. Details on Years of Experience

Years of Experience		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 3 years	10	33.3	33.3	33.3
	3 – 6	4	13.3	13.3	46.7
	7 – 10	9	30.0	30.0	76.7
	11 – 14	5	16.7	16.7	93.3
	> 14	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

6. TQM Courses

Table 9 shows the frequency distribution of participants who received Total Quality Training Courses. The result reveals that 30% (9) of the respondents had one course in Total quality management. Then, 23.3% (7) have had two training courses total quality management. Also, 23.3% have had three courses or more. Interestingly, the same percentage of 23.3% have responded that they never received courses in total quality management before. However, the majority of participants, almost 80%, are familiar with total quality management.

Table 9. Details on TQM Courses

Participated in Total Quality Training Courses		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I did not participate	7	23.3	23.3	23.3
	1 Course	9	30.0	30.0	53.3
	2 Courses	7	23.3	23.3	76.7
	3 Courses and more	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

7. Applying TQM

Table 10 shows the frequency distribution of organization apply total quality management. 76.7% (twenty-three) of the respondents answered (yes) that the organization apply total quality management, while 23.3% (seven) selected (No) that the organization is not applying the total quality management. Even though the majority answered with (yes), it is still essential to conduct an investigation on those who responded (No)—the objectives of this study to understand the reason behind the selection.

Table 10. Details on Applying TQM

Does your organization apply total quality management?		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	23	76.7	76.7	76.7
	No	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

Statistical analysis, frequency, Mean, Standard Deviation and Result

Part two of the questionnaire will be analyzed in detail in this section. This part of the questionnaire consists of four areas as follows:

1. Total quality management Principles.
2. Benefits of applying total quality management.
3. Obstacles to implementing total quality management.
4. The essential requirements for using total quality management.

Firstly, each area is statistically analyzed by showing the participant's frequency and percentage of each question. Then, the Mean, standard deviation, variance, and the final result are illustrated and discussed. Eventually, the result of each area is displayed.

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Principle results

Table 11 shows the frequency distribution of the first factor, the TQM principles, consisting of five questions. In the first question, the majority (56.7%) agreed that participation in decision-making helps the positive interaction of employees with senior management through applying total quality management. Again, in the second question, the plurality with (46.7%) agreed that comprehensive quality management would motivate employees to improve performance towards their duties and responsibilities. Furthermore, participants strongly agreed that Customer feedback is essential to improve the quality of services (56.7%). Finally, in the fifth question, most participants agreed that the application of total quality management depends on continuous development efforts to improve performance.

Table 11. Frequency distribution of TQM Principles

Questions	Measure	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
P2-1-1) Participation in decision-making helps the positive interaction of employees with senior management through applying total quality management	Frequency	0	1	3	17	9
	Percent	0	3.3	10	56.7	30
P2-1-2) Applying total quality management will contributes in motivating employees to improve performance towards their duties and responsibilities	Frequency	0	1	4	14	11
	Percent	0	3.3	13.3	46.7	36.7
P2-1-3) Applying the principles of total quality management will provide consistency and harmony between employees and members of a single work team	Frequency	0	1	4	13	12
	Percent	0	3.3	13.3	43.3	40
P2-1-4) Customer's feedback is important to improve the quality of services provided	Frequency	0	0	5	8	17
	Percent	0	0	16.7	26.7	56.7
P2-1-5) The application of total quality management depends on continuous development efforts to improve performance	Frequency	0	2	2	16	10
	Percent	0	6.7	6.7	53.3	33.3

Table 12 illustrates the following statistics of the first section in part two (Mean, Standard deviation, variance, and result). Accordingly, the following statistical facts became clear. For the first question, prasipancts answers were leaning toward (Agree). Same result for question two, which leaned toward (agree). Furthermore, for questions four and five, the result of participant answers leaned toward (strongly agree). The last questions leaned toward (Agree)**.** As a result, TQM principles section leaned toward (strongly agree).

Benefits of applying total quality management result

Table 13 displays the frequency distribution of the second element, the benefits of applying total quality management, consisting of five questions. In the first question, most participants (60%) agreed that total quality management would lead to Innovating that meets customer and organization needs. Furthermore, in the second question, the plurality with (46.7%) strongly agreed that the ideal use of modern technologies to develop a work environment. Moreover, participants agreed that applying total quality management would optimize human resources, those formed (46.7%). finally, (40%) agreed that Total quality management would effective follow-up to discover deficiencies in the use of available material resources, and (36.7%) also decided to agree that it would save the time used to correct the low-quality services provided to customers.

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Table 12. Mean, Standard deviation and variance of TQM Principles

Question	N	Mean	Std. Deviation	Variance	RESULT
P2-1-1) Participation in decision-making helps the positive interaction of employees with senior management through applying total quality management	30	4.13	.730	.533	**Agree**
P2-1-2) Applying total quality management will contributes in motivating employees to improve performance towards their duties and responsibilities	30	4.17	.792	.626	**Agree**
P2-1-3) Applying the principles of total quality management will provide consistency and harmony between employees and members of a single work team	30	4.20	.805	.648	**Strongly Agree**
P2-1-4) Customer's feedback is important to improve the quality of services provided	30	4.40	.770	.593	**Strongly Agree**
P2-1-5) The application of total quality management depends on continuous development efforts to improve performance	30	4.13	.819	.671	**Agree**
P2-1) Total quality management Principles	**30**	**4.21**	**.529**	**.280**	**Strongly Agree**

Benefits of applying total quality management result

Table 13 displays the frequency distribution of the second element, the benefits of applying total quality management, consisting of five questions. In the first question, most participants (60%) agreed that total quality management would lead to Innovating that meets customer and organization needs. Furthermore, in the second question, the plurality with (46.7%) strongly agreed that the ideal use of modern technologies to develop a work environment. Moreover, participants agreed that applying total quality management would optimize human resources, those formed (46.7%). finally, (40%) agreed that Total quality management would effective follow-up to discover deficiencies in the use of available material resources, and (36.7%) also decided to agree that it would save the time used to correct the low-quality services provided to customers.

Table 13. Frequency distribution of Benefits of applying TQM

Questions	**Measure**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
		1	2	3	4	5
P2-2-1) Total quality management will lead to Innovating that meet customer and organization needs.	Frequency	0	3	0	18	9
	Percent	0	10	0	60	30
P2-2-2) The ideal use of modern technologies to develop work environment	Frequency	0	0	5	11	14
	Percent	0	0	16.7	36.7	46.7
P2-2-3) Optimizing the available human resources in a better way.	Frequency	0	0	8	14	8
	Percent	0	0	26.7	46.7	26.7
P2-2-4) Effective follow-up to discover deficiencies in the use of available material resources	Frequency	0	1	6	12	11
	Percent	0	3.3	20	40	36.7
P2-1-5) Saving the time used to correct the low-quality services provided to customers	Frequency	0	4	6	11	9
	Percent	0	13.3	20	36.7	30

Table 14 illustrates the following statistics of the second section in part two (Mean, Standard deviation, variance, and result). Accordingly, the following statistical facts became clear. Regarding the first question, participants' answers leaned toward (Agree). The result for question two leaned toward (Strongly Agree). Interestingly, questions three, four, and five leaned toward (Agree). The last questions leaned toward (Agree). Consequently, the section of benefits of applying the total quality management leaned toward (Agree).

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Table 14. Mean, Standard deviation and variance of Benefits of applying TQM

Questions	N	Mean	Std. Deviation	Variance	Result
P2-2-1) Total quality management will led to Innovating that meet customer and organization needs	30	4.10	.845	.714	**Agree**
P2-2-2) The ideal use of modern technologies to develop work environment	30	4.30	.750	.562	**Strongly Agree**
P2-2-3) Optimizing the available human resources in a better way	30	4.00	.743	.552	**Agree**
P2-2-4) Effective follow-up to discover deficiencies in the use of available material resources	30	4.10	.845	.714	**Agree**
P2-2-5) Saving the time used to correct the low quality services provided to customers	30	3.83	1.020	1.040	**Agree**
P2-2) Benefits of applying total quality management	**30**	**4.07**	**.673**	**.453**	**Agree**

Obstacles to implementing total quality management

Table 15 displays the frequency distribution of the obstacles to executing total quality management. In the first inquiry, participants asked if limited training programs in quality management would form an obstacle to adopting total quality management; interestingly, the majority of answers were distributed between two selections (Disagree and Agree); both results were weighted (33.3%). Then, in question two of part three majority of selection (33.3%) did not agree or disagree if poor motivation from the leaders and employees of the company's departments would form an obstacle for quality management programs. Likewise, (36.7%) did not agree or disagree when participants asked whether the lack of specialists in total quality management in the organization would impede applying quality management principles. Finally, when participants asked if the lack of a clear plan for the implementation of total quality management in the organization's departments would impede applying quality management principles, the majority selected agree (43.3%).

Table 15. Frequency distribution of Obstacles to implementing TQM

Questions	**Measure**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
		1	2	3	4	5
P2-3-1) Limited training programs in the field of total quality management	Frequency	0	10	8	10	2
	Percent	0	33.3	26.7	33.3	6.7
P2-3-2) Poor motivation from the leaders and employees of the company's departments	Frequency	2	9	10	7	2
	Percent	6.7	30	33.3	23.3	6.7
P2-3-3) Lack of senior management support in the organization to implement total quality management in its various departments	Frequency	7	1	11	8	3
	Percent	23.3	3.3	36.7	26.7	10
P2-3-4) Lack of specialists in total quality management in the organization.	Frequency	1	6	11	10	2
	Percent	3.3	20	36.7	33.3	6.7
P2-3-5) The lack of a clear plan for the implementation of total quality management in the departments of the organization	Frequency	1	4	8	13	4
	Percent	3.3	13.3	26.7	43.3	13.3

Table 16 illustrates the following statistics of the third section in part two (Mean, Standard deviation, variance, and result). Accordingly, the following statistical facts became clear. Regarding the first question, participants' answers leaned toward (Neutral). Likewise, the result for the second question leaned toward (Neutral). Furthermore, questions three and four leaned toward (Neutral). Interestingly, the last question in this section leaned toward (Agree). Accordingly, the area of obstacles to implementing total quality management leaned toward (Neutral).

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Table 16. Mean, Standard deviation and variance of Obstacles to implementing TQM

Questions	N	Mean	Std. Deviation	Variance	Result
P2-3-1) Limited training programs in the field of total quality management	30	3.13	.973	.947	**Neutral**
P2-3-2) Poor motivation from the leaders and Leader employees of the company's departments	30	2.93	1.048	1.099	**Neutral**
P2-3-3) Lack of senior management support in the organization to implement total quality management in its various departments	30	2.97	1.299	1.689	**Neutral**
P2-3-4) Lack of specialists in total quality management in the organization	30	3.20	.961	.924	**Neutral**
P2-3-5) The lack of a clear plan for the implementation of total quality management in the departments of the organization	30	3.50	1.009	1.017	**Agree**
P2-3) Obstacles to implementing total quality management	**30**	**3.15**	**.587**	**.345**	**Neutral**

Important Requirements

Table 17 below illustrates the examination of the essential requirements for applying total quality management. In the first question, participants asked about the existence of objective standards to measure productivity; interestingly, the majority of answers (56.7%) selected agreed. Then, in question two of part three majority of the selection (30%) decided to agree on having a clear organizational structure. Likewise, (53.3%) agreed on the availability of specialists in total quality management. Then, in the fourth question (50%) did not agree or disagree when they asked about sufficient encouragement from senior management to implement TQM. Finally, both questions (fifth and sith) Participants agreed with the same percentage (43.3%).

Table 17. frequency distribution of the most important requirements for application of TQM

Questions	**Measure**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
		1	2	3	4	5
P2-4-1) Existence of accurate standards to measure productivity	Frequency	3	5	1	17	4
	Percent	10	16.7	3.3	56.7	13.3
P2-4-2) Having a clear organizational structure	Frequency	0	8	6	9	7
	Percent	0	26.7	20	30	23.3
P2-4-3) The availability of specialists in total quality management	Frequency	0	3	9	16	2
	Percent	0	10	30	53.3	6.7
P2-4-4) Sufficient encouragement from senior management to implement TQM	Frequency	0	3	15	7	5
	Percent	0	10	50	23.3	16.7
P2-4-5) The availability of work teams to solve problems	Frequency	0	4	3	13	10
	Percent	0	13.3	10	43.3	33.3
P2-4-6) Providing specialized training courses in the field of total quality	Frequency	0	2	7	13	8
	Percent	0	6.7	23.3	43.3	26.7

Table 18 illustrates the following statistics of the last section in part two (Mean, Standard deviation, variance, and result). Accordingly, the following statistical facts became clear. In the first question, participants' statistical answers leaned toward (Agree). Likewise, The result for the second question leaned toward (Agree). Furthermore, questions three, four, five, and six also leaned toward (Agree). According to the previous facts, the examination of the essential requirements for applying total quality management leaned toward (Agree).

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Table 18. Mean, Standard deviation and variance of the most important requirements for the application of TQM

Questions	N	Mean	Std. Deviation	Variance	Result
P2-4-1) Existence of accurate standards to measure productivity	30	3.46	1.224	1.499	Agree
P2-4-2) Having a clear organizational structure	30	3.50	1.137	1.293	Agree
P2-4-3) The availability of specialists in total quality management	30	3.56	.774	.599	Agree
P2-4-4) Sufficient encouragement from senior management to implement TQM	30	3.46	.899	.809	Agree
P2-4-5) The availability of work teams to solve problems	30	3.96	.999	.999	Agree
P2-4-6) Providing specialized training courses in the field of total quality	30	3.90	.884	.783	Agree
P2-4) The most important requirements for the application of total quality management	30	3.64	.832	.693	Agree

Scale Reliability Analysis

The stability of the questionnaire is intended to give this questionnaire the same result if the questionnaire was redistributed several times during specific periods of time. The reliability of the study's questionnaire was verified through the Alpha Cronbach coefficient method, as follows.

The alpha coefficient for the first items is (.701), suggesting that this item has relatively high internal consistency; accordingly, it is considered acceptable. For the second item, the alpha coefficient is (.855), implying that it has relatively high internal consistency; thus, it is also considered acceptable. The alpha coefficient for the third item is (.427), and the reliability coefficient below (.70) is unacceptable. The fourth item of the alpha coefficient is (.912), which is considered acceptable. However, the alpha coefficient for the four research items is (.724), which suggests that the items have relatively high internal consistency accordingly, which is considered acceptable and table 19 illustrate the Cronbach's Alpha of this study.

Table 19. Cronbach's Alpha Values

Item	Cronbach's Alpha
Total quality management Principles	0.701
Benefits of applying total quality management	0.855
Obstacles to implementing total quality management	0.427
The most important requirements for the application of total quality management	0.912
Result of the models	0.724

V. RECOMMENDATIONS AND LIMITATIONS

The purpose of this study is to determine the extent to which TQM techniques have been implemented and to illustrate their impact on product innovation and development in ESNAD industrial firms. The study's findings revealed that the targeted organization are adopting TQM methods in a good trend, and employees are ready to accept TQM. This suggests that these businesses prioritize quality in their operations and activities.

While this research achieved its main objectives by examining the primary research questions and hypotheses, it has significant limitations that limit its reducibility. These constraints may extend up new research routes in future work. However, various conditions were realized as follows:

- This research is a requirement for passing a master's program that is limited to university timeline; therefore, the time and budget were the main constraints.
- According to research methodology, the sample sizes equation was appropriate, but more comprehensive samples might deliver more conviction and significant outcomes.

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- It was challenging to include all the findings from this study's varied research methodologies. As a result, the researcher focuses on the most critical and relevant facts that can help answer the research questions and appropriately test the study hypotheses.
- It wasn't leisurely to include all of the findings from the many research approaches used in this study. As a result, the researcher concentrates on the most critical and relevant information to answer the research questions and test the study hypotheses effectively.
- When conducting future research in the same area, it is necessary to account for these aspects, such as the business environment's uncertainty, firm size, and financial resources.

The following are the study's primary recommendations:

Top management of industrial companies in Saudi Arabia should recognize that quality and innovation are critical aspects of survival, expansion, and creating a lasting competitive advantage. TQM procedures should be used in order to improve products and services.

To raise the level of innovation in their companies, managers in industrial companies must promote better adoption of Soft TQM techniques by involvement, supervision, or financial support.

Senior management in industrial firms should encourage employees to work together as a team. This promotes the sharing of information and experience and the invention of new ideas that improve the company's level of innovation and performance.

Industrial companies should focus more on customer needs and requirements by conducting market research on customer needs and expectations in order to use the results in designing new products, thus improving product quality and manufacturing processes to retain current customers and gain new customers.

VI. CONCLUSION

The conclusions of this study indicated the importance of TQM implementation. TQM is a never-ending cycle of incremental improvements. It gives the company a competitive advantage. Those companies that neglect TQM are doing themselves a disadvantage. However, TQM appears to be challenging to summarize in brief definitions.

The independent variables' effects on TQM innovation were found to be disparate. The study discovered that leadership has a more significant impact on product innovation, indicating that the surveyed companies have a plan, a clear vision, and specific objectives to achieve through the adoption of TQM practices. This is also demonstrated by the empowerment of its employees, which is demonstrated by giving them powers to make decisions about their work, resulting in the creation of a suitable environment for the emergence of innovation.

TQM benefits from continuous improvement as well. This suggests that the organizations assessed are constantly working to enhance their manufacturing methods, workers, technology, and product quality to increase their overall performance and Quality.

We can figure out a high level of agreement amongst the various sorts of organizations. However, the following goals were met in this study:

- The degree of consistency is examined in terms of quality judgments amongst different types of organizations; accordingly, it was discovered that there is a large amount of agreement among them.
- The comparable weights of the impacting factors were emanated from providing the guidelines to implementing TQM.

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The study's findings clearly show that several essential sub-variables were required for successful TQM adoption in ESNAD organization, including the following:

- Allowing participation in decision-making helps the positive interaction of employees with senior management through applying total quality management
- To apply TQM, the commitment of both top management and personnel is sessional.
- Continuous progress must be pursued while keeping a long-term vision in mind. Therefore, a successful TQM program will require improvements for both the procedures and the organizational system.
- Applying TQM will contribute in motivating employees to improve performance towards their duties and responsibilities.
- Applying TQM will contribute in motivating employees to improve performance towards their duties and responsibilities.
- Leadership positions must receive education in TQM concepts and procedures. Without this, it's impossible to see managers providing the vision and leadership required to change the organization's culture.
- Providing specialized training courses in the field of TQM
- Strengthen human relationships in the same manner; they improve external customer relationships through enhancing communication of applying TQM.

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