

Effects of ISO 9001 as a Mediator between TQM, Organizational Performance, and the Baldrige Excellence Framework in the Libyan firms

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المخلص

تطبق معظم المنظمات التنافسية إدارة الجودة الشاملة (TQM) ، والتي تُعرف على نطاق واسع بأنها استراتيجية رئيسية تُستخدم من قِبَل المنظمات التنافسية لتحسين أدائها بشكل مستمر. ومع ذلك، تشير الدراسات إلى أن اعتماد TQM وأنظمة إدارة الجودة (QMS) كان بطيئاً في ليبيا ، إذ يظل عدد الشركات المعتمدة بموجب معيار ISO 9001 في ليبيا مقارنةً بالدول العربية الأخرى صغيراً نسبياً، مما يشير إلى نقص الحماس والوعي بشأن أهمية TQM في تلبية احتياجات المجتمع الليبي. لمعالجة هذه الفجوة ، تهدف هذه الدراسة إلى تطوير نموذج مفاهيمي شامل لتنفيذ إدارة الجودة الشاملة TQM في القطاع الصناعي في ليبيا ، مع التركيز على العلاقة بين إدارة الجودة الشاملة TQM وشهادة ISO 9001 والأداء التنظيمي.

للتحقيق في النموذج المقترح ، يتم استخدام تحليل المسار باستخدام نمذجة المعادلات الهيكلية (SEM) لإنشاء تطبيقات إدارة الجودة الشاملة (TQM) والتحقق من صحتها والتأثير على الثقافة التنظيمية والأداء. يوفر النموذج المقترح فهماً أفضل للعلاقة بين إدارة الجودة الشاملة TQM والأداء التنظيمي في ليبيا. ينصب تركيز هذه الورقة بشكل أساسي على الحالة الفعلية لتنفيذ إدارة الجودة الشاملة (TQM) ، حيث تطبق جميع الشركات برامج رسمية لإدارة الجودة الشاملة TQM وتلك التي تطبق بشكل أساسي ممارسات إدارة الجودة الشاملة TQM . تم اختبار الفرضيات لتحديد العلاقة بين إدارة الجودة الشاملة TQM و OP لتحديد الوسيطات التي تؤثر على ISO 9001. ووجد أن ISO 9001 لها علاقة إيجابية بين إدارة الجودة الشاملة TQM و OP كوسيط للمصنعين الليبيين.

إن الأفكار المكتسبة من هذه الدراسة لها آثار على المنظمات التي تهدف إلى تحسين أدائها من خلال ممارسات إدارة الجودة الشاملة ويمكنها توجيه مبادرات السياسات التي تهدف إلى تعزيز اعتماد أوسع لشهادة إدارة الجودة الشاملة TQM وشهادة ISO 9001 في القطاع الصناعي الليبي.

الكلمات المفتاحية: إدارة الجودة الشاملة، شهادة الأيزو 9001، الأداء التنظيمي، نمذجة المعادلات الهيكلية (SEM).

Abstract

Most competitive organizations apply Total Quality Management (TQM) which is widely recognized as a key strategy employed by competitive organizations to continuously improve their performance. However, studies indicate that the adoption of TQM and Quality Management Systems (QMS) in Libya has been sluggish. The number of ISO 9001-certified companies in Libya, compared to other Arab countries, remains relatively small, suggesting a lack of enthusiasm and awareness regarding the importance of TQM in addressing the needs of Libyan society. To address this gap, this study aims to develop a comprehensive conceptual model for implementing TQM in the industrial sector of Libya, focusing on the relationship between TQM, ISO 9001 certification, and organizational performance.

To investigate the proposed model, Path analysis using Structural Equation Modelling (SEM) is used to create and validate TQM applications and influence organizational culture and performance. The proposed model provides a better understanding of the association between TQM and organizational performance in Libya. The concentration of this paper is mainly on the actual state of TQM implementation, with all companies applying formal programs of TQM and those basically implementing TQM practices. Hypotheses were tested to determine the association between TQM and OP to determine mediations affecting ISO 9001. ISO 9001 was found to have a positive relationship between TQM and OP as an intermediary for Libyan manufacturers. The insights gained from this study have implications for organizations aiming to improve their performance through TQM practices and can inform policy initiatives aimed at promoting broader adoption of TQM and ISO 9001 certification in Libya's industrial sector.

Keywords: Total Quality Management, ISO 9001 Certification, Organization Performance, Structural Equation Modelling (SEM).

1. Introduction

Today's manufacturing firms must be competitive in a variety of previously uncompetitive areas, such as products and innovation. The combination of environmental, technical, cultural, economic, and socio-political challenges requires us to respond quickly and effectively in many different areas simultaneously. Several high-quality and TQM initiatives are available for manufacturers to prepare for the current situation and future challenges [1]. Manufacturing is one of the many services in the industrial sector, characterized by excellent customer contact with individually customized service solutions where performance is the focus of research. Key determinants of service performance quality, service capabilities, customer complaints, and situational factors were investigated. Total Quality Management is the future goal of the manufacturing industry and is a technique for continuous improvement aimed at performance. TQM is an approach that has been developed in the manufacturing industry in recent years and can respond directly to the globalization and competitiveness of the manufacturing market [2].

The vast majority of successful manufacturers have adopted TQM to make their tremendous contributions. Therefore, the significance of TQM as an effective pillar for attaining manufacturing brilliance cannot be ignored. The concept of manufacturing excellence is the way to become the best manufacturer. This is the ultimate goal for best-in-class manufacturing capability or performance. Depending on the situation, the mediating effect of corporate entrepreneurship between environmental culture and performance has an indirect negative or positive impact on financial performance that the organization's response level performs and a positive or negative influence on market culture. The indirect effect of being sold through a new business self-renewal. This means that the entrepreneurial nature of companies is more likely to be an intermediary [3].

2. Background of the Study

Total Quality Management is a leadership philosophy and strategy based on continuous improvement of all processes, people empowerment, and continuous learning, with the aim of bringing about organizational change while delivering superior products and services. Many organizations around the world use TQM to improve their competitiveness and financial results [4].

TQM is strongly encouraged to have a good operational policy, but pressure motivates organizational management to evaluate business strategies and practices and to be creative and innovative to improve performance.

In this context, the top management needs to integrate the 'quality vision' into the goals and objectives of the organization. The effectiveness of the organization is consistent with the theory of structural-technical interventions that emphasize productivity, factors of performance, and relationships between workers. Structural technical intervention strategy also focuses on the level of involvement in the organization's development and change process. One of the main interventions identified is the socio-technical system that focuses on the circuits of quality control and total quality management. Factors that determine the effectiveness of the organization through continuous improvement [5].

Despite the availability of the latest version of ISO 9001:2015, Libyan firms continue to face challenges in implementing ISO 9001:2008, while the emphasis on quality management has been relatively limited, reflecting a similar trend observed in other Arabic countries [6, 7]. The scarcity of Libyan firms that have obtained ISO certification indicates a delay in accreditation. The main hurdle stems from the inadequate execution of the ISO 9001 Quality Management System (QMS) process in Libya over the past few decades. Insufficient dedicated resources and a shortage of well-trained professionals with expertise in international quality management system standards pose significant barriers to successful implementation in Libya [8, 9]. Additionally, the absence of a well-established support system and tailored guidance further exacerbates the challenges faced by Libyan companies in this domain.

This implementation gap in ISO 9001 negatively impacts the overall quality management practices in Libyan firms. It hinders their ability to meet international quality standards, impairs competitiveness in the global market, and restricts opportunities for growth and development. Addressing these issues requires a concerted effort to provide adequate resources, training, and support to enable Libyan companies to effectively implement and benefit from ISO 9001:2015 and improve their quality management practices.

3. Research Objectives

The general objective of this research is to find out the effectiveness of ISO 9001 as a mediators between Total Quality Management (TQM) and Organisational Performance (OP) among Libyan manufactories. Specifically, the objectives of the research are to:

1. Analyse the association between TQM and organizational performance by ISO 9001.
2. Determine the mediating effect of ISO 9001 between TQM and organizational performance OP.

4. Research questions

To answer the research objectives, the following questions need to be answered :

1. What is the nature of the association between TQM, ISO 9001 and organizational performance
2. Does ISO 9001 mediate the relationship between TQM and OP in the Libyan firms?

5. Total Quality Management (TQM) and Business Excellence Models (BEMs)

The Business Excellence Model (BEM) was originally called the Total Quality Management Model (TQM). Today, it is commonly stated as the Business Excellence Model (BEM). The term helps convey the meaning of 'excellence' in all aspects of a business, not just product or process quality. Traditionally, it was used to assess core values and concepts of business excellence (success factors) that are embedded and integrated into an organization. The organization uses its TQM to understand and evaluate processes that need improvement to improve results. This includes the organizational environment, key business relationships, and strategic context (competitive landscape, strategic challenges, and benefits, performance improvement systems, etc.) [10]. Business Excellence (BE) the goal is to develop and enhance an organization's control systems and processes in order to improve overall performance and create value for its stakeholders. BE does more than just provide quality systems. BE is about delivering excellence in everything an organization does, including leadership, strategy, customer centricity, information management, people and operations, and most importantly, achieving superior performance. BEM helps organizations assess

their strengths and areas for improvement and guides them on what to do next. BEM provides senior executives with a comprehensive way to run their businesses and support key decisions that lead to sustainable and measurable success. In a way, BEM acts as an organization's internal management consultant. Ensure business decisions address the needs of all stakeholders in line with organizational goals and take into account current considerations of international best practices. TQM and BEM have been the most popular in the last 20 years. Existing BEM models are often developed or supported by national agencies as a basis for the winning programmer and for the widespread adoption of his TQM principles and methods and BE [11]. According to [12], the Baldrige Excellence Framework, which stands for Baldrige Performance Excellence, enables organizations in order to achieve their goals, advance their outcomes, and become competitive. Thousands of organizations use the Baldrige Excellence Framework worldwide as their main values and concepts, standards of excellence, and evaluation guidelines to achieve and improve sustainable results. Persons acknowledged as a National Model obtain an MBNQA. Presidential prize. Over 100 receivers share their best practices with others. The purpose of the Baldrige Framework is to enable an organization or industry to answer three questions. How do you identify? What and how should your organization need to improve or change? By challenging your organization with the questions that make up the Standards for Excellence in Performance, you can find out how well your organization is achieving what is important. The seven critical aspects of the Baldrige Excellence Framework on managing and performing as an organization; [13] are as follows: (i) leadership, (ii) strategy, (iii) customers, (iv) measurement, analysis, and knowledge management, (v) workforce, (vi) operations, and (vii) results. Figure (1) shows the Baldrige Excellence Framework. It is applied in the United States but has been adopted by many countries around the world.



Figure (1): Baldrige Performance Excellence Program (2018)

TQM Elements

In the literature review, various studies have provided operational definitions of the key dimensions of Total Quality Management (TQM) to facilitate a comprehensive understanding and comparison. The dimensions commonly explored include leadership, strategy design, consumer concentration, measurement analysis, and knowledge management, workforce focus, and operation focus. These dimensions serve as critical components of TQM and are assessed to measure the degree of TQM implementation within an organization. Scholars have extensively examined these dimensions in the context of TQM, ensuring their alignment with the theoretical construct of TQM and its application in practice [14],

To assess the level of TQM implementation, this study adopts six widely accepted TQM elements: customer focus, strategic planning, leadership, knowledge management and information, operations process, and workforce. These elements have been derived from a comprehensive review of the literature and have been supported by numerous authors. They serve as fundamental pillars for successful TQM implementation and are instrumental in achieving organizational excellence. This paper adopts TQM as the theoretical framework and foundation, drawing upon the principles of the Baldrige Excellence Framework [13];[15]

6. The ISO 9001 Family of International Standards

The ISO 9001 family of international standards is developed by the International Organization for Standardization (ISO), which consists of 165 national standards bodies. ISO 9001 provides a set of standardized requirements for quality management systems (QMS) and is applicable to organizations of all sizes and sectors. The most recent version is ISO 9001:2015, which replaced ISO 9001:2008. Certification under this standard allows organizations to adopt a systematic and structured approach to managing their operations, ensuring consistent product or service quality, and meeting customer expectations.

ISO 9001:2015 emphasizes a process-based approach to quality management, focusing on risk-based thinking and strong customer orientation. It provides a framework for organizations to establish and maintain a QMS that drives continual improvement, prevents nonconformities, and enhances customer satisfaction. The standard places greater emphasis on leadership, organizational context, and the involvement of top management in driving quality initiatives.

The effectiveness of ISO 9001:2015 relies on organizations' internal motivation and commitment to quality improvement, rather than solely seeking certification as a means of demonstrating compliance. By implementing ISO 9001:2015, organizations can gain a competitive edge, enhance their operational efficiency, and improve overall customer satisfaction [16]; [17]. The standard promotes a culture of quality, continual improvement, and a proactive approach to identifying and addressing risks and opportunities in the organization.

The Effectiveness of ISO 9001 as a Mediating Variable in the Link between TQM and OP

In this discussion, the authors examine the effectiveness of ISO 9001 as a mediator between TQM and organizational performance (OP) in Libyan firms. ISO 9001 effectiveness is defined as the extent to which the expected results are achieved [18]. Analyzing the competence of an ISO 9001 QMS requires considering the organization's approach to key deliverables and understanding the influencing factors beyond quality practices. [19]. The impact of ISO 9001 on performance is hindered when there is a lack of internal enthusiasm and motivation, emphasizing the significance of seeking certification as a quality improvement approach [17].

Practical evidence supports a consensus on the underlying structure of ISO 9001 effectiveness, and the indicators used to assess its objectives are derived from research [20] ISO 9001 effectiveness directly and significantly affects product service quality and organizational performance (OP) in service companies. However, only OP has a direct impact on financial performance, with the influence of ISO 9001 effectiveness being indirect through a significant correlation with OP. The impact of ISO 9001 effectiveness on service organizations' performance in terms of market share and customer satisfaction remains uncertain. Confirming the basic structure of ISO 9001 efficiency, a study involving small and medium-sized food manufacturing companies identified three objectives of ISO 9001 (prevention of non-conformance, continuous improvement, and customer focus) [20].

7. Organisational Performance (OP)

Performance is an important variable in any organizational and job performance issues. There was an argument by [21] that success in performing a task is determined by employee performance. In other words, performance is a critical factor in success. With regard to the success of the organization, the managers need to pay attention to the OP to get the best results. OP is a measure of how successful an organization is in achieving its goals [22]. Various studies have shown that there are five types of abilities. First, individual knowledge of a particular job or specialty, second, the ability to perform physical or mental skills or performance, third, individual attitudes and values that support self-concept or self-image, and fourth, physical traits or characteristics. With a situation or information and, finally, a certain motive, idea or intent that acts as the basis and encourages the individual to act or act in a certain way [23]. They are six TQM dimensions, three ISO 9001 dimensions and four OP dimensions as the relationships between the concepts are shown in Figure (2).

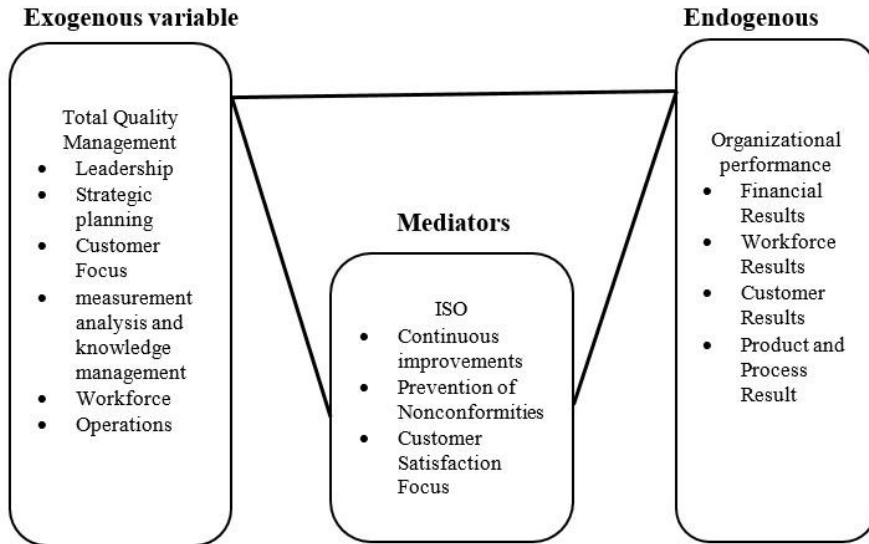


Figure (2): A Model shows the structural relationship between TQM, Effectiveness of ISO 9001 Certification, and OP

Research Hypothesis

H1: TQM implementation has a significant influence on OP.

H2: TQM implementation has a direct positive significant influence on ISO

H3: ISO effectiveness has a direct significant influence on OP.

H4: ISO 9001 certification will mediate the relationship between TQM and OP.

8. Methodology

8.1. Research Design

According to [24], research design is the specific ways involved in the research procedure: data collection, data analysis and report writing. The survey design with questionnaire was the most commonly used alternative in Production and Operation Management research. [25] Compared to other research strategies based on three conditions; the type of research questions, investigator control over behavioural events and degree of focus on contemporary issues. Both the case study and survey have no investigator control over behavioural events, and they focus on contemporary issues. The

case study answers questions related to how and why. However, the survey answers questions related to who, what, where, how many and how much. Since the current research attempted to answer such questions, survey is the preferred method. Moreover, many TQM studies have used the survey method. Based on all these considerations, a survey was used in this research to empirically investigate the proposed research model. The empirical survey was divided into two parts: a pilot survey and a final survey. The purpose of the pilot survey was to study the responses, and rectify, modify and redefine the questions for the final survey if necessary.

Research design involves planning the actual research, addressing aspects such as research paradigms, strategies, approaches, data collection methods, and data analysis techniques. All of these influence the extent to which research goals and objectives are achieved.

The theoretical framework underpinned the basis for the design of this research; the independent variable in this study is TQM in the Libya firms. The dependent variables in this study are OP. However, ISO 9001 effectiveness as a mediator. It also provided some explanations with respect to the findings of this study and compared these results to previous related studies. Additionally, it was cross-sectional in nature; in that data were collected at one point in time. [26].

Data collected through the questionnaire were analysed using the Statistical Package for Social Sciences (SPSS). SPSS is a widely used software program for statistical analysis in social sciences research. It facilitated the organization, manipulation, and interpretation of the collected data. Descriptive statistics, such as frequencies and percentages, were calculated to provide an overview of the responses. Additionally, inferential statistics, including correlation and regression analysis, were employed to examine the relationships between variables and test the proposed research model.

Structural Equation Modelling (SEM) was used to analyse the data and test the proposed relationships between TQM, ISO 9001 effectiveness, and organizational performance. SEM is a comprehensive statistical technique that enables the examination of complex relationships among variables and provides insights into the underlying theoretical model. In this research, SEM allowed for the assessment of both direct and indirect effects between the variables.

The Partial Least Square (PLS) approach was employed in this research to estimate the measurement and structural models within SEM. PLS is particularly useful when the focus is on prediction and explanation rather than testing hypotheses. It accommodates small sample sizes and is less sensitive to violations of distribution assumptions compared to other approaches. By utilizing PLS, this research aimed to assess the mediating role of ISO 9001 effectiveness between TQM and organizational performance in the Libyan firms.

Overall, the research design encompassed a survey method, the development of a questionnaire, data analysis using SPSS, the application of SEM with the PLS approach, and the utilization of a cross-sectional research design to gather data at a single point in time [26]. These elements collectively contributed to the empirical investigation of the proposed research model and facilitated the examination of the relationships between TQM, ISO 9001 effectiveness, and organizational performance in the context of Libyan firms.

9. Hypotheses Testing

The PLS method to test hypotheses from both the temporal and structural models. Accordingly, a full model, which comprises the structural model for all phases, was identified, constructed and tested along with supplementary pathways to examine the temporal models beta coefficients for the model's paths. A PLS takes measurement errors into account, but not only that; it generates estimates of standardized regression coefficients. The method of PLS can be utilized to evaluate the relationship between the latent variables [27]. The relationship between the study's variables was presented and hypothesized by the structural model. The result of the direct relationship between the study variables is shown in Table 4. The study found a positive relationship between TQM and OP. The results indicated the existence of a positive TQM on OP ($\beta = 0.180$, $p < 0.01$), a significant relationship between TQM and ISO 9001 ($\beta = 0.467$).

Table 4: Testing the Direct Effect

Relationship	Beta	Std. Error (STERR)	t-value	Decision
TQM -> OP	0.180	0.069	2.606**	Supported
TQM -> ISO	0.467	0.045	10.184**	Supported
ISO -> OP	0.253	0.067	3.7873**	Supported

p<0.01), and a significant relationship between ISO 9001 and OP ($\beta = 0.253$, p<0.01). Thus, these results supported hypotheses H1, H2, H3.

9.1. Testing the Mediating Effect

Testing the mediating effect of ISO 9001 was one of the main objectives of the paper. To test the ISO of the mediating effect and testing this effect, a t-test via non-parametric procedure of bootstrapping was undertaken. With the non-parametric PLS path-modelling approach, a non-parametric bootstrapping procedure was administered to test the significance of the mediating effect as suggested by [28]. In this study, indirect relationship was found to be supported based on the hypotheses formulated; the results of the mediating effect are also shown in the summary Table 5.

Table 5: Testing the Mediating Effect

Path	Path a	Path b	Path a*b	Std. error	t-value	95% LL	95% UL	Decision
TQM>ISO>OP	0.467	0.254	0.119	0.035	** 3.392	0.050	0.187	Supported

9.2. Assess the Variance Accounted For (VAF)

The variance described in the VAF evaluation is performed to see how much the mediator variable is up taken. The variance with VAF in consideration determines the magnitude of the indirect effect relative to the overall effect. $VAF = \text{indirect effect} / \text{total effect}$. We can conclude that the VAF is less than 20% and there is little mediation. In contrast, if the VAF results are very large (80% or more), you can assume complete mediation. Cases in which VAF is greater than 20% and less than 80% may be described as partial mediation [29]. In this study, the calculated VAF was 66%, which was partially mediated.

$$AVF = \text{Indirect Effect} / \text{Total Effect} = a*b / a*b + c = 0.119 / 0.119 + 0.180 = 0.119 / 0.299 = 0.66, 66\%$$

Table 6: Assess the Variance Accounted For (VAF)

No	Path	Path a	Path b	Path a*b	Std. error	t-value	Rate	Level
H7	TQM>ISO>OP	0.467	0.254	0.119	0.035	3.392**	66%	Partial

TQM=Total quality Management; ISO= International Standard Organisation;
 OP =Organisational Performance

9.3. R-squared

As shown in [30], R² provides a range of variations to endogenous constructs that are accounted for by exogenous constructs. The value of R² increases as the number of exogenous variables increases [31]. In this study, after evaluating the metrological model, the structural model was evaluated in the following steps. First, I checked the value of each construct R². In PLS, the R² score represents the amount of variance of the structure of interest explained by the model. The value of R² is important in research, and there are differences in what level of R² value is satisfactory. According to the guidelines in [32], R² values between 0.02 and 0.12 are weak, 0.13 and 0.25 are moderate, and 0.26 and above are significant. The R² values for ISO 9001 and OP were found to be 0.218 and 0.163 respectively.

9.4. Predictive Relevance (Q²)

A predictive sample reuse technique known as Stone-Geisser Q² can be applied as a measure of predictive significance, unlike determining the size of R². This technique represents a combination of cross-validation and functionality in the light that predicting possible observations or observations is more relevant than estimating synthetic configuration parameters. [33] He also emphasized using this measure to assess the ability of research models to make predictions. Taking this approach in PLS ensures a blind procedure that removes some data within a given indicator block during parameter estimation and tries to estimate the omitted part using the estimated parameters [34]. Based on the blindfold procedure, Q² assesses the predictive validity of the model via his PLS. Q² is generally estimated using an omission of distance of 5 - 10 in PLS [35] Q² values larger than zero indicates that the exogenous constructs have a predictive relevance for the endogenous construct [36]. The summary of the predictive relevance has been outlined in Table 7, showing R² and Predictive Relevance respectively.

Table 7: Result of Predictive Relevance (Q^2) and R-squared (R^2)

Predictor	Endogenous	Beta	Q^2 (CV Red)	R^2	Level
TQM	ISO	0467	0.108	0.218	Moderate
TQM	OP	0.180	0.087	0.163	Moderate
ISO		0.254			

TQM=Total quality Management; ISO= International Standard Organisation;
 OP =Organisational Performance

9.5. Recapitulation of the Findings

This study focuses on the implementation of total quality control in Libya's industrial sector, which plays an important role in the course of Libya's economic and social development. However, to succeed in the global market, the sector needs to learn from successful organizations around the world and improve its operations. Comprehensive quality control practices in Libya's industrial sector have proven vital to its survival and growth. The aim of the current study is to examine the effect of his TQM on the OP of a Libyan manufacturer. This study tested the effectiveness of ISO 9001 as an intermediary in the relationship between TQM and OP. The purpose of this study is to examine the relationship between TQM and OP through ISO 9001 as a facilitator of a manufacturing company in Libya. Here are some questions that will help you reach your research goals.

9.6. Does ISO 9001 mediate the relationship between TQM and OP in the Libya firms?

It turns out that ISO 9001 has a positive and significant relationship between TQM and OP among Libyan manufacturers, and as a result, ISO 9001 is considered as ISO as a tool that can be implemented within the context of TQM implementation. . 9001 is highly rated as a set of standards regulated to improve an organization's level of quality. This relationship illustrates the importance of ISO 9001 as an intermediary between TQM and OP, which can lead to improved performance and productivity. Most importantly, ISO 9001 is globally recognized because it is certified, which means that the company is moving towards globalization and implementing Total Quality Management. Its main goal, it is widely claimed, is to

harmonize standards around the world that can enhance trade and contribute to the efficiency of global welfare. In general, the impact of QMS ISO 9001 on organizational performance is the improvement of product quality for these manufacturers, so in terms of product quality and quantity, there is an impact of QMS ISO 9001 on OP improvement.

9.7. The Relationship between TQM and OP

Two tests were made in order to measure the relationship between TQM and OP, namely the direct effect between TQM and OP without mediating and the direct effect with mediating. The direct effect without mediating showed a positive significance relationship between TQM and OP, and the direct effect with mediating between TQM and OP showed a positive relationship between TQM and OP. As a result, both have indicated a positive significance relationship between the TQM and OP. This is similar to the findings from [37]. TQM is beneficial in order to improve quality, as the implications of TQM and practices work positively in improving the organisational performance [38]. Study [5] also demonstrated a focus on the four dimensions of TQM. Customer focus, continuous improvement, and employee and senior management engagement help identify the most important quality aspects of an organization's performance predictions.

9.8. The Relationship between the TQM and ISO 9001

Tests have been conducted to measure the relationship between TQM and ISO 9001, and the results have shown a positive and significant correlation. These findings confirm that a strong TQM system requires a thorough understanding of internal processes. ISO 9001 adopts a structured approach to managing business practices and offers a proven framework for consistently producing high-quality products. TQM is more than just a philosophy [39]; it encompasses a comprehensive system of principles, methodologies, and practices that aim to achieve continuous improvement and customer satisfaction. ISO 9001 certification serves as a vital marketing tool, signifying official recognition that a company adheres to and implements its own quality management system. With its global recognition, ISO 9001 certification allows companies to expand their reach and establish a presence in international markets. Certification is granted and validated by an independent third-party entity, ensuring reliability. It also provides

information on the type and extent of TQM practices and accreditation history, serving as a reference point for comparison and evaluation.

9.9. The Relationship between the ISO 9001 and OP

The relationship between ISO 9001 and OP showed a positive and significant relationship between ISO 9001 and OP. This result was confirmed in a case similar to that shown by the study by [40]. ISO 9001 contains significant research focusing on the relevant effects of motivation and the implementation process on ISO 9001 and OP.

According to [41], quality standards have a positive relationship with operational and implementation performance. [42] It was reported that QMS ISO 9001 has the effect of improving organizational performance in terms of product quality and quantity. It is said that this is the impact of QMS ISO 9001 on the performance of the organization because the quality of the products is improving in the organization that has been awarded the ISO 9001 Quality Management System Certification. Actively contribute to the performance of your organization. Therefore, Libyan manufacturing can improve its ability to improve performance and ensure optimal results.

9.10. ISO 9001 Mediating the Relationship between TQM and OP.

The indirect effect of the TQM and OP through the ISO 9001, revealing the mediating relationships was one of the significant objectives of this study, by examining whether the ISO 9001 mediates the relationship between the TQM and OP. Accordingly; it was found the impact of TQM on operational processes was found to be superior to the Libyan manufacturers with ISO 9001 certification. The mediating relationship between TQM and OP through ISO 9001 was supported by the findings from [43] who indicated that ISO 9001 has influenced organisational performance through a number of factors, which can be considered as a mediator between TQM and Organisational Performance. As the companies that are certified with ISO 9001 usually have higher performance than their non-ISO certified counterparts, it shows that there is a positive relationship for the ISO 9001 as a mediator between TQM and OP in accordance with the justification for the adoption of ISO 9001 standard in the manufacturing companies since the ISO 9001 certified companies will enhance their quality management practices to achieve the objectives being set by these companies.

10. Conclusion

It can be concluded that this study focuses specifically on the implementation of TQM in the Libyan industrial sector. Libya's industrial sector not only plays an important role in Libya's economic structure and growth rate, but also in its social development. The purpose of the research was to study the impact of his TQM on OP in the Libyan manufacturing industry. The effectiveness of ISO 9001 as a mediator in the relationship between TQM and OP was tested. An analysis of the study showed results consistent with the Baldrige Performance Excellence program, confirming six key dimensions of organizational management and performance. As a result of measuring the relationship between TQM and OP as a direct effect, a positive and significant relationship was shown. As a result, it was found that the relationship between TQM and ISO9001 shows a positive relationship

It is hoped that the results of this empirical research will help Libyan companies implement his TQM practices and improve organizational performance in the future. We hope that the results will serve and serve as a guide for compliance managers and manufacturing personnel in Libya to improve their organization's performance through his TQM. Information for future research includes length of time or level of commitment to both TQM and ISO 9001. A limited number of KPIs were explored in the current study. It is therefore worth considering the implications of applying TQM to other potential operational policy instruments. Further research on Libyan manufacturers will open the door for raising quality levels and TQM for improving performance.

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