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THE IMPACT OF QUALITY MANAGEMENT ON THE PROJECT PERFORMANCES OF SMEs: A CASE STUDY IN TRIPOLI - LIBYA

KOBİ'LERDE KALİTE YÖNETİMİNİN PROJE PERFORMANSINA ETKİSİ: TRABLUS- LİBYA ÖRNEĞİ [1]

Amir T S AL IDRISI [*], Hatice Şehime ÖZÜTLER [**]

[*] MBA, Istanbul Aydin University, Institute of Graduate Studies, Department of Business Administration, amiridrisi@stu.aydin.edu.tr, ORCID: 0000-0001-7753-2468.

[**] Asst. Prof., Istanbul Aydin University, ABMYO, Foreign Trade Department, haticeozutler@aydin.edu.tr, ORCID: 0000-0002-2213-3483.

ABSTRACT

Total quality management (TQM) processes constitute a basis for an organization's operational, financial, and innovational performances. Besides, an integral to organizational performance, the success and the yield performance of projects are as crucial as having success in project management processes. In terms of operational, financial, and innovational performances, an institution's organizational performance depends on the efficiency of the quality management and its implementation process. Consequently, TQM, which is interiorized to the corporate culture of the institutionalized organizations through the efficiency they have in their management and implementation processes, may have discountinuous impacts for SME performances. Within this context, the study aims to explore the efficacy of TQM for the organizational project performances of SMEs in Tripoli-Libya. According to the data collected by a questionnaire with close-ended questions, TQM has a positive impact on organizational performance, and there is a statistically significant relationship between TQM and operational, financial, innovational performances.

Keywords: *TQM, Quality Systems, Project Performance*

Jel Codes: *O14, L53, L15, D02, L21*

ÖZ

Toplam kalite yönetimi ve uygulama süreçleri, bir organizasyonun operasyonel, finansal ve inovasyonel performansı için temel oluşturur. Ayrıca organizasyonel performansın ayrılmaz bütünü olan sürekli kalite gelişimi için başarılı proje yönetim süreci kadar proje başarısı, yani performans getirileri de önemlidir. Operasyonel, finansal ve inovasyonel açıdan kurumların organizasyonal performansı, kalite yönetimi ve uygulama süreçlerinin etkinliğine bağlıdır. Dolayısıyla, toplam kalite yönetimi (TKY); etkin uygulama ve yönetim süreçlerine sahip kurumsallaşmış organizasyonlarda, kurumsal kültürün bir parçası olarak içselleştirilirken, KOBİ performansı üzerindeki etkileri süreğen olmayabilir. Bu nedenle çalışma, Trablus-Libya merkezli KOBİ'ler için kalite yönetim süreçlerinin organizasyonel proje performansı üzerindeki etkinliğini incelemeyi amaçlamaktadır. Trablus-Libya merkezli KOBİ'lerden kapalı-uçlu anket sorularıyla elde edilen verilere göre toplam kalite yönetimi ile KOBİ'lerin operasyonel, finansal ve inovasyonel performansları arasında anlamlı bir ilişki bulunmakta ve toplam kalite yönetimi organizayonel performansı olumlu etkilemektedir.

Anahtar Kelimeler: *Toplam Kalite Yönetimi, Kalite Yönetim Sistemleri, Proje Performansı*

Jel Kodları: *O14, L53, L15, D02, L21*

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1. INTRODUCTION

Fundamentally showing the basic characteristics of a product or service to meet the customer needs, quality is a measuring parameter with an instrumental process within the product and service fundamentals to bring out the better ones visible in comparison to the same kinds of products and services. Even business conduct, corporate identity, production aspects, and customer relationship management are recognized as the primary components of quality, their parameters differ from one another discipline that it is adapted in order to meet the basic needs (Diaz et al., 2016).

From Crosby's point of view, quality is what meets all the specifications or standards of a product or service when all its necessities are met (Crosby, 1979: 2-23). Crosby emphasizes quality as a definable and measurable factor. He further points out the essentiality of quality to be strategic in the process in the attainment of a continued improvement in business efficiency. He strongly stresses out that quality is related to the prevention from deficiencies in business, not related to the treatments after business failures, and all times process requirements of the business shall be in the focus (Crosby, 1984).

As a strategy, it is the quality bringing up the project economy, and the business as a standout competitor at the current market scenarios. Besides, it provides the business with resilience in satisfying customer needs. Hence its impacts are not limited to the direct beneficiaries of the market, but also, extend its roles for all the stakeholders associated (Buntak et al., 2012)

Juran's quality theory, namely the quality trilogy, on the other hand, focuses on business processes defined by goals with end results. He turns the perspective from a customer-oriented philosophy into a quality-oriented marketing research. His holistic approach to quality depicts that all the engagements and activities attached to the business should be associated with the corporate culture. His trilogy consists of three phases as quality planning, quality control, and quality improvement (Juran, 1986).

It can be observed that even the approaches structuring the quality management systems have different anchors in the attainment of a total improvement in business processes, business outcomes, and management processes. The literature concerning quality system approaches has been showing progress since the early theories have emerged and have been modifying their horizons even keeping the quality factor at the core of the theory. Theoretical and practical advances concerning quality tasks go further. Intensifying information about the literature of quality has evolved and advanced over the years and some approaches are no longer effective in enabling instructional discourse to quality improvement. Therefore, quality standards for services and products have been transforming the standpoints of researchers and practitioners by their everchanging characteristics.

Besides the heavy literature developed in the 20th century, we still have no more effective tools asserting to replace the core principles of quality to have better-performed outcomes. However, having a comprehensive knowledge of the literature is still helping the practitioners in dealing with the current and potential problems for the successful completion of business tasks with satisfactory business returns. The quality management policy that will be followed by practitioners needs to have a vision broadening the perspective which might be relative, macroaggregated, underestimated, or neglected before. Therefore, this study is an attempt to investigate the impact of quality management on business performance for the SMEs in Tripoli-Libya in order to ascertain how they perform well through their management and implementation process. Because SMEs are the majority of the economy in Libya, it is expected to identify the current achievement and potential gains that the economy may have in the long run from a well-structured TQM policy.

2. TQM AND BUSINESS PROJECT PERFORMANCE

2.1. TQM

The overall framework of TQM has been drawn by the early studies of W. Edwards Deming, Joseph Juran, Kaoru Ishikawa, and Philip Crosby even none have been preferred to theorize the term (Hackman&Wagemen, 1995; Petersen, 1999). For instance, according to Crosby, TQM is a quality assurance policy that intends to organize the flow of information for the benefit of building an efficient path associated with procedures specifying what the people are supposed to do (Crosby, 1979; 2). However, Crosby is critical of the term TQM because he thinks it may guarantee "partial" or "minimal" quality management which consists of actions of a group of people focusing on end results (Crosby, 1979; 3-4). Crosby's approach to quality is based on "zero-defect" policy- do it right the first time- and he tells the cost of quality is the expense of doing things wrong for some wrong companies which usually reaches %23 of their sales in manufacturing and exceeding this amount in service companies (Crosby, 1982; 11).

As Crosby did, Joseph Juran, the founder of the "theory of trilogy", which has previously been conveyed, has not used the term TQM in his theory even he has been recognized as the first contributor to the development of TQM (Juran, 1986). His theory of trilogy can be detailed by the attached tasks to the trilogy of quality between quality planning, quality control and quality improvement as (1) determination of quality goals, the institution of implementation planning, the institution of resource planning, expression of goals in quality terms and creation of the quality plan would be an integral part of quality planning; (2) monitoring company performance, comparing business objectives with achievements and taking action to reduce the gap needs to get well integrated to the quality control mechanism; (3) reducing the defects, enhancing logistics, improving the morale of employees, improvement in company profitability and customer satisfaction should be prioritized for quality improvement (Beckford, 2002; 106,107).

Deming, on the other hand, is recognized as another pioneering management guru to TQM even if he has not used the term TQM to theorize his management approach to quality. His approach is based on a continuous improvement in the 14 points he has stated. He defines the prevailing system of management as a prison leading the companies to decline and that the companies should escape. He asserts that in the 1950s because Japanese companies implemented quality control as a system of production, Western World was losing out the competitive advantage (declining) (Deming, 1991). Even the quality management was in the first order for Deming's theory of management, it was Anderson et al. who has conceptualized his theory of management to TQM based on a Delphi study (Anderson et al., 1994).

Ishikawa's company-wide quality control method is supported with the quality circles technique using the 'seven tools of quality control' (Beckford, 2002; 97,98). Seven tools of Ishikawa are: the use of Pareto charts to define the major causes of problems; use of Ishikawa's fishbone diagrams to visualize the cause-effect relationships through processes; stratification analysis of the data in a hierarchy; use of checksheets to have a record of quality; use of histograms to display frequency of values of quantities; use of scattergraphs to clarify the correlations and use of control charts for statistical process control (Beckford, 2002; 101). Another important, revolutionary approach Ishikawa introduced to the TQM literature (Beckford, 2002; 93-101) would be his strong emphasis on human relations and simplicity with all aspects through total quality control.

Total Quality Management (TQM) is a scientific process with specific steps to gather the related information and analyzing it. The purpose of TQM is to enhance the performance of the working bodies in a business. Purposefully, it helps in reducing the risks which are

hurdles in the process. Implementation of TQM, therefore, reduces the risk factors, organizes the commitments for timely implementation of business affairs and it results in a decrease in the operational costs of a business. Like every business process, TQM has to bring about growing consumer satisfaction, profitability, and productivity. For example, Toyota, as one of the organizations by the vanguard of this revolution, no longer focuses on quality guarantee through inspection and remodeling, but on growing quality control mechanisms for flawless operations management in every step of the production. Furthermore, the quality of a product is as proper as the bottom quality element remains inside. Therefore, many producers who hold excellence in production call for complete total quality management that includes the quality of suppliers and supply chain management as well (Subedi et al., 2009). TQM in the business environment has faced tremendous modifications and enhancements quite positively, and it was proven as one of the essential strategies that would be implemented in any organization to achieve organizational competitive advantages. TQM parameters are based on the idea that all company workforce should collaborate with every business department for high value-added products and offerings that meet customer demands for a continuous improvement in organizational performance and customer satisfaction. The primary strategy to minimize manufacturing defects and mismanagement is to focus on the controlling function of management (Qahtani, 2015).

2.1.1. Impact of Quality Implementation on Business Projects Performance

There is a strong relationship between quality and business project performance as they both have a strong correlation with effective project implementation. Hence TQM practices are widely encouraged as a remarkable tool of quality in project implementation.

On the other side, there have been studies conducted and produced critical results such as Harari did. In his study, Harari underlines the reality that among the TQM-based programs in the US and Europe, only from one in five in average to a maximum of one in three have resulted in significant improvements in quality, financial returns, competitive advantages, and productivity. According to his point of view, because TQM gives priority to internal processes instead of external intangible results– which are more crucial for non-manufacturing activities or activities of non operations groups–: it sets minimum standards limiting the potential; develops its unique bureaucracy; delegates the quality with competents instead of empowered employees and stakeholders; excludes cross-functional organizational reforms; disregards the essentiality of a satisfactory compensation policy; is not empathetic and enthusiastic towards outside partners; given in the hands of experts so often becomes a marketing tool as a program rather than providing measurable quality results; once covered by TQM programs detracts innovative culture from the business's corporate culture; insulates the system from emotions and EQ (Harari, 1993). Harari's critics mainly address the problems associated with nonmanufacturing products and customer services attached to the business.

Another issue that must not be underestimated in TQM is the implementation process where the TQM practices give their results. That's why TQM programs are so often criticized for their implementation processes. This point brings the TQM discussion to another classification as the formal and informal implementation of quality standards.

Prajogo and Brown, for instance, structure their studies across the implementation process of TQM. Their results prove that TQM practices do not always guarantee a positive change in performance on project implementation due to the possibility of informal or poor formal TQM implementation of corporations (Prajogo&Brown, 2004).

Hence there have been mixed outcomes in researches based on diverging analysis techniques. TQM's impact on business project performances is stretched towards the kinds of products and services and also some practices are adopted rather than going for a complete TQM

programming that has been recognized universally. In a nutshell, it is the effective top management who has all those reigns to better make of quality practices for improved performances in project implementation. Quality plays a pivotal role in the success of a business in this modern era for sure. Describing the importance of quality for the company performance, quality management suggests improving the efficiency and competitiveness of enterprises with an integrated approach that links the whole organizational functions to meet with the customer needs and organizational objectives (Wahjudi et al., 2012).

2.2. Project Management and Organizational Performance

Project management is the scientific approach in the attainment of the beneficial change that is targeted by the project through identifying the task objectives and through organizing the actions to be taken by the activities of a group of people. Here, the beneficial change is the determinant of the project's success within probabilities of getting projects finished on time, within the predetermined budget and so that the actual performance of the project (outcome) does the expected result. Achievement in any two out of three performance objectives would be guaranteed by project management (Barnes, 1990; 3-4). This is known as the 'iron triangle', showing the triple constraint of time, cost, and scope over project success (Naughton, 2013). The iron triangle asserts the assumption that quality, cost, and time go together.

Pollack et al. (2018) and Albert et al. (2017), for instance, state that Barnes puts performance at the centra instead of quality, lacking the importance of quality factor. Atkinson replaces quality with performance (Atkinson, 1999), and Pollack et al. also support that time, cost, and quality are highly interconnected concepts while scope does not occur in any network diagram. Requirements and/or performance, on the other hand, appear in network diagrams with lower significance than quality due to their inconsistency (Pollack, et al., 2018; 545).

Determination of critical success factors is first order in project success. Even these critical factors differ from one to another project due to project-specific issues, they can be gathered under the main headings of project management actions, project-oriented procedures, project-related factors, human-related factors, external environment from a broader perspective (Alias, 2014; 67).

The success of projects is determined by the ability to answer the three questions of **''What factors lead to project management success?'', ''What factors lead to a successful project?''** and **''What factors lead to consistently successful projects?''** at once, not alone individually to link the project success with the corporate success that brings higher returns for both (Cooke-Davies, 2002; 185). On-time and on-cost performances are key leading indicators for project management success. However, transmitting project management success into project success would not be as easy as achieving project management success. To bridge these two, the interests of the stakeholders and the benefits they expect should be balanced by the actions of operations management with the cooperation between the project team and the customer. In terms of consistency, on the other hand, a corporate project management practice should be developed by a corporate structure (Cooke-Davies, 2002; 185-189).

The use of a well-organized "performance measure record sheet" is a simple solution for increased project performance which constitutes qualified "performance measures". These measures must be clear and simple, explicit in formulation and data sources. This record sheet should explicitly define: the task in the title, aim, its correlations, specific goals, notation, time intervals of the measurement, who keeps the records, data sources, who interprets the data, what is being gauged to control, and any further instructive pieces of information (Neely et al., 1997) Therefore, a well-scaled performance measure record sheet is integral to project performance measurement.

Measuring overall performance is crucial for the success of project implementation in an organization. Successful project implementation largely depends on giving solutions to the rising problems, continuous removal of conflicts, keeping an eye on every level of communication, and meeting project objectives within the stipulated time. Sometimes, it looks smooth and easy to ensure project performance. In-depth interaction may come up with various kinds of challenges. But it purely depends on the nature of the project and its implementation process. Sometimes the challenges are tiny but sometimes they have greater influence over the project performance and that would end in negative results (Liu, 2018). The crucial point for success in project management is the organic link to the organizational performance, and creation of a corporate culture.

Thefore, the organizational hierarchy with specific tasks is essential to convert project performance into organizational performance. In terms of organizational performance, each specific management deals with each specific department with a pivotal role in hands of each one. The study of García-Alcaraz et al. has given the findings that management engagement is the most important variable to ensure TQM, but it relies on the quality department's role in enforcing quality policy and ensuring customer loyalty. Similarly, sensitivity analysis reveals that a high degree of management engagement guarantees high efficiency in quality departments and good quality policies, thus leading to customer loyalty (García-Alcaraz, 2019). Organizational performance, on the other hand, can be assessed from three different dimensions as financial, operational and innovational performances in which each parameter reflects different aspects of organizational success.

2.2.1. Operational Performance (OP)

Operational performance which reflects the effectiveness of project performance stands out as a visible indicator. It helps in determining the company’s overall performance as being a leading component. However, it has different measurement structures according to a company’s primary requirements. Hence it varies in its structures and functions as per the need. There are different elements considered to be important areas in operational performance. Among various other elements, value-added in manufacturing, product quality, production enhancement with newish standards, and market shares are greatly taken in it (Silva and Ferreira, 2017). Another issue that should be considered is the multidimensional relationship between financial and operational performances since financial performance is heavily influenced by some operational performances such as efficiency-which is the outcome of the internal management performance. Besides its incapacity to adjust a company’s competitive strategy into operational performance, activity-based costing (ABC) is a better measure of accommodating financial measures with operational performance (Silva and Ferreira, 2017).

2.2.2. Financial Performance (FP)

Financial performance is another dimension of overall organizational performance. Companies determine the general performance of the business with two major sub-performing areas as operational and financial. Hence, financial performance plays a significant role in contributing either positively or negatively in determining the overall company performance. The inflow of certain assets has to be greater than the outflow of certain assets to put the financial performance of a company in a positive direction. Earnings per share, profitability and growth in sales are some of the major elements among others in financial performance. Therefore, financial performance is recognized as a major contributor to a company’s progression and how companies are running. In terms of controlling the financial performance of TQM, profitability and liquidity ratios are considered. The rate of return on equity, the rate of return on assets, the rate of use of assets, and the profit margin ratio are recognizable profitability rates while liquidity ratios may differ from industry to

industry. For instance, Basheer and Shawaqfeh use the cash balance ratio, legal liquidity ratio, and the proportion of cash/ assets as selected ratios for controlling the financial performance in the banking sector. (Basheer et al., 2015; 68-71).

Another issue concerning financial performance is associated with the uncertainty of the business environment. In terms of financial performance, flexibility tends to result in an improvement in financial performance. However, the cost of flexibility is higher in predictable environments, resulted in lower financial performance and corresponding to an economic loss for the business. (Silva and Ferreira, 2017; 19-21). "Uncertainty" can be the status quo of the business environment for some sectors, locations, or economies which should be considered carefully in all cases.

2.2.3. Innovational Performance (IP)

Innovation can be defined as new tools, ways, or processes accomplishing similar or more difficult-ironically sometimes easier- tasks in significantly different efficient forms.

Schumpeter's approach through innovation meets with the TQM to some extent since his analysis of "economic change", which is then turned into "creative destruction" (Schumpeter, 1994; 81-133), starts with the pre assumption that the independency of consumer wants causes "new combinations" for the production processes (Schumpeter, 1961;65-14-56). Any change in this combination may create innovation in the forms of introducing a new product or product quality; introducing a new way of production; opening new markets; exploring new sources and solutions through the supply chain; industrial reorganization or a change in market structure (Schumpeter; 1961; 66). That is why according to him **"The sediment of the social value system is the price system."** (Schumpeter, 1961; 56). All these possible combinations are expressed in this social value system. Hence the innovative potential of the organizations too. This assumption brings us to the term innovation diffusion which is **"the process of the market penetration of new products and services that is driven by social influences, which include all interdependencies among consumers that affect various market players with or without their explicit knowledge".** (Peres et al., 2010; 92). In connection with this diffusion effect, new product development (NPD) is recognized as a determinant for company survival due to its inclusion both of the exploratory –new alternates to existing products, solutions, or tools– and exploitative –refinement of the existing technology, knowledge, solutions– learning processes to company innovative performance. The stronger correlation between these two learning processes is the higher return in innovative performance for the organization (Gima-Atuahene et al., 2007). The industries based on technology products are considered to be one of the best modern examples. They have managed to increase their shares by a shift from tangible resources like hardware products to more hi-tech innovation-based designs even including the emotion offering ones.

On the other hand, from the TQM's perspective, the terms innovation and kaizen can also differ from one another following Imai's approach such J. Juran emphasizes as well (Imai, 2019; Juran, 1998; 267). According to Imai's approach, large-scale, discontinuous improvements in a function with different ways meets with the innovative performance more while a better transformation over an existing function with small-scale continuous improvements meets with the term kaizen as a determinant to quality improvement. Innovation (reengineering) on the other hand, reduces company inefficiency, lowers redundancy on company operations, and collaborates with operational performance more (Imai, 2019; Juran, 1998; 788). Schumpeter also emphasizes the discontinuous nature of innovations as well (Schumper, 2003;87-107). However, there is also a literature suggesting the idea that TQM practices can hinder innovational performance in terms of TQM since the first-order issue is the realization of quality performance instead of innovational performance. Therefore, innovational performance driven by TQM could be an "unintended"

result of policy implementation, most probably by an innovational process implementation (Prajogo and Soahal, 2003). Slater and Narver express this conflict by the confusion we have in differing being "market-orientated" and "customer orientated". Market orientation does not mean marketing orientation as enjoying a customer-led company performance (Slater and Narver, 1998). But the creation of a market-oriented generative learning process leads to innovational performance (Senge, 1990 cited Slater and Narver, 1998; 1003). Besides all, being a management innovator and targeting management processes instead of business processes are as critical as operational innovation. Linux's open-source development, DuPont's pioneering role in the development of capital budgeting techniques, Visa's consortium solution, P&G's brand management approach are just some well-known examples of management innovation (Hamel, 2006).

3. TQM in LIBYA

3.1. Quality Systems in Libya

Libyan practitioners, in terms of physical production and its functions, experienced lots of challenges to ensure their presence in the global markets, and for being competitive enough in dealing with their competitors across the globe. TQM has been in practice with many inductions and deductions within developed countries. Even TQM practices have lately been adopted in Libya to ensure the companies are focusing on their services, products, and employee productivity. Also, they started using TQM models. Industrialization in Libya has been in a pivotal position in Libya's market visibility with many improved and effective impacts on its social and monetary affairs. The quality systems adopted through the industrialization of Libya have been much more effective on its exports, and have positive contributions to its overall economy. Even Libyan markets continue to have issues with competing in the world market, there is a strong will inside the industrial sector to grow and to use the quality systems for being successful while, at the same time, keeping in view the Libyan socio-culture alive.

The harsh reality of competition that the enterprises have to face is the active players in the global marketplace where all are self-sufficient economies due to their competitive advantages. The key issue is not simply to run an enterprise but the way to preserve the enterprise. Ensuring company profitability with short-run projects as well as long-run projects alone is no longer a sound policy. Libyan manufacturing companies need to strengthen their capabilities by improving company performances and providing exceptional products and business solutions to survive under competitive markets. Therefore, the adoption of a well-recognized paradigm, improving company performances, and exceptional product quality are imperative for Libyan enterprises (Elfargan, 2018).

3.2. Quality Systems in Libyan SMEs

Libyan SMEs find the quality system as an effective pathway for smooth selling even different elements are inlined with the quality systems. Because TQM consists of business structures, resources, procedures, and responsibilities, it is difficult for a company to buy or to start a system unless having TQM in practice. TQM is related to human resources and time, revolves around the functions which need people and time management. Quality systems in Libya have evolved over time. It has changed with many developments and helped organizations to excel with different new options such as gap analysis. The new developments in the process of applying TQM are based on three new frameworks which are related to the consultants, assessment techniques, and educational pilots basis. In the process of TQM application across the Libyan enterprises, generic differences have been noticed between SMEs and large enterprises. Those differences are related to the business structures,

human resources, behavioral and cultural norms, business processes, and business links. Libyan SMEs have limited and flat structures having greater values for high ups of the company with a low standard customized approach. They seem to have very basic and informal quality systems with greater lenient approaches. Their systems work under simple activities which ultimately aim to support their capacities and help build in contacts with entities concerned. In terms of the application process of TQM, some researchers support the idea that SMEs can undertake some components of TQM as efficiently as large companies, including training practices and the use of performance measurement tools while some other researchers suggest that there are further drawbacks for SMEs in TQM. Even there is a growing literature available in the area of quality control for SMEs due to their dominant role in most advanced and developing economies, however; there are relatively few studies about quality control that encompass Libyan SMEs (Elfargan, 2018). To fulfill this gap in the literature, the impact of quality systems on Libyan SMEs project performances will be investigated in the next sections.

4. LITERATURE REVIEW AND METHODOLOGY

4.1. Literature Review

There are various studies in the literature that search for the impact of TQM and quality systems over different performance measures. Following a regression analysis, Abd Wahab & Abdesamed (2012) demonstrates the significant impact of TQM over Libyan SMEs' financial performances at the context of having access to financial resources and their dependency to economic funds. Consistent with Wahab & Abdesamed (2012), Pham (2020) discloses the positive correlation between TQM practices and financial performance by the mediating role of non-financial performance factors with a structural equation modeling (SEM) for the Vietnamese enterprises. Following the similar technique, Veselinović, Kulenović, Turulja, & Činjarević (2020) unfolds the strong correlation between TQM and firm performance for the South-Eastern European countries by the mediating role of entrepreneurial orientation through innovativeness, risk-taking, and proactiveness. Sila (2020) elicits the role of TQM in the attainment of better financial, market, and corporate social performances for Turkish firms with another SEM model. Yas, Alsaud, Almaghrabi, H., Almaghrabi, A., & Othman (2021) investigates organizational performance and TQM relationship for the manufacturing industry in Saudi Arabia. Study findings reveal the positive contribution of TQM practices for enterprises in their marketing and operational performances, but not in their financial performance. The survey conducted with 500 CEOs among the SMEs in Kuwait, Sawaean & Ali (2020) displays the mediating role of TQM, and reveals that entrepreneurial leadership is capable of improving organizational performance once it is supported with TQM practices. Within the same scope, Jumady (2020) unearths the positive role of TQM in financial performance for the Islamic Banks in Indonesia through effective leadership. Zaidi & Ahmad (2020) unfolds the five dimensions of TQM for Malaysian manufacturers in searching the impact of TQM over business performance. The results ratify the positive correlation between TQM and financial performance. However, the study findings give no significant support for the relationship between TQM and operational performance. Dehghani & Azar (2020) upholds the mediating role of innovational performance for garment exporting companies in the attainment of competitive advantages through TQM. Sciarelli, Gheith, & Tani (2020) points out that TQM is capable of ensuring improved organizational and innovational performances even for the higher education in the public Universities of Naples-Italy. Instead of analyzing the casual relationship, Shibani, Ganjian, & Soetanto (2010) focuses on the weaknesses of the Libyan enterprises in the construction industry while assessing business performance by effectiveness factors. Being

critical success factors, the study findings attribute the poor performance of the Libyan construction industry to the lack of management commitment and lack of knowledge in QM due to their direct link to the implementation process. Lastly, the study that was followed for setting the hypotheses tests and structuring the study scale, Mansor & Kurt (2019) testifies the positive relationship between TQM practices and business performance of the firms in Istanbul concerning their financial, innovational, and operational performances.

4.2. Methodology

For the study, a descriptive research method is applied to both analyze the demographic aspects and to determine its reasons and potential impacts. Therefore, a deductive reasoning approach that deals with the creation of an established theory-based hypothesis is followed through the study (Lindlof & Taylor, 2017; 1-10).

4.2.1. Data Sampling & Target Population

The population target and aim of the study are the SMEs representing the majority of the business structure in Tripoli – Libya, and their trend analysis towards using quality programs or systems. Empirical data were collected through a random survey of 272 respondents who were attached to the quality systems with varying rates consisting of senior managers, mid-level managers, quality experts, and employees.

Random sampling takes the chosen units in between, and the study uses random sampling for the data collection. The number of respondents is calculated by the sampling formula which is based on the database of the population (Olken&Rotem, 1986). The reason for following the random sampling is its capability in simultaneously allowing the study to use different techniques within it (Rachel, 2008; 682-684). The questionnaire consists of close-ended questions where a five-point Likert Scale was used representing a range of altitudes from strongly disagree to strongly agree.

Table 1: Sectoral Distribution of Companies

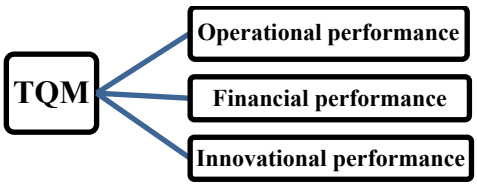
	FRQ	%	Valid %	Cumulative %
Oil Refining	2	.7	.7	.7
Industrial	46	16.9	16.9	17.6
Textiles	43	15.8	15.8	33.5
Cement	32	11.8	11.8	45.2
Agriculture	37	13.6	13.6	58.8
Bank	22	8.1	8.1	66.9
Medical	43	15.8	15.8	82.7
Services	18	6.6	6.6	89.3
Other	29	10.7	10.7	100.0
Total	272	100.0	100.0	

4.2.2. Specification of Hypothesis Testing

As discussed earlier, the literature supports the general assumption that there is a strong relationship between quality management practices and producing positive outcomes through effective management processes. Therefore, SMEs having TQM in practice is no exception and the positive returns are observable through their project performances and structural changes. These outcomes give a vibrant scope for making the potential use of TQM more frequent so that improvements may be ensured at all levels at the same time in dealing with company or project performances (Jong et al., 2019).

Mansur & Kurt (2019) follow operational, financial, and innovational performances to evaluate the impact of TQM on business project performances. By following a similar approach, this study model will use operational, financial, and innovational performances individually to evaluate the performance of business projects as the dependent variable while quality system implementation will be assessed as the independent variable (Mansor & Kurt, 2020). However, the scale was developed by the researchers to better quantitate the performance parameters, and the respondents were provided with the required meta data in order to eliminate subjectivity. Table 2 illustrates te model spesification of the survey analysis.

Table 2: Conceptual Framework



The hypothesis that will have been tested with this questionnaire are:

H_{A0}: TQM has significant impact on OP
H_{A1}: TQM has no significant impact on OP

H_{B0}: TQM has significant impact on FP
H_{B1}: TQM has no significant impact on FP

H_{C0}: TQM has significant impact on IP
H_{C1}: TQM has no significant impact on IP

4.2.3. Statistical Analysis of Reliability

Cronbach alpha (α) reflects the reliability of measurement concerning the capability of a set of scale items in detecting and interpreting individual differences through the questionnaire (Cronbach, 1951; 297). Therefore, internal consistency of the scale is observable via this reliability coefficients similar to a measure of equivalence (Cronbach, 1947; 6). Being an estimator of internal consistency, suggested reliability level of alpha coefficient should be equal or greater than .70 where for applied researched it is recommended to have a level above .90 according to the most widely referenced recommendations for the reliability coefficient (Peterson, 1994; 381, 382, Cortina, 1993; 101, 102, Tavakol & Dennick, 2011; 53, 54). An alpha range between .90 to .95 reflect either an excellent or strong reliability (Taber, 2018; 1278). Therefore a reliability level above .70 would suggest that our scale is reliable and capable of reflecting statistically significant results.

Table 3 reflects the Cronbach alpha levels both for each item and for an average value of all items in the scale. It is seen that Cronbach alpha coefficients for each dimension of the scale ranged from 0.78 to 0.87. A proof of scale reliability, the reliability estimate for the entire scale is 0.94 for the twenty-nine items as shown in Table 2.

Table 3: Reliability Test Results

Variable	Cronbach alpha (α)	N
TQM	.874	15
Operational Performance (OP)	.789	5
Financial Performance (FP)	.784	5
Innovational Performance (IP)	.849	4
All variables	.945	29

However, a higher level of α does not guarantee a strong intercorrelation among items as it should be. Futhermore, in some situations, items with low intercorrelations may also suggest interpretable scales too (Cronbach, 1951; 324-332). That is why based on the assumption that both variables are random, correlation coefficients, measure the strength of association among the variables investigated (Gujarati &Porter, 2009; 20). The Pearson correlation coefficient ranges between ±1 from a perfect correlation with a value of +1 to zero correlation with a value of -1 (Taylor, 1990; 36-37, Rodgers & Nicewander;59-61). Values ≤ .35 are assumed to have weak correlations, values from .36 to .67 are interpreted as modest or moderate correlations, the range between .68 to .90 represents a strong or high correlation where a value ≥.90 is considered to have a very high correlation (Taylor, 1990; 37).

Table 4: Correlation Analysis

		TQM	OP	FP	IP
TQM	PC*	1			
	Sig. (2-tailed)				
	N	271			
OP	PC*	.791**	1		
	Sig. (2-tailed)	.000			
	N	271	272		
FP	PC*	.769**	.798**	1	
	Sig. (2-tailed)	.000	.000		
	N	271	272	272	
IP	PC*	.748**	.820**	.845**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	271	272	272	272
**Correlation is significant at the 0.01 level (2-tailed) PC*Pearson Correlation					

Table 4 highlights the relationships between the variables that are used in the study by Pearson correlation coefficients. The Pearson correlation coefficients table indicates that the relationship between TQM and OP (.791), TQM and FP (.769), TQM and IP (.748), OP and FP (.798), OP and IP (.820), an lastly FP and IP (.845) all represent a strong or high correlation in favor of the reliability of the scale.

To support Table 4, factor loadings are represented in Table 5. Similar to correlation coefficients, Eigenvalues reflects the correlation between a variable and a factor. Therefore, factor analysis emerges as a solution to avoid from multicollinearity problems (Gujarati &Porter, 2009; 346). Similar to component loadings in principal component analysis (PCA), it allows to monitoring the principle variables by their variances (Mishra, Sarkar, Taraphder, Datta, Swain, Saikhom, Panda, & Laishram, 2017; 63-76). Examining how much of a variable is explained by a factor, factor loadings range from -1 to 1 where a loading close to zero is not preferable due to the incapacity this factor might have to influence the variable studied. Even there is no consensus on its significant means, so often factor loadings with $|.30|$ are considered as a bare minimum. However, in some fields this minimum for a

significant means may reach │.40│ or │.50│(Morin, Olsson, &Atikcan, 2021; 116, 117). Factor loadings in Table 5 reflect that all factors meet with the bare minimum of │.30│or a higher confidential level of │.40│. On the other hand, if the significant means is assumed to have │.50│, then 3 out of 29 items show poor correlation with the survey.

The suitability of the industrial climate for TQM in Libya, data collection for continous quality improvement and investments for TQM are the factors performing less compared to the avarage factor loading. This may be due to the differences in perceptions, respondents' position of power, or their capabilities to have access and control in company informations.

Table 5: Factor AnalysisFactor

	Factor Loading
TQM: Do you agree that …….	**EV: 5.74% of Var: 38.29**
Your company has a well-defined vision and a mission statement	.771
Your company has a well-defined and organized quality statement	.713
Your company's organizational chart is well organized	.742
Your company has well-defined strategic, tactical, and operational plans	.739
You are well informed on TQM	.726
The industry/sector you run, your business suits for TQM systems	.674
Your industrial/sectoral climate in Libya suits TQM systems	.415
The implementation process of TQM to your company and its adaptation to the system are difficult	.515
Your company invests well enough in TQM practices	.477
TQM approach increases the financial performance of your company and helps in the achievement of your company goals in your strategic plan	.585
Your company implies continuous improvement tools (brainstorming, check sheet, and other statistical process control) for TQM regularly	.613
Your company collects a wide range of data and information for processing on company performance hence for continuous quality improvement	.467
From top to first line-level managers provide visible leadership in maintaining the business environment to supports quality improvement	.608
TQM facilitates the accomplishment of your business projects	.523
TQM supports your company for being global	.565
Operational Performance: Do you agree that …….	**EV: 2.71% of Var: 54.35**
Your company's productivity increased by standardization and reduced defects	.712
Your company's performance increased by enhanced corporate culture and employee commitment	.732
Your company increased its market share by customer loyalty	.745
Your company became advantaged by market power and strengthen your supplier network	.730
Your company has an overall improvement on KPIs	.766
Financial Performance: Do you agree that your company did well on ...	**EV: 2.68% of Var: 53.70**
Earning margin	.709
Return on capital employed	.783
Operating leverage	.742
Financial leverage	.733
Total leverage	.694
Innovational Performance: Do you agree that your company …….	**EV: 2.75% of Var: 68.85**
Increased its returns from R&D activities	.774
Explored and commercialized profitable and unique business solutions	.845
Tends to invest more in innovation	.830
The increased added value of its products	.867

EV: Eigenvalue, Var.: Variance

4.2.4. Hypothesis Testing

Regression analysis with ANOVA results proves the significance of each selected factor over TQM at different factor levels.

Table 6: Model Summary (TQM&OP), (TQM & FP) and (TQM & IP)

Model Summary (TQM & OP)				
Model	R	R_2	Adj. R_2	SE
1	.791a	.625	.624	.56840
a. Predictors: (Constant), TQM				
Model Summary (TQM & FP)				
Model	R	R_2	Adj. R_2	SE
1	.769a	.591	.590	.59467
a. Predictors: (Constant), TQM				
Model Summary (TQM & IP)				
Model	R	R_2	Adj. R_2	SE
1	.748a	.559	.558	.71494
a. Predictors: (Constant), TQM				

According to the regression results in Table 6, even if correlation between TQM and OP, FP and IP are close each other, OP (.791) outperforms FP (.769) and IP (.748). On the other hand, showing similar matrices, R_2 values depict how much of the variation in OP (.625), FP (.769) and IP (.748) can be explained by the TQM. The regressions for the models TQM-OP, TQM-FP and TQM-IP indicate that the 62% of the variations in OP can be explained by TQM practices while its impact becomes more significant for IP (%74) and FP (%76).

The study results for the Tripoli case indicate that the TQM practices generate the highest impact on FP for the enterprises. However, these results must be interrelated with the coefficients of beta.

Table 7 establishes the analysis related to the coefficients of beta for TQM to OP, FP, and IP. Overall beta values (B) prove the positive correlation between the variables. According to the test results, from the highest score to the lowest one, the use of one unit of TQM factor is associated with 1.130, 1.030 and 1.004 unit increases in IP, OP, and FP respectively. Once these findings are corporated with Table 6, one can suggest that TQM practices have a nonignorable impact on overall company performance–consisting of OP, FP and IP. However, the SME structure in Tripoli may have some difficulty in converting the achievements of OP and IP into financial achievement as FP. This may be due to the economic instabilities that the region experiences or because it takes time an organization to convert OP and IP into a corporate culture that fully utilizes these attainments for financial returns.

Table 7: Regression Analysis for OP, FP, IP

Coefficients OP						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.036	.162		.221	.825
	TQM	1.030	.049	.791	21.183	.000
Dependent Variable: OP						
Coefficients FP						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.097	.169		.572	.568
	TQM	1.004	.051	.769	19.731	.000
Dependent Variable: FP						
Coefficients IP						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.296	.204		-1.454	.147
	TQM	1.130	.061	.748	18.482	.000
Dependent Variable: IP						

ANOVA results given in Table 8, show the significant value of 0.000 for the measured variables per se. The regressions for TQM to OP, FP and IP all have a significance value < 0.05 indicate that the regression analyses also support the three hypotheses of this study. Shown in Table 8, the regressions for TQM to OP, FP and IP all have a p-value (0.00) of <0.05 at a 5% confidence interval means that the model is statistically significant and all hypotheses are supported.

Consequently, for the business projects undertaken by the Libyan SMEs, the hypotheses suggesting that the TQM practices have a significant impact on their OP, FP and IP is accepted. The three hypotheses that were tested in this study have validity for our sample.

Table 8: ANOVA Results for OP, FP, IP

ANOVA OP						
Model		SS	Df	MS	F	Sig.
1	Regression	144.975	1	144.975	448.737	.000b
	Residual	86.907	269	.323		
	Total	231.882	270			
Dependent Variable: OP						
b. Predictors: (Constant), TQM						
ANOVA FP						
Model		SS	Df	MS	F	Sig.
1	Regression	137.678	1	137.678	389.320	.000b
	Residual	95.128	269	.354		
	Total	232.806	270			
Dependent Variable: FP						
b. Predictors: (Constant), TQM						
ANOVA IP						
Model		SS	Df	MS	F	Sig.
1	Regression	174.595	1	174.595	341.576	.000b
	Residual	137.498	269	.511		
	Total	312.093	270			
Dependent Variable: IP						
Predictors: (Constant), TQM						

5. CONCLUSION

The data analysis in this study has endeavored to bring out the impact of TQM practices on operational, financial, and innovational project performances of SMEs in Tripoli-Libya. In response to our three research questions that if TQM has a significant impact on OP, FP and IP for the business projects undertaken by the Libyan SMEs, the study findings provided empirical evidence that implementation of TQM tools significantly enhances operational, financial, and innovational project performances of SMEs.

Because the data sample was structured across SMEs following full or partial TQM practices, it has proven strong evidence about the importance of the implementation process by offering 1.13, 1.03 and 1.00 unit increases in IP, OP, FP with a unit increase in TQM.

However, according to the study findings, SMEs in Tripoli refers to have a gap in converting the OP and IP into FP. The reason of this gap is crucial for the future of SMEs to avoid from the misuse of resourses and business loss. This gap may either occur due to structurel problems that should be fixed such like economical and political instabilities or it can be expected the enterprises to increase their returns in financial terms after converting the achievements of OP and IP into a corporate culture. The second option is acceptable since it takes time a company to create a corporate culture as an outcome of operational and innovational performances. Unless reaching this point, it is less likely an enterprise to convert its OP or IP into financial returns, and the corporate culture to be fully utilized for financial gains.

The industrial, textiles, cement, and services sectors seemed to have lead to successful returns by use of TQM systems since they agree with the statement that the use of TQM tools suits their industries in Libya. On the other hand, almost all the responding sectors depicted their engagement to TQM systems with their respective quality policy statements and their active use of KPIs in quality management.

In terms of TQM implementation and success in projects, leadership and a commitment to the management process from top to the first-line management are important factors that lead to company performance and project success. For the Libyan SMEs case, it is concluded in cross-tabulation analysis that around all the responding employees aware about the company's quality policy, mission, and vision statements along with the company's strategic, tactical and operational plans. However, dissatisfaction in terms of the implementation processes and investments in TQM is high. An interesting point is that approximately half of the correspondents think TQM helps their company for being global as opposed to other half.

The close returns about operational, financial, and innovational performances strongly support that the outcomes of TQM are included in company project performances proportionately as a corporate culture.

Most of the employees working for industrial, textiles, cement, and services sectors seemed to have adopted TQM Systems within their respective companies which signifies the importance of commitment to TQM practices from top to the first-line level of company management. The study findings supported that the use of TQM systems for SMEs in Libya-Tripoli would offer higher operational, financial, and innovational returns in company performances and there is a significant strong positive correlation between TQM and companys' operational, financial, and innovational performances.

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