

The Impact of Total Quality Management for achieving Sustainable Project Management

تأثير إدارة الجودة الشاملة على تحقيق الإستدامة في إدارة المشاريع

by

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Abstract

Introduction: The implementation of quality management practices in the project management has been associated with the increased outcomes of the projects. The application of Total Quality Management tools and techniques have been studied in the research and its relationship with the quality of services provided by the public organization aligned with sustainable project management outcomes.

Aims/ Objectives: The main purpose and objective of this quantitative research study is to recognize the role and the impact of total quality management (TQM) in attaining a sustainable project management across the public organizations in the UAE.

Methodology: The research has adopted a quantitative approach towards data collection where different sources of data have been selected for gathering data for the research. Data was gathered using survey from 100 respondents working who were project managers, quality managers, and project associates, particularly working in DEWA, RTA, Dubai Customs, and Dubai Municipality. The data analysis was done using SPSS software where regression analysis; ANOVA, t-test, and correlation were conducted to test the research hypothesis.

Findings and Results: The results from the correlation analysis highlighted that leadership have the highest positive 78.1 % ($p=.000<0.05$) correlation with economic sustainability, while has lowest positive 41.7% correlation with a customer focus. The results further showed that strategic planning has the least positive 32.1% correlation with economic sustainability, while the highest positive 81.4% correlation with social sustainability. The correlation analysis also shows that customer focus has the lowest positive 24.3% correlation with economic sustainability; however, it has the highest 41.7%

positive correlation with leadership. Similarly, measurement analysis and knowledge management have the least positive 29.1% association with customer focus, while it has the highest 72% correlation with strategic planning. Workforce focus has the least positive 30.4% association with social sustainability, while it has 64.5% highest positive association with operation focus.

H1(Leadership) R-value showed that leadership and sustainable project management has 80.5% correlation, while R-square value shows that 64.7% variance in sustainable project management is caused by leadership. **(Strategic Planning) H2** R-value showed correlation of 78.2% between predictor and dependent variable, while R-square value shows that 61.2% variance in sustainable project management is caused by strategic planning. **H3 (Customer Focus)** showed that the correlation is 40.6%, while variance in sustainable project management caused by customer focus is 16.5%.

H4 (Workforce Focus) R-value showed that there is a positive 54.4% correlation between workforce focus and sustainable project management. On the other hand, R-square value shows that 29.5% variance in sustainable project management caused by workforce focus. **H5 (Operation Focus)** shows that there is a 57.9% correlation between operation focus and sustainable project management. While R-square value shows that 33.5% variance in sustainable project management is caused by operation focus. **H6**

(Measurement Analysis and knowledge management) R-value showed that there is a 70.6% correlation between measurement analysis and knowledge management and sustainable project management. Table also shows that 49.8% variance in sustainable project management is caused by measurement analysis and knowledge management.

The findings of the research concluded that there lies a significant and positive impact of applying total quality management approaches to the sustainable outcomes of the projects in the UAE region. All the three aspects and pillars of SPM, economic, social, and environmental sustainability were achieved through the implementation of total quality management dimensions that include knowledge management, operation focus, workforce focus and customer focus , strategic leadership, measurement analysis and knowledge management.

Implication: The leaders and management in the public sector should give importance to the operational focus, customer focus and workforce focus in drafting project management strategies and practices. This helps brings more innovation and creativity in the project deliverables where the projects are specifically designed to benefit all the stakeholders. The leadership and project managers should also focus on the development of knowledge among the project team to gain sustainability in the project management practices.

Keywords: *Total Quality Management (TQM), sustainability, project management, public sector.*

نبذة مختصرة

مقدمة

ارتبط تنفيذ ممارسات إدارة الجودة في إدارة المشاريع بزيادة نتائج المشاريع. تمت دراسة تطبيق أدوات وتقنيات إدارة الجودة الشاملة في البحث وعلاقته بجودة الخدمات المقدمة من قبل المؤسسات العامة المتوافقة مع نتائج إدارة مستدامة للمشاريع.

الأهداف / الغايات

الغرض الرئيسي والهدف من هذه الدراسة البحثية الكمية هو التعرف على دور وتأثير إدارة الجودة الشاملة (TQM) في تحقيق إدارة مستدامة للمشاريع، تحديداً في المؤسسات العامة في دولة الإمارات العربية المتحدة.

المنهجية

لتحقيق أهداف وغايات البحث، استخدمت الدراسة تصميم بحث تبني، حيث تم أخذ المسح وقياسات المتغيرات من دراسة في جامعة كيرتن للمؤلف بي، جونغ تشيرنج لأنها كانت قابلة للمقارنة مع متغيرات بحثنا وأهدافه. اعتمد البحث نهجا كميا تجاه جمع البيانات حيث تم اختيار مصادر مختلفة من البيانات لجمع البيانات من أجل البحث. تم جمع البيانات باستخدام استطلاع ١٠٠ مشارك يعملون كمديري مشاريع، ومديري جودة، وشركاء للمشاريع، تضمن المشاركون موظفين في كل من هيئة كهرباء ومياه دبي، وهيئة الطرق والمواصلات، وجمارك دبي، وبلدية دبي. تم تحليل البيانات باستخدام برنامج SPSS وتم تحليل العوامل وتحليل الانحدار. تم إجراء ANOVA و t-test والارتباط لاختبار فرضية البحث.

النتائج وتحليل البيانات

أظهرت نتائج تحليل الارتباط أن القيادة لديها أعلى ارتباط إيجابي بنسبة ٧٨,١٪ مع الاستدامة الاقتصادية، بينما لديها أدنى ارتباط إيجابي بنسبة ٤١,٧٪ مع التركيز على العملاء. وأظهرت النتائج كذلك أن التخطيط الاستراتيجي له أقل ارتباط إيجابي بنسبة ٣٢,١٪ مع الاستدامة الاقتصادية، بينما كان أعلى ارتباط إيجابي بنسبة ٨١,٤٪ مع الاستدامة الاجتماعية. يُظهر تحليل الارتباط أيضاً أن تركيز العملاء لديه أدنى ارتباط إيجابي بنسبة ٢٤,٣٪ مع الاستدامة الاقتصادية؛ ومع ذلك، لديها أعلى ارتباط إيجابي بنسبة ٤١,٧٪ مع القيادة. وبالمثل، فإن تحليل القياس وإدارة المعرفة ليهما أقل ارتباط إيجابي بنسبة ٢٩,١٪ مع التركيز على العملاء، في حين أن لديها أعلى ارتباط بنسبة ٧٢٪ مع

التخطيط الاستراتيجي. التركيز على القوى العاملة لديه أقل ارتباط إيجابي بنسبة ٣٠,٤٪ مع الاستدامة الاجتماعية، في حين أن لديه ٦٤,٥٪ ارتباط إيجابي بالتركيز على العمليات.

أظهرت قيمة الفرضية الأولى (القيادة) أن القيادة وإدارة المشاريع المستدامة لها ارتباط بنسبة ٨٠,٥٪، بينما تظهر قيمة التباين بنسبة ٦٤,٧٪ في إدارة المشاريع المستدامة ناتج عن القيادة. أظهرت الفرضية الثانية (التخطيط الاستراتيجي) ارتباطاً بنسبة ٧٨,٢٪ بين المتنبئ والمتغير التابع، بينما يظهر التباين بنسبة ٦١,٢٪ في الإدارة المستدامة للمشاريع ناتج عن التخطيط الاستراتيجي. أظهرت الفرضية الثالثة (التركيز على العملاء) أن الارتباط هو ٦٠,٤٪، بينما الاختلاف في إدارة المشاريع المستدامة الناجم عن التركيز على العملاء هو ١٦,٥٪.

أظهرت الفرضية الرابعة (التركيز على القوى العاملة) أن هناك علاقة إيجابية بنسبة ٥٤,٤٪ بين تركيز القوى العاملة وإدارة المشاريع المستدامة. من ناحية أخرى تظهر قيمة التباين بنسبة ٢٩,٥٪ في الإدارة المستدامة للمشاريع ناتج عن تركيز القوى العاملة. أوضحت الفرضية الخامسة (التركيز على العمليات) أن هناك ارتباطاً بنسبة ٥٧,٩٪ بين تركيز التشغيل وإدارة المشاريع المستدامة. بينما تظهر قيمة التباين بنسبة ٣٣,٥٪ في إدارة المشاريع المستدامة ناتج عن التركيز على التشغيل. أظهرت قيمة الفرضية الأخيرة (تحليل القياس، إدارة المعرفة) أن هناك علاقة ارتباط بنسبة ٧٠,٦٪ بين الفرضية وإدارة المشاريع المستدامة، أيضاً أوضح التباين بنسبة ٤٩,٨٪ في إدارة المشاريع المستدامة ناتج عن تحليل القياس وإدارة المعرفة.

لخصت نتائج البحث إلى وجود تأثير كبير وإيجابي لتطبيق مناهج إدارة الجودة الشاملة للوصول إلى إدارة مستدامة للمشاريع في منطقة الإمارات العربية المتحدة. تم تحقيق جميع الجوانب والركائز الثلاثة للاستدامة الاقتصادية والاجتماعية والبيئية من خلال تنفيذ أبعاد إدارة الجودة الشاملة التي تشمل إدارة المعرفة والتركيز على العمليات والتركيز على القوى العاملة والتركيز على العملاء والقيادة الاستراتيجية وتحليل القياس وإدارة المعرفة.

التضمين

يجب على القادة والإدارة في القطاع العام إعطاء أهمية للتركيز التشغيلي والتركيز على العملاء وتركيز القوى العاملة في صياغة استراتيجيات وممارسات إدارة المشروع. يساعد هذا في جلب المزيد من الابتكار والإبداع في مخرجات المشروع حيث يتم تصميم المشاريع خصيصاً لإفادة جميع أصحاب المصلحة. يجب أن يركز مديرو القيادة والمشاريع أيضاً على تطوير المعرفة بين فريق المشروع لتحقيق الاستدامة في ممارسات إدارة المشروع.

المفردات الأساسية: إدارة الجودة الشاملة، الاستدامة، إدارة المشاريع، القطاع العام.

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Chapter 1: Introduction

1.1 Introduction

The progress of an organization and its projects are highly dependent on the extent it invests in its quality dimensions like performance of the final product, its reliability, services, durability, and its attributes offered to customers (Akanmu, Hassan and Bahaudin, 2020). In contemporary organizations, it is integral to offer quality products and services to consumers so that organizations can offer long term sustainable performance in the market with dedication and conformance. In specific to those firms that are primarily focusing on project-based business model are needed to conform their business standards to quality assurance and have a quality products and services that are satisfying for their stakeholders and fulfill their needs (Al Shehhi and Azam, 2019).

According to Akanmu and Mohamad (2021), quality management is one of the most crucial areas in projects that help firms attain sustainable development. There are some more studies that have evaluated the degree, projects face sustainability issues and must be enacted considering quality dimensions. For this purpose, a framework was proposed by Akanmu, Hassan and Bahaudin (2020) who stated that there are specific principles of Total quality management that must be ensured in projects and maintains their sustainability aspect in all external entities and markets. The main idea or methodology of the TQM primarily relies on processes followed in projects and the values offered to its stakeholders.

The main purpose and concertation of this quantitative research study is to recognize the role and the impact of total quality management (TQM) in attaining a sustainable project management across the public organizations in the UAE. As showcased in the literature review, the research is carried out on related topics that specifically show why TQM is important in successful completion of projects in contemporary world and the extent, social, economic, and environmental aspects of project is determined at the time of quality assurance. Furthermore, the purpose of this study is to offer a theoretical knowledge on what encourages public service organizations to adopt TQM principles and lead them to successful implementation of sustainable project management. The study included all those project managers and quality assurance head who have been the part of project management in public service organizations firms for more than five years, including men and women so that gender diversity aspect is also ensured, and the data is rich with quality information. This study has used constructivist approach to grounded theory and use Likert scale survey and questionnaires with project managers and quality assurance members of the public service organizations firms in the UAE. surveying such respondents has offered quality insights to the given phenomenon about the current level of TQM practices and how beneficial is to attain sustainable project management.

1.2 Background

Many concerns have been raised by scholars due to structural failure of public service organizations, be it a physical failure or progressive failure that shows viable signs of weaknesses in projects (Akanmu and Mohamad, 2021). A study by Akanmu, Hassan and Bahaudin (2020) concluded that when there is inadequate focus on the total quality

management principles like improper planning in the time of planning a project, reinforcement and fulfilling project specifications, weak materials and resources and use of unskilled professionals with inadequate management and team who is liable for managing quality. All these aspects result in structural failure of a project. On the contrary, research by Akpan et al (2014) found that when there is effective implementation of strategies for project management, it results in total quality assurance and achieve progressive growth. Jasiński and Żabiński (2021) reported in a recent survey that the high cost of initiating a new project is the main element to this sluggish growth of public service organizations, as compared to private firms. It was also affirmed by Permana, A., Purba and Rizkiyah (2021) improper planning with weak leadership skills are two contributing factors that hinders successful attainment of projects. Based on the current research, this study appraises TQM execution in the public service organizations of the UAE, with a perspective to mitigate these challenges of structural failure and will help attain sustainable project management process. Moreover, as per Al Shehhi and Azam, (2019), the debatable aspect of the absence of TQM principles and the assurance of sustainability has reached to its apex in the public service organizations because as mentioned by AlShehail, Khan and Ajmal, (2021) it is mostly perceived from the dimension of poor-quality output when it is compared with other private sector organizations. Research conducted by Bahadorestani, Naderpajouh and Sadiq (2020) showed that the final product in public service organizations firms is yearning for improvement with the help of their TQM principles; however, it seems lacking in continuous improvement with the help of leadership, teamwork, total involvement of management and rewards offered to its personnel. Inadequate resources and poor-quality process will negatively affect the project success and the final product is adversely affected.

Regarding this, Craddock (2013) and Cruz-Villazon et al (2019) proposed that further studies should be conducted for strict adherence of TQM concept in the project management process across the organizations, especially in the public service organizations for better improvement of products and services delivered to stakeholders, and the managing organizations.

Empirical studies exhibit an application of sustainable project management and its contribution in creating value, excellence of project and its operational efficacy and long-term sustainability of project in different sectors (Egwunatum et al 2019). Thus, in this study, researchers are motivated to illustrate the extent to which knowledge of the TQM concept and significance of sustainability and existing sustainable solutions are found in the public service organizations and if there is any disparities in public service organizations as compared to private industry. Beginning from this assumption that projects are regulated by using a particular methodology, the authors have also examined the use of various methods and their quality assurance in public service organizations firms in which sustainability is more showcased. This is also linked with the further research if projects managed using various TQM principles offer better results and initiate sustainability project management dimensions or not. The key aim of the authors of this study is to determine, if there is any disparity regarding the significance of specific information and knowledge areas of managing projects in the public service organizations and is so, which aspects are more important as this is essential for project managers. In the given study, the authors have also identified the knowledge and skills needed for a project manager about TQM principles that will allow managers to manage their projects in a more sustainable way. The researchers

also tend to explore the trend of relating sustainability with TQM principles and point to the solid influence of triple bottom line approach on project management.

1.3 Problem statement

Despite that the current TQM implementation in project management process is strengthened as there are cultural and legal requirements in the successful implementation of project, effective implementation of triple bottom-line across project management have been a key barrier in public service organizations firms (Gunaydin and Oraz, 2015). If the project management process is immediately experienced with a context that has innumerable barriers, the system that propels TQM principles of such projects is likely to fail (Iyer, 2018). Challenges related to the successful implementation of TQM principles have been a constant challenge for project managers in the public service organizations in contemporary landscape. To understand how to encourage project managers to remain focused on TQM principles to enhance sustainability in project management can bring different problems for existing organizations and managers in the project management because there is no adequate research carried out that have suggested solutions on how to avoid weak quality assurance activities in firms (Mir and Pinnington, 2014). Several studies show that once project managers start their project life cycle, challenges and hindrance in the current marketplace are some of the main reasons of why managers do not remain focused on triple bottom-line approach (Iyer, 2020). Generally, the issues faced by project managers in the pertinent organizations lead them to face many barriers. Such barriers can be inadequate resources and funding, fear amongst managers to bring changes, and

inefficient support of managers towards implementing TQM (Pelantová and Šlaichová, 2017).

From empirical studies, it is identified that a knowledge gap exists in what is the role of TQM in attaining sustainable project management methodologies in the UAE. There are some publications that provide preventive solutions to inefficient TQM and sustainability in the private sector firms but not across the public organizations. Hence, this study identifies that further research is required to understand the role and the impact of the TQM and address its principles to ensure sustainability in the projects management process. This is also identified that inadequate policies for the projects executed by the companies also show how public service organizations companies lack guidelines in executing their policies and require robust strategies to include sustainability policies and ascertain certain values and advantages for the project members to perform well (Pelantová and Šlaichová, 2017).

1.4 Research aims and questions

Based on the knowledge gap and the key focus and target of this study, this study aims to investigate and examine the role of TQM in successful sustainable project management achievement in the public service organizations of the UAE. To address mentioned aim, following questions will be answered by the end of the study using quantitative research methodology.

1. What is the role of TQM performance on sustainable project management in public service organizations in the UAE?

2. What are different principles of TQM that promote sustainable project management process in public service organizations of the UAE?
3. What are different challenges faced by project managers that hinder their successful implementation of TQM in project management in public service organizations in UAE?

The above-mentioned questions are addressed by the end of the study and following objectives are attained.

- To determine the current level of TQM implementation in public service organizations
- To determine the barriers of TQM implementation in the current practices in the public service organizations
- To assess the current level of TQM impact on sustainable project management in public service organizations

1.5 Operational definitions

The main operational definitions of the most used key terms in this study are mentioned below in the table 1.1

Key terms	Authors	Definitions
TQM (Total Quality Management)	(Alias et al., 2014)	Total Quality management is explained as the organizational wide quality control that also exhibits an integrated approach to attain and sustain high-quality outputs that

		include sustainability at all levels of the firm
Sustainability	Sverdrup and Svensson (2002)	It is described as meeting the requirements of stakeholders without jeopardizing future generations' ability to meet their own needs.
SPM (Sustainable Project Management)	Silvius, SChIPPER, and Planko, 2012	It is defined as the process of planning, monitoring, and regulating project operations with the goal of maximizing stakeholder benefits in the environmental, economic, and social elements of the project life cycle.

1.6 Significance of the study

The summary of the previous literature on using TQM principles in sustainable project management is extendedly fragmented and many studies have not carried out the impact of TQM activities in the successful sustainable project management process. There are very few studies in the TQM literature that have linked this concept to sustainable project management and their researchers have reviewed TQM principles and their advantages and disadvantages about private sector organizations.

The key aim of this study is to understand all those variables that contribute to the success of TQM implementation in sustainable project management and recognize the key

trends of research and identify gaps in the real-life public service organizations of the UAE (Saleh and Karia, 2020). Hence, as empirical literature does not find any place in the public service organizations industry of the UAE for the implementation of TQM; therefore, an outcome of this study will be helpful in the public service organizations of UAE.

The major roadblocks to achieving holistic TQM execution will be identified, allowing government organizations and other key stakeholders in the government sector to devise strategies to overcome these roadblocks, improve project management performance, and reduce project management process structural failures.

The regulatory agencies are equally benefitted in the context of monitoring and ascertaining compliance for public service organizations firms. This study's findings will also contribute to the theoretical literature on TQM. Despite that many organizations are focusing on TQM implementation in the project management process, failure of compliance with TQM principles is still absent and organizations report inappropriate practice of sustainability in the project management process. As a result, this study proposes a theoretical approach in the context of TQM for minimizing the failure of quality standards in sustainable project management processes in public sector organizations.

1.7 Expected results

The anticipated results of this study are to examine the role of total quality management in project sustainability in government sector of the UAE. It is argued that those project managers who have ensured the aspect of total quality management are likely to have better results for their products and services and provide sustainable project management process. If sustainability aspect is ensured in projects, they are most likely to

provide fruitful results to its stakeholders and enhance their satisfaction. In the given study, there is a factor that total quality management can be achieved by its principles and aligning them with triple bottom-line will offer sustainability to its stakeholders.

1.8 Structure of the thesis

Given a detailed analysis of the literature review and background of the study carried out in this chapter, The following is how the entire thesis is organized. The first chapter introduces the topic, its problem statement, background of the issue and the objectives of the study. It is also followed by research questions and significance of the study. Finally, expected results and structure of the thesis is mentioned that will help structure this whole thesis. The chapter 2 is about literature review and the gaps identified in previous studies are concluded in that chapter. Chapter 3 is about research methodology that explains the research approach, research design and data collection process, as well as data collection and sample size justification. Chapter 4 is about the analysis of data collected through quantitative research methodology as well as analysis discussion finally, chapter 5 is carried out to discuss findings of the study and link them with previous studies to identify research trends and future research prospects based on additional insights gained through this study, it will also identify limitations, future work, recommendations and it will conclude the whole study.

Chapter 2: Literature review

2.1 Introduction

This chapter has a core focus on reviewing the concept of total quality management (TQM) and sustainability in project management or sustainable project management (SPM) with emphasis on values, procedures, instruments, tools and shows a tentative proposal for an integrated project management system in contemporary organizations. This study draws on the theories from the field of TQM and SPM, and both are about enhancing the performance with the variations that TQM is fundamentally placing on the customer in focus; whereas SPM is more focused on a wider stakeholder viewpoint that emphasize ecological and societal problems. The concepts are reviewed in this chapter, and important values are highlighted to identify gaps in literature and tools needed for integrated sustainable project management.

2.2 Background on Total Quality Management and project management

The emergence of Total quality management (TQM) can be observed with assessment, inspecting, and continuing with quality control, quality assurance, and then to total quality management, as mentioned by Craddoc (2013) and Morfaw (2009). But opposite to this, another framework was proposed by Pelantová and Šlaichová (2017), who mentioned that adherence should be given to quality assurance and to the continuous improvement school. Nowadays, the concept of TQM is seen in parallel to the quality assurance path, as mentioned by Idris and Zairi (2006) in dual-path development. This quality assurance or TQM is seen in accordance with the ISO 14000 standards (International standard organization) by illustrating 8 management principles like continuous improvement, focus on customers, system approach to management, and process approach, under ISO 9000

(García-Alcaraz *et al.*, 2019). The current version of TQM brings ISO 9000 closer to the values of TQM, and there are indications of a junction in quality thinking. These days, the quality issue is seen as the most important aspect of organizational activity. TQM is regarded as the organizational system in which values, methodologies, and tools are considered to attain quality assurance. It is further regarded by Marcelino-Sádaba *et al.*, (2015) that TQM is an integrated management system that offers the liberty to define the type of elements included as the content of the TQM in a specific organization/project. In this study, TQM is explained as a persistent attempt to ensure the attainment of customer satisfaction and expectations at a low cost through persistent work in which all those who are a part of it are committed and focused on the organizational process. Now, as the focus is extended from customers to stakeholders, the concern is also increased. In ISO 9000, the interested word person is used to showcase those who have an interest in the organizational or project success, and the examples are customers, suppliers, unions, employees, and society as a whole (Yunis, Jung and Chen, 2013). Furthermore, the concept of TQM is applied in project management by including its project level and organizational level viewpoint and enhances the quality process of the project initiated to sustain persistent organizational improvement and its processes and capabilities (Metaxas and Koulouriotis, 2014)

Since the 1970s, persistent determination has been observed in organizational sustainability in almost all dimensions (Meadows and Randers, 2012; Yunis, Jung and Chen, 2013). As per Iyer (2018, p.22), in the theory of sustainability concept, organizations should create ways that help them decrease their negative ecological and societal influences and attain a standard of excellence that improves their economic value. In the contemporary era, it is very difficult to think about economic growth without considering the aspects of

environmental protection and combined benefits offered to society. As per Wreder, Gustavsson and Klefsjö, (2008), when an organization focuses on sustainability, it enhances organizational reputation, aggravates brand equity, improves risk management, and has higher access to capital. Hence, nowadays, organizations are now interested in including sustainability in their daily practices (Lau, Tang, and Li, 2015) and linking them with the firm objectives (Thomas and Mullaly, 2007). A recent study by IBM shows that around 52% of organizations are now redesigning their business models by considering the concept of sustainability, treating this as an emerging concept of innovation and a new prospect for reducing costs and a new framework for increasing organizational competitive advantage (Pelantová and Šlaichová, 2017). 93% of the organizational Chief Executive Officers have declared their initiatives towards sustainability that is important for their progress; thus, organizations must determine that moving towards sustainability needs radical changes of organizations towards total quality management in their dimensions. Out of the most significant organizational activities that can facilitate organizations attain such changes is the establishment of new projects regulated by sustainability principles. As per Gunaydin and Oraz, (2015), projects are the most important tools for change management in the organization that can enhance the tie between organizational strategies and its sustainable initiatives. Therefore Okland (2015) stated that organizations could incorporate organizational change towards sustainability by including it as an essential element in the project management of the firm. Silvius *et al* (2010) argued that as projects form around one-third of the global gross domestic product, the likely impact of including sustainability in project management or sustainable project management (SPM) exceeds individual imaginations and that this provision is important for a sustainable future. In the same vein,

other authors also stated that there is a need for sustainable project management because projects include various resources and have daily interaction with their surroundings. Therefore, projects are determined as the most important tools for attaining organizational sustainability (Martens and De Carvalho, 2014; Martens and Carvalho, 2016b; Huemann and Silvius, 2017). Hence, it is correct that sustainability and project management has close integration with each other (Silvius, 2012; Aarseth *et al.*, 2017). As mentioned by the World Congress of the International Project management association in 2008, the project management should accept the responsibility of sustainability. It means that the linkage between the two is established on the core argument presented by scholars (Silvius and Schipper, 2014) that is to attain a change in the organization. In the crux, sustainability is linked with getting desired changes, and project management are about the process that may help in attaining that change progressively. However, order to include sustainability in project management is not an easy process because the decisions must be carefully taken and consider viewpoints of multi-stakeholders. As per Mishra, Dangayach, and Mittal, (2011), sustainable project management balances organizational social, ecological, and economic dimensions, and by considering these three aspects, project managers are loaded with a multitude of activities and forces exerted from stakeholders like ecological agencies, customers, employees, government agencies, etc. Such forces must be considered together with the desire to offer an assurance of return on investment and long-term success. Thus, there are different tools and instruments required by companies that facilitate them to include sustainability in the organization (Martens and Carvalho, 2017).

Various important frameworks are available in the literature, as the sustainability reporting guidelines by the Global Reporting Initiatives and the indicators of sustainable

development by the United Nations Commission on Sustainable Development. Such frameworks are created based on a set of sustainable development indicators and must be utilized for sustainable business activities (Akpaet *et al.*, 2014; Mishra, Dangayach and Mittal, 2011). This involves an exclusive set of elements linked with the triple bottom line and enables firms to assess the sustainability elements of various projects and policies along with their monitoring activities (Silviouset *al.* 2013, p.5). In the same manner, emphasizing the triple bottom line dimensions like financial dimensions, people, and ethical aspects and establishing relevant indicators is used by various scholars to operationalize sustainability and include them into the project management (Misopouloset *al.*, 2018; Woźniak, 2021). As per Woźniak, (2021), it may seem the easiest and the most effective way to perform sustainable project management. Kumar and Katoch (2014) also concluded that by making use of this approach, the inclusion of sustainability in the project management would be very feasible and efficient. In this regard, empirical studies show that there are two standpoints on the inclusion of sustainability in project management. One is projected to process sustainability, and one projects product sustainability. This project process sustainability is about the sustainability of the process included in the project and its related activities like its support and delivery process. On the other hand, project product sustainability is about the sustainability of the deliverables that are constituted in the life cycle of the project. Such standpoints are well-matched with the description of project sustainability management, explained by scholars as; "the planning, monitoring and the regulating of project delivery and its support activities with key consideration on the ecological, economic and social dimensions of the life cycle of the project assets, its process and deliverables and impacts

that are targeted to realize advantages for stakeholders and carry out this whole process in a fair and ethical manner that involves the participation of stakeholders (Woźniak, 2021).

The last decade has showcased a specific interest in sustainable project management in the literature (Akanmu and Mohamad, 2021), and growing attention has been given to this area by several scholars. In this way, a base has been created in the literature to support a paradigm shift in managing projects, like mentioned by Akanmu and Mohamad, (2021) and Saleh and Karia (2020), who stated that sustainability should be determined as a new school of thought for project management. Kumar and Katoch (2014) suggested that the identification of project management as a new school is created on the following three aspects: content, society, and influence. The criteria for content are having a mutually shared viewpoint and vision/goals of the project and having a common method and tools for carrying out the project. The societal criteria are established on the following premise that there is considerable data available on it and previously published by scholars and presence of events. Lastly, the influence criteria are established when integration in the activities and standards are mentioned. This is concluded by Kumar and Katoch (2014) that given all these criteria, sustainability is practiced as a new school of thought in project management.

2.3 Sustainability in project management

In the light of current emerging uncertainties and scarce natural resources, businesses are continuously striving to attain their long-term profitable business life by addressing sustainability issues. In the context of project management, sustainability has been identified by scholars as one of the most important aspects; however, experts argue that there is very limited work done, and a very limited focus on the application of sustainability in project

management is provided. A study by Cruz-Villazon *et al* (2019) found that sustainability ascertains and includes the financial, social, and ecological liabilities and helps businesses to harness its resources that offer them resources wisely and facilitate coming generations. A few researchers have attempted to integrate sustainability with project management, like Saleh and Karia (2020). Therefore, literature exhibits models, tools, methodologies, and instruments to measure sustainability and project management. Such methods are used by organizations to assure their sustainability at the project level in the organization. Gunaydin and Oraz, (2015) found that the project stakeholders should evaluate their preferences once they analyze the impact of the project life cycle that is under process on the sustainability aspect of the projects. To analyze the sustainability aspect of a project, there are certain critical factors that help in measuring sustainability and have a key role for all the stakeholders at the time of taking decisions whilst managing projects. Al Shehhi and Azam (2019) proposed some conceptual and theoretical problems that can be faced by stakeholders in sustainable project management and are yet to be addressed by scholars. Some scholars argue that to ensure the sustainability aspect of projects, green concepts should be incorporated that is related to the continuous process enhancements of the project life cycle; however, others argue that literature on the sustainability aspect of project management is lacking to its ecological impact and its green concepts and needs to be addressed (Nwakanma *et al.*, 2014).

The literature on sustainability in projects shows that majority of studies have focused on sustainability in their projects using the concept, “triple bottom-line” (Nwakanma *et al.*, 2014). However, others have focused on their green projects and largely presented their work using a combination of financial and ecological aspects. But the research work in public

institutions or government organizations is mainly focused on the social aspects of projects. An empirical study was conducted by Martens and Carvalho (2017), who carried out a quantitative study on the Brazilian market and used a triple-bottom-line approach to understand the strategy and viewpoint of the project managers towards their project sustainability. A gap was found by authors that needed to fill the development of universally accepted sustainability parameters that must be used by the project managers to estimate and measure the likely sustainability in their projects. This can offer future avenues to researchers to include sustainability in project management and ascertain the orientation of sustainability in various phases of the project life cycle. The focus of sustainability in the project life cycle has some constraints in a way that most researchers evaluate the deliverable for sustainability, but it is estimated that not only the final deliverable, but the final product and project life cycle should be considered to attain the goal of sustainability.

A study by Kuei and Lu (2013) found that the region of the project is considered important in evaluating the sustainability of projects. Nowadays, since every individual, organization, and public institute is highly sensitive towards their profits and losses, it has become essential to illustrate and evaluate the sustainability influence at the national, local, and international levels. To meet the global standards, it is observed by scholars that projects should be related to the global supply of products and resources that are found at different places, both nationally and internationally. Therefore, from the perspective of different scholars, it is essential to consider the level of the project and identify if the project is carried out at the local, national, or international level. Literature shows that there is a dearth of studies that have emphasized the inclusion of sustainability in various phases of projects; instead, they are mostly focused on the implication of sustainability on the final

product/deliverable (Metaxas and Koulouriotis, 2014). This is also identified that inadequate policies for the projects executed by the companies also show how a company lacks guidelines in executing its policies and taking decisions on its day-to-day problems. Nonetheless, attaining sustainability in project management is an important task that also ascertains certain values and advantages for the organization to perform well. Hence, further research in identified areas could gauge improved project deliverables; however, there is a need for adequate consideration of sustainability policies and procedures along with the mutual arrangement of project stakeholders.

2.4. Total quality management

Total quality management (TQM) was primarily introduced in the early 1900s that explained inspection of assuring the quality of the products. Later in the 1930s, statistical evaluation and control of quality were provided by Walter Shewhart and made massive contributions to quality management methods (Sweis and Jaradat, 2021). He explained various methods for quality diffusion, which was later expanded by Joseph, who initiated the concept of monitoring and controlling the quality of products through managerial breakthroughs. Since the 1960s, quality management has been seen as the organizational wide quality control that also exhibits an integrated approach to attain and sustain high-quality outputs that include sustainability at all levels of the firm (Alias *et al.*, 2014). Using this perspective, quality management is further explained by scholars as to the wide organizational practices that have the key aim to offer high-quality products to customers. From a project management viewpoint, some scholars argue that total quality should be viewed from an International Organization for Standardization (ISO) viewpoint that was

previously initiated in the year 1987 and included 163 members countries. This organization offers ISO 9000 as the standard to maintain standards for quality management and offers guidelines to firms and ascertains the quality of their products and services. Furthermore, the ISO 9001 (2015) is also dependent on seven principles that ensure the quality of projects, i.e., customer-focused, leadership, people engagement, process approach, enhancement, evidence-based decision-making process, and relationship management. This specific framework ISO9001 allows the firm to follow the Plan, Do, and Check and Action cycle (See figure 1) (Sweis and Jaradat, 2021)

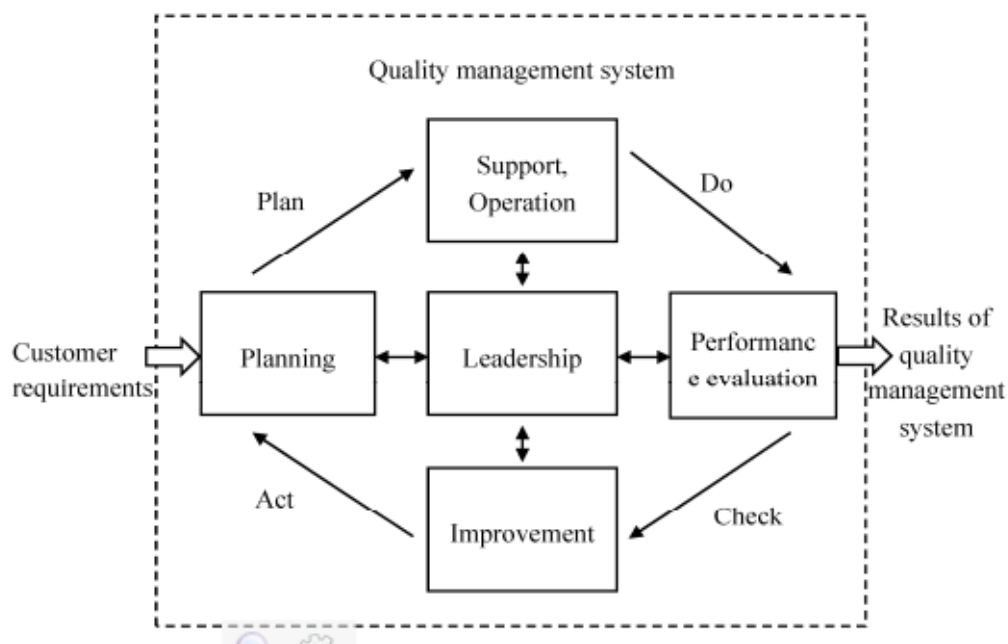


Figure 1: Framework of ISO 9001:2015 standards (Source: Quality management system—Requirements ISO 9001)

Source: Sweis and Jaradat, 2021

Gunaydin and Oraz, (2015) have a significant contribution in this area who also affirmed the validity of important eight critical factors that are needed for quality assurance i.e., the role of the quality department, the managerial activities and leadership, quality policy, training provided, service and product design, quality of suppliers and process management, data and reporting and the relationship of employees. In the year 1997, Flynn, Schroeder, and Sakakibara assessed measurement tools for managing quality in the manufacturing sector of the US. The authors found that organizational core quality principles evolved around these eight key dimensions and have a considerable impact on the organizational quality management activities and its competitive edge (Terouhid and Ries, 2016). Other scholars, Bahadorestani, Naderpajouh, and Sadiq (2020), also provided 14 points of Deming, and through Deming management methodology, seven key principles of quality management should be ensured i.e., visionary leadership, collaboration both internally and externally, learning process, process management, persistent enhancement, and employee fulfillment and customer satisfaction. These are widely accepted principles provided by different scholars to validate the constructs for quality management in contemporary organizations. Following that, there are various studies conducted to assess quality management activities and assess their execution in the organization in different countries like Japan, the US, Australia, Singapore, China, Taiwan, etc., following these pioneers of quality management. A gap is identified in the literature that there is a dearth of studies on internal quality management across functional activities of firms that focuses on process management and final design of products, issues related to products, and continuous enhancement. It is also identified by Ugo (2017) that further studies are needed to identify internal quality management activities across different project life cycles like managerial

activities inclined towards projects/products and services, training and development of employees provided for quality assurance, and problem-solving tactics needed for continuous improvement. This seems that extended research is needed to add in the widely accepted constructs previously provided by scholars for ensuring quality management activities across the projects.

2.5 Research on total quality management and sustainability project management

Various scholars have examined and included their operational areas of interest with sustainability goals in projects. Quality management has been one of the most important areas that help projects attain sustainable development. Some studies have evaluated the extent to sustainability issues should have been addressed by quality principles; however, Akanmu, Hassan and Bahaudin (2020) proposed a conceptual framework that showcased quality management driven principles and combined quality management principles with sustainability management in projects. Their study concluded that the synergy between the two areas is based on certain values and methodologies. For example, the concept of TQM focuses on processes and system viewpoints and the values offered to stakeholders; whereas. Sustainability ascertains accountability and sustainability across the triple-bottom-line that describes quality for the whole project.

Literature showed that most scholars have focused on a single dimension of sustainable activities in the field of quality management and sustainable project management, i.e., their economic aspect. As per Vora (2013), the link between quality management activities and the financial performance of the project is previously affirmed. A study by Mir and Pennington (2014) was conducted on the organizational performance, economic

performance of the project, and quality activities and found a positive impact of quality performance on the whole project's economic productivity and organizational performance. In terms of the ecological aspect, some studies have been conducted to examine the role of quality management on the project's ecological performance. Empirical studies showed that firms following ISO 9001, when combined with ecological management system ISO 14001, attain projects higher advantages than those that have not implemented these international standards on quality (Mendez and Vila-Alonso, 2018). Additional to this, the role of lean manufacturing is also showcased through empirical studies and has significant contribution in the literature stating that the ecological impact of projects has been previously demonstrated by scholars; however, from the social aspect, various studies have examined the linkage of quality management and its impact on stakeholder-advantages like customer support and customer satisfaction. But this is further criticized by Pelantová, and Šlaichová (2017), who concluded that such studies have majorly focused on employee relationships with customers and general community benefits are neglected.

There are some empirical studies that have been conducted on approaches for quality management in sustainable project management like Toyota production system, lean management, and quality deployment function (Pelantová and Šlaichová, 2017). These approaches are used to ensure the element of quality management in different projects initiated by companies. But, when Saleh and Karia (2020) compared the triple-bottom-line principles with their practical implementation in the US automobile sector, it was identified that their companies have majorly focused on the economic aspect of processes and increased their project ability by cutting cost; however, social aspects were not wholly ensured. Empirical evidence was carried out by Cruz-Villazon *et al* (2019), who evaluated the role of

lean manufacturing through the ISO 9000 and found that quality management is ensured by keeping their level of investment low and by considering the ecological aspect of the project deliverables. Yang *et al.*, (2011) used data from the manufacturing sector and evaluated 309 organizations to find the contribution of lean management activities to their project's impact on ecology and found a positive impact of lean management on their ecology and financial performance. In addition, the quality deployment function was also used as an ideal tool to evaluate the sustainability aspect of projects. In this regard, SC, and Kumar (2020) used the quality deployment function in designing electronic products and after getting customer desires, their findings concluded that there is a considerable impact of customer desires, sustainability tools of projects and quality management parameters. All these studies show that there is commonality between sustainability measures, total quality management and overall performance of the project under ISO 9000 and ISO 14000. AlShehail, Khan and Ajmal (2021) also added in the literature that quality management following ISO 9000 offers committed leadership and active participation of stakeholders, training and development of employees, customer focus, supplier's relationship to the successful implementation of sustainable project management. All these principles are in congruence with the aims of social dimensions of sustainable project management and ascertain advantages to internal and external stakeholders by cutting down unimportant costs and enhancing quality processes. To date, there is inadequate documentation of the contribution of total quality management activities to sustainable project management through empirical evidence has been carried out. To bridge this gap, there is a need to evaluate the role of quality management activities in three aspects of sustainable project management specific to the public sector that

has not been investigated to date, despite that the public sector has more inclination towards quality management practices for projects.

2.6 International Standards Organization for standardization in Total quality management (ISO)

In a current business context, global competitiveness has enabled companies to make an extended investment in their resources and enhance their managerial efficacy in carrying out different projects. The rise in globalization is one of the emerging reasons for the inclusion of total quality management in project sustainability and provided different standards. AlShehail, Khan and Ajmal (2021) explained that there are positive impacts of TQM standards in project sustainability and help increase productive and innovative abilities of projects by reducing imperfect information, decreasing cost, encouraging competition, and improving process management. All these advantages are regarded by scholars as not mutually exclusive; however, Pelantová and Šlaichová (2017) offered opposing viewpoints on the negative impact of TQM standards as it imposes considerable focus on innovation and decreases market competition. Although, Bastas and Liyanage (2018), in their quantitative study, concluded that the positive impact of standards had outweighed its negative influence.

Globally, there are 70 programs and awards provided to firms for enhancing their quality. Most used are Malcolm Baldrige National Quality Award, ISO 9000, ISO 14000, and Six Sigma. In most countries, companies like to know if their financial benefits linked with the ISO 9000 and ISO 14000 are higher than the cost of attaining certificates for these standards. ISO 9000 and ISO 14000 are not standards in themselves, but they are used as indicators for a range of standards. The key standards ISO 9001 and ISO 14001 are used as

the basic requirements for getting efficient quality management and environmental management system, respectively.

2.6.1 ISO 9000

ISO 9000 is the series of standards published by the ISO for the assurance of quality management standards in 1987. Scholars argue that ISO 9000 standards are adaptable in that it is updated and changed every three years to ensure their compatibility with market conditions. As per Bastas and Liyanage (2018), ISO 9000 facilitate companies to create its quality ensure system. Other scholars, Fewings and Henjewe (2019), also affirmed that such standards are not only meant to explain products/services, but they facilitate quality management in processes and can be used across production and service firms. Regarding projects, the ISO 9001 model assures that all its project life cycle activities, from idea generation to planning to final delivery, ensure quality in the project. The ISO 9002 offers quality assurance in production and its servicing, whereas ISO 9003 is only limited to inspecting and evaluating. The ISO 9004 deals with the customer interface and improves the service quality dimensions.

Studies showed that ISO 9000 facilitated firms with their internal strengths and strategic advantages that follow quality tools. As per Fewings and Henjewe (2019), the internal enhancements include all business activities that are linked with the products and must be executed in three phases: planning, control, and documenting. The ISO (2011) mentioned that an organization that attains this ISO 9000 certificate ensures that it has fulfilled customer requirements and applied its regulatory requests whilst maintaining customer satisfaction and attainment of continuous enhancement through all processes including projects management.

2.6.2 ISO 14000

ISO 14000 is another indicator of the series of ISO provided for ecological management standards, and that was created based on the progression of the international standard 9000 and in reaction to the global awareness towards ecology. As per Cruz-Villazon *et al* (2019), ISO 14000 is attained from the UK standard 7750 that included the description of ecological management and is determined fundamental for better ecology. ISO (2011) pointed out that when an organization or a project attains this certification, it means that they have enhanced the likelihood of minimizing the harmful influence of ecology that occurred from the activities of the project and offers continuous improvement in the ecology, leading to the best sustainability practices.

Literature showed that ISO 9000 and ISO 14000 have extensive similarities procedural-wise; however, they point to different aspects of an organization and projects i.e., quality, and ecological aspects of the project or organization. As per Mir and Pennington (2014), ISO 14000 counterparts the quality management system and establish a related system for the managing ecological influence of projects, yet such standards also address varying target customers. ISO 9000 tends to enhance the quality of the projects; whereas ISO 14000 points to the ecological performance of the projects and foster project manager relationship not only with market players but with non-market players like NGOs and regulatory agencies.

2.6.3 The impact of ISO 9000 and 14000 on projects and future research avenues

A study by Cruz-Villazon *et al* (2019) concluded that the key advantage of ISO 9000 is, it eliminates the probability of errors and offers an effective quality system that eventually

saves money on scrap work. Bastas and Liyanage (2018) also claimed that ISO 9000 has a major contribution to the marketing activities of firms as this standard affirms internationally identified quality aspects. As per AlShehail, Khan and Ajmal (2021), there are certain reasons why companies should implement ISO 9000 or project managers follow the implication of ISO 9000 in their projects; i) there is always pressure from customers towards the company and project efficacy; ii) to decrease the likelihood of failure; iii) to decrease the customer complaints and get things right on the right time; iv) to enhance the competitiveness and sustain contracts with current customers. SC and Kumar (2020) also highlighted the two most important implications of ISO 9000 in enhancing productivity and helping firms to reach international markets.

Many studies have placed massive focus on the ISO certification as an important marketing tool. For example, Mendez and Vila-Alons (2018) illustrated that this certification helps companies to have a better marketing approach. Although Gallotta *et al* (2016) explained that most companies, regardless of their location, have seen better efficacy as a key benefit. Haron *et al* (2017) also made the same conclusions that ISO helps in establishing improved marketing approaches. In addition, Mir and Pinnington (2014) also found that the benefits attained from certification of ISO and project success and improved organizational performance are repeatedly found and empirically investigated. Other studies show that the advantages of ISO 9000 are more than the cost of its registration; however, it is notable that ISO 9000 should not be viewed as a quick and long-term investment that needs devotion and continuous efforts. Saleh and Karia (2020) also stressed that if massive efforts are made towards the inclusion of ISO, and money and time both are invested, quality standards of

projects can be enhanced and results in repeat orders from customers and satisfied customers and better employee job satisfaction.

ISO 9000 related research articles has mainly focused on the qualitative side advantages like better communication and a better understanding of how organization works. About its quantitative benefits, there are a few studies that have been published in the literature. For example, Kirsch and Alvarez-Gil (2002) used quantitative research methodology and found that ISO 9000 certification does not essentially results in better financial performance; rather, the cost of ISO 9000 could be higher than the benefits of attaining quality certificate. However, Gunaydin and Oraz, (2015) found that the cost of ISO 9000 can be easily recovered in three years of project initiation as it helps in reducing likelihood of project errors. Kuei and Lu (2013) also indicated that this certification does not always result in financial improvement and better revenue; yet Paranitharan and Babu (2014) concluded that the project managers reporting ISO 9000 have attained economic success as their success is assured. Since ISO 9000 helps in improving accountability of business activities and project life cycle, it indicates the ability of the project to satisfy customers. Literature shows that very few studies have measured the financial aspect of implementing ISO 9000 and ISO 14000. Additionally, there are opposing viewpoints in the literature about the implication of ISO as some argue that it results in better financial results, and others find that it does not have any impact on business productivity. Fewings and Henjewe (2019) found a negative impact of ISO 9000 on organizational benefits as it increases the cost of certification, and customers' satisfaction level is also reduced because the company will attain fewer earnings and will have little money to assure quality aspects of projects/organization.

The literature review on the implication of ISO in maintaining quality standards in project management shows that the benefits of ISO 9000 and ISO 14000 outweigh its costs; yet their studies do not cover public institutes and government organizations that have a considerable role in affirming or refusing projects. Saleh and Karia (2020) called for future studies about the integration of ISO in the project management process carried out by public institutes and government reformers. Moreover, AlShehail, Khan, and Ajmal (2021) also identified that previous studies have majorly focused on the short-term frame of implementing ISO in projects; however, long-term quantitative analysis is needed to identify the impact of ISO on the project financial aspects. Moreover, companies that have followed ISO standards should be compared with companies that have not implemented so that the benefits of implementing ISO for quality assurance can be determined and clearly compared, introducing its direct and great benefits.

2.7 Sustainability in the public sector

Various studies have emphasized the execution of sustainability across different sectors. Most of these studies have focused on sustainability in private sector organizations. But in the contemporary public sector, sustainability has attained considerable attention (Walker, 2015). The likelihood of the public attaining access to sustainability is showcased considering the size and influence of the public sector regarding its share in the GDP of the nation. It is sometimes not easy to evaluate if the focus on the private sector studies has shown inadequate sustainability activities in the public sector or if the public sector is not yet researched by scholars. A very small number of studies have examined the role of public industry in the emergence of sustainability activities. In general, research on the public sector

firms and progressive execution of sustainability in project management activities in government firms limit the generalization of sustainable development in research. Experts call for extended research on public sector firms that are still lagging in the growth of sustainability initiatives. Project managers in public institutes are evidenced with facing several procedural, regulatory, and political limitations. Additionally, various internal and external stakeholders have a considerable impact on the progress of sustainability activities. Such stakeholders can have conflicting objectives. A study by Saleh and Karia (2020) concluded that the emergence of sustainability in the public sector firms should include an examination of all those factors that hinder their potential to follow and adopt sustainability measures and affect their stakeholders. This is the reason this study is an attempt to target the public sector in the United Arab Emirates because of inadequate focus given on the implementation of sustainability initiatives across the public sector.

This study views both public sector organizations that are progressively operating their activities and those that are not progressive in executing sustainability activities. Asif *et al* (2011) public organizations have wider and diverse characters, and by contacting their contractors and project managers would offer diverse viewpoints on the sustainability aspect of the project management process. In specific, the triple-bottom-line involves social fairness and economic growth. As per Iyer (2020), this is one of the most effective and powerful notions to convey what is sustainability for firms. Sustainability initiatives should be related to the organizational strategy; rather than individual projects that are independently controlled; however, when projects are contractual in nature, the problem of sustainability arises. Some scholars are of the view that sustainability should be implemented across the whole firm and make it part of the whole firm. If there is transparency in the project's social,

economic, and ecological aspects, it results in transparency that offers further linkage with the internal and external stakeholders and enhances their processes and promotes a wider base that competes for public contracts. Sertyesilisik (2014) found that most of the public sector is unable to include sustainability in their buying process, leading them to face issues in their lateral stage.

Some experts argue that the inclusion of sustainability initiatives in the organizational buying strategy requires partnership and joint value creation methodology with chosen actors in the supply chain process. In this regard, challenges can be internal, like organizational culture, employees, leadership, etc., and external, like environmental pressure. Fewings and Henjewe (2019) concluded that this is the reason indirect initiatives are needed for improving sustainability initiatives that involve the collection and distribution of sustainability-related information. Therefore, the key step is directed by scholars as to the implementation of sustainability policy with clearly mentioned goals and policies to public institutes. Literature shows that there is a dearth of studies conducted on policy execution across public organizations for implementing sustainability initiatives and requires future researchers to extend their studies and bridge this gap.

2.8 Challenges in Total Quality Management

2.8.1 Poor and ineffective managerial support

Execution of Total Quality Management (TQM) helps firms to continuously improve the quality aspects of products and services and meet dynamic customer requirements. In this changing environmental condition, organizations face intense competition and have a higher demand for high-quality products and services to their customers (Yang *et al*, 2011). Yet,

this area is not given adequate importance in the UAE that is a cause of its negative results in those organizations that are functioning on project-based contracts. As per Mendez and Vila-Alonso (2018), there is a need to follow the philosophy of TQM that identifies those obstacles and hurdles and eliminates them to ensure quality results. Previous studies show that there is a dearth of literature on identifying challenges faced by firms in the project management sector, which is a key cause of their successful integration of TQM in their sustainable projects. A study by Haronet *al* (2017) concluded that the progress of any organization depends on its effective and efficient leadership and the role played by its head/supervisor. Management and leadership are two important factors that have a considerable impact on the organizational implementation of TQM. However, when there is ineffective and poor leadership, it may hinder the progressive execution of TQM in public organizations.

2.8.2 The aspect of fear in implementing TQM

The literature on the issue suggests that in the beginning stage of TQM implementation, individuals are apprehensive of changes (e.g., Stabler, 1995). When individuals do duties in a new work setting, they become more fearful (Kolodny, 1995). It is tough to apply TQM because of the fear of losing your position, authority, or even your job (Waller and Ahire, 1996). Threat and dread are generated by the application of TQM and other management ideas like re-engineering or knowledge management (Gordon, 1995; Pastore, 2003). Attention is given to not only organizational alterations but also to the need to modify the organization's culture and eliminate any fear or anxiety that may arise from such a transition (Carmody, 1994). Fear of change is not just a consequence of dread of the

unknown and novelty, but also of uncertainty and a lack of managerial support (Jacokes, 1996; The antidote to fear-driven management, 2012).

Inevitably, new management concepts, such as Total Quality Management, induce anxiety, which may be exacerbated if the scope and effect of changes are great enough. There are two competing hypotheses in the literature on how to work safety affects a company's capacity to adopt changes. An organization's participation in guaranteeing work safety is required by "Drive out Fear" and "Drive in Fear" principles, respectively, according to this framework (Repenning, 2000). According to some studies and management consultants, the fear of losing their jobs has a beneficial impact on people's willingness to make improvements to their work environments. For instance, in Kotter (1995), Management who actively emphasize weak company outcomes and the likelihood of further losses are discussed here. Modifications and improvement procedures are implemented. Bailey (1997) argues that managers who want to make significant changes to their company should use the threat of losing their jobs as an ally. TQM, on the other hand, rejects such viewpoints since they focus only on financial outcomes while ignoring social outcomes. Second, they emphasized short-term goal-oriented motivation, which Deming opposed.

2.8.3 Strategic planning

The ISO standard specifies quality goals in clause 5.4.1, which deals with strategic planning. An important part of the paragraph reads, "top management should ensure that quality targets, including those necessary to achieve criteria for products, are defined at appropriate activities and levels within the business." To meet the quality policy, the quality goals must be quantifiable and consistent. There are four strategic thrusts in place to achieve

UUM's mission and vision: 1. academic excellence; 2. development of academic ability, personality traits, entrepreneurialism, and leadership qualities; 3. internationalization of university activities; and 4. internationalization of the university's activities. 2. academic excellence There has been some progress in establishing the university's strategic plan, but employees are unsure of how it relates to quality goals. Quality initiatives, according to previous research, should be a part of strategic planning or the organization's primary strategic planning. Garvin (1988) Quality idea should be considered as strategic quality management, which is defined from the customer's point of view, according to the author. Implementing quality initiatives is a strategic move since it incorporates the organization's strategic objectives, which are linked to the purpose of quality improvement, which is to gain a competitive advantage (Shani and Rogberg, 1994). When an organization's strategic planning is out of sync with its day-to-day operations, it may result in a quality implementation failure (Hansson and Klefsjo, 2003; Srinidhi, 1998). To address this problem, the UUM strategic thrusts and particular targets are incorporated in the ISO standard's quality handbook. For internal and external audit purposes, the quality management system's quality target is linked to UUM's strategic plan. As a result, the institution would be able to achieve its stated goals via the auditing process.

2.8.4 Ineffective leadership

Yusuf *et al.* (2007) also emphasized the need for good leadership for the successful adoption of TQM and highlighted that the influence of management leadership on an organization's workforce assures greater performance. TQM implementation is hindered by a lack of commitment from the highest levels of management. The TQM strategy is

implemented and encouraged by the highest levels of management. TQM adoption requires a change in corporate culture and environment, which cannot be achieved without an effective management and leadership team. Having a clearly defined goal and then devising a plan of action to achieve it is a hallmark of effective leadership (Yusuf *et al.*, 2007). TQM deployment can only be successful if the organization's management is effective. Employees benefit from the focus and dedication of upper-level management (Pheng and Jasmine, 2004).

2.8.5 Lack of funding and resources

Resources, employee satisfaction and requirements, training, adequate organizational culture, a conducive atmosphere, subordinates' collaboration, effective curriculum, effective planning, etc., are all variables that contribute to the successful implementation of TQM in the workplace. According to Ater (2013), resources are very helpful for implementing TQM in public organizations. For a successful deployment of TQM, it is critical to have the right people, resources, and financing. When it comes to employee happiness, Zhang (n.d.) says that actions like thanking employees and recognizing them for their contributions may help motivate them to strive toward quality improvement. Otherwise, they'll be pointless and ultimately ineffective. Improved working conditions, more enticing compensation packages, training for employees, and monetary incentives for innovative ideas are all wonderful ways to show employees how much they are appreciated. According to him, employees should be valued, and resources should be used to provide them with excellent education and training throughout their careers (Zhang, n. d). Examining the significance of employee education and training, Ater (2013) and Mann (1992) mentioned that TQM adoption relies heavily on the training and development of employees. TQM adoption may be hindered by lack of

information, lack of tools, lack of financing and inadequate leadership commitment, bad data and deployment plans, inflexibility of piecemeal implementation, excessive expectations, and insufficient management abilities, according to a variety of studies (Munro, 2008; Sergiovanni, 2001).

One of the primary causes for the failure of TQM initiatives is a lack of support from the top of the organization (Brown *et al.*, 1994). The implementation of TQM may be hindered by ineffective leadership, resistance to change, inconsistent policies, the wrong organizational structure, and inadequate management of the change process (Dale, *et al.*, 2007). Kosgei (2014) Lack of commitment by management and certain employees, organizational culture, poor documentation, insufficient staff training, and inefficient communication were all identified as problems in adopting TQM.

A research study conducted by Mobegiet *al*, (2010) in the Gucha district found that all schools lacked adequate physical, learning, and instructional tools. Hamidi and Zamanparrar (2008) looked at the issues and roadblocks to TQM implementation and found that the biggest roadblock is a lack of senior and middle management engagement. Failure reports in adopting TQM are often attributed to a lack of top management commitment. They went on to say that without managerial commitment and a supportive corporate culture, no progress can be made. Workforce training programs are critical for successful TQM adoption.

2.8.6 Insubordination of workforce and employee commitment

To implement ISO 9000 successfully and economically, a firm requires complete commitment from all employees. In a large institution like UUM, this is a significant

difficulty. Academic employees who operate in their own ways were among the first to raise concerns about ISO 9000's adoption at the institution (Yusoff and Mokhtar, 2003). Working adhering to established written methods, they said, stifles their creativity. Maintaining employee motivation to maintain the quality management system is still a difficulty for UUM. Some personnel have failed to follow processes after the ISO 9000 accreditation reached its ninth year. As a result, in July 2009, QMC convened a conference with all the departments' quality managers. The meeting's goal is to remind managers that their department's quality committee needs to be activated. This committee's responsibilities include planning and coordinating quality initiatives, as well as ensuring that all members of their department are properly educated on the university's quality management system implementation. To maintain the quality management system, it is critical for UUM to maintain and grow employee motivation. Employee participation, which is one of the tenets of comprehensive quality management, is one approach to achieve it. Employee engagement is defined as "any action in which workers participate in work-related decisions and development initiatives with the goal of accessing all employees' creative energy and increasing their enthusiasm" (Evans and Lindsay, 2002, p. 301). Employees are an asset to any company. As a result, their engagement is a vital aspect in achieving quality achievement, as the business relies on employee participation. Employee engagement may lead to "quicker, more responsive choices, continual performance gains, and better employee flexibility, dedication, and happiness," according to the company (Cummings and Worley, 1997, p. 300). UUM might take a few different techniques to involve employees. Quality circles, cross-functional teams, steering committees, and problem-solving teams, for example, are some of the tactics that many successful firms have utilized to encourage employee engagement

(Ahire and O' Shaughnessy, 1998; Curry and Kadasah, 2002). In general, cooperation may encourage employees and provide them a chance to voice their opinions and make ideas for the betterment of the company (Abdul Rahman and Tannock, 2005). In UUM, some of these actions have already been carried out, but it is necessary to keep an eye on how well they are being implemented. An organization's quality management system cannot function effectively unless its employees are aware of its primary goal. It's more than just a means to an end; it's a means to achieving organizational greatness.

2.8.7 Lack of management commitment

TQM is critical to the long-term viability of a company. TQM has long been seen as a key aspect in increasing the production and efficiency of a business (Gharakhani, *et al*, 2013). Setting a clear vision, strengthening personal mastery learning for the workforce, focusing on student-driven values, defining respectable and attainable objectives, and improving day-to-day and routine management are all critical components of TQM implementation (Herman & Herman, 1995). Commenting on TQM implementation, Toremene *et al* (2009) To achieve system-wide quality improvement and adopt TQM principles, it is necessary to develop an effective change management strategy that educates employees and makes use of human resources. Effective leadership, institutional commitment, and a clear vision are all required for successful TQM adoption. According to Wani and Mehraj (2014), The effective adoption of TQM requires long-term leadership, cooperation towards a single goal, and institutional commitment. Further, they noted that TQM has a favorable impact on organizational performance via leadership, responsibility, and teamwork. TQM may be effectively adopted, refined, well-organized, and effective if

these aspects are taken into consideration. Yusuf *et al.* (2007) also emphasized the need for good leadership for the successful adoption of TQM and highlighted that the influence of management leadership on an organization's workforce assures greater performance. TQM implementation is hindered by a lack of commitment from the highest levels of management. The TQM strategy is implemented and encouraged by the highest levels of management. TQM adoption requires a change in corporate culture and environment, which cannot be achieved without an effective management and leadership team. Having a clearly defined goal and then devising a plan of action to achieve it is a hallmark of effective leadership (Yusuf *et al.*, 2007). TQM deployment can only be successful if the organization's management is effective. Employees benefit from the focus and dedication of upper-level management (Pheng and Jasmine, 2004).

2.9 The impact of total quality management on sustainable project management

Overall, TQM techniques seem to have a beneficial impact on productivity and manufacturing performance as well as the quality of the products and services that are produced, as well as staff satisfaction and performance as well as client satisfaction and outcomes. Some researchers, on the other hand, have identified findings that are negative or inconsequential.

2.9.1 Leadership

Workers, supervisors, and customers all communicate with one another and with the company because TQM leaders see the company as a system. Employee engagement in decision-making is also encouraged by leaders who empower their workers. To be successful, TQM procedures must be supported and implemented by the company's top management.

TQM adoption and practices call on managers to take a more proactive role in raising employee knowledge of quality issues than they have in the past, Yusuf *et al.* (2007).

2.9.2 Knowledge and process management

According to Kuei and Lue Knowledge management is the process of ensuring that workers have access to the data and information they need to perform their duties successfully and efficiently at the company. Only in this fashion can TQM techniques provide the desired advantages. Through a series of scientific and behavioral actions, process management stresses activities rather than outcomes (2013). Quality management practices that are proactive and preventative in nature are part of this strategy. Knowledge and effective process management procedures analyze data on quality to successfully manage processes. Material purchases and inventory turnover may be enhanced in this manner. It's also possible to find and fix faults in the process. Controlling and monitoring quality data on a constant basis improves the processes. Knowledge and process management design may reduce the environmental impact of a company. Costs are also decreased, and profit is increased as a result of the company's procedures becoming more prevention oriented (Kuei, Lu 2013).

2.9.3 Training

According to Gunaydin and Oraz, (2015) TQM companies should ensure that all their workers get the training they need to become more proficient in their jobs. Success for businesses is a result of management training that is both efficient and focused on quality improvement. The firm's quality management will be sustained by its employees' effective knowledge and capacity to learn. Therefore, learning businesses quickly adjust to changes

and generate distinctive behavior that sets them apart from their competitors and helps them achieve superior outcomes. All employees of the company are responsible for the quality, not just those in one area or function. Based on the findings of the training needs assessment, all staff should get training.

Employees learn about the industry and the company's structure via good training. Additional benefits include increased employee loyalty and motivation as well as a higher level of productivity at work. Employees who are trained in the manufacture of high-quality goods and/or services will be more productive if they are encouraged to participate fully in the process. As a result, there will be fewer complaints and more satisfied customers.

2.9.4 Supplier quality management

TQM's approach to supply chain management includes simplifying and lowering the number of suppliers to make it easier to manage the relationships with those suppliers. Making and ensuring expectations are fulfilled, and incorporating suppliers early in the product development process to make use of their talents and knowledge.

The initial step in creating a company's goods and services begins with the inputs received from suppliers. High-quality inputs translate into high-quality outputs. Because of this, the suppliers must embrace TQM and participate in the process. Suppliers that use good supply management strategies are better equipped to implement quality control and provide timely, dependable goods and services (Yunis, Jung and Chen, 2013).

2.9.5 Customer focus

External clients are the primary emphasis of TQM companies. Prior to offering items or services, they must first learn what their clients want and need. Production may be tailored to meet the wants, requirements, and complaints of consumers with the help of effective customer focus activities. Companies are encouraged to create high-quality, dependable goods and services on time with greater efficiency and productivity because of this policy. Increasing customer satisfaction leads to higher sales and market share for the company (Yee, 2018).

2.10 Gaps in Literature and concluding remarks

Research is needed to further understand the function of Total Quality Management and its concepts in the project management process specially in public service organizations, as this study found. This research is expected to assist project managers in the public sector in enhancing their quality management processes and enable their stakeholders to reap the advantages of quality-ensured projects. There have been studies done in the past to highlight the features of sustainability in project management; however, researchers have identified a gap that needs to concentrate on the inclusion of sustainability throughout different stages of projects, rather than solely on the product/deliverable in those studies, which means throughout all the project phases to make sure having the best use of the continuous improvement methodology. We've found that projects run by the public sector lack rules for implementing their policies, which means they need solid plans that include sustainability principles and provide specific benefits for the project's participants to work properly. There is a need for more study into the highlighted problem areas, as well as a proper examination

of sustainability policies and processes, as well as a mutual arrangement of project stakeholders.

Study after study has shown that ISO standards may help assure the quality and environmental elements of projects. There is currently no quantitative research on the impact of ISO on project deliverables and life cycles, even though experts have mostly employed qualitative methodologies. It has been shown that ISO 9000 and 14001 are beneficial to project management. However, their studies do not include public institutions and government organizations that play a significant role in approving or denying projects, which is the focus on the study, as new emerging topic focusing on the public sector. Gunaydin and Oraz, (2015) advocated for further research on the integration of ISO into the project management process by public institutions and government reformers in the future. Moreover, Khan *et al* (2020) the necessity for long-term quantitative measurement of the effect of ISO implementation in projects was also noted as a problem in prior research. In addition, firms that have adopted ISO standards for quality assurance should be compared to those that have not to establish the advantages of doing so, to have a clear comparison and direct evidence of the TQM tools impact on attaining sustainable project management. TQM has been adopted in a variety of sectors, including the corporate and public sectors, by contemporary scholars. To address this deeply ingrained part of project management, there has been a noticeable movement in the sustainability of projects and organizations during the last decade. There seems to be a lack of consistency in the public sector of the United Arab Emirates when it comes to the implementation of the idea of sustainability in project management. To address the long-term viability of initiatives, this new perspective is critical. TQM's potential to improve the long-term viability of a project's management process and

provide measurable outcomes has not been well explored in the present body of research. TQM's impact on the manufacturing industry has been thoroughly studied by experts, and it's vital to note how project managers keep the sustainability factor in mind. Topics and themes discussed in this literature study are on how to keep the TQM part of project management sustainable in manufacturing and service sector firms. It is expected that this research will help bridge the gap in our understanding of what drives project managers to improve TQM and provide better services of sustainable project management.

2.11 Conceptual Framework

Public sector sustainability goals are becoming more important, and this research aims to investigate how Total Quality Management (TQM) might help public service organizations implement sustainable project management practices. TQM concepts and project management will be examined as part of this research, as well as methods in which public sector enterprises might achieve sustainability. The research also seeks to explore the importance of TQM for sustainable project management in this study as well. An instrument for collecting data from project managers and project participants working on public sector projects in the United Arab Emirates (UAE) is likely to be used in this study. Based on several criteria for comprehensive quality management in various public sector enterprises, the following conceptual framework has been developed, including 6 hypotheses.

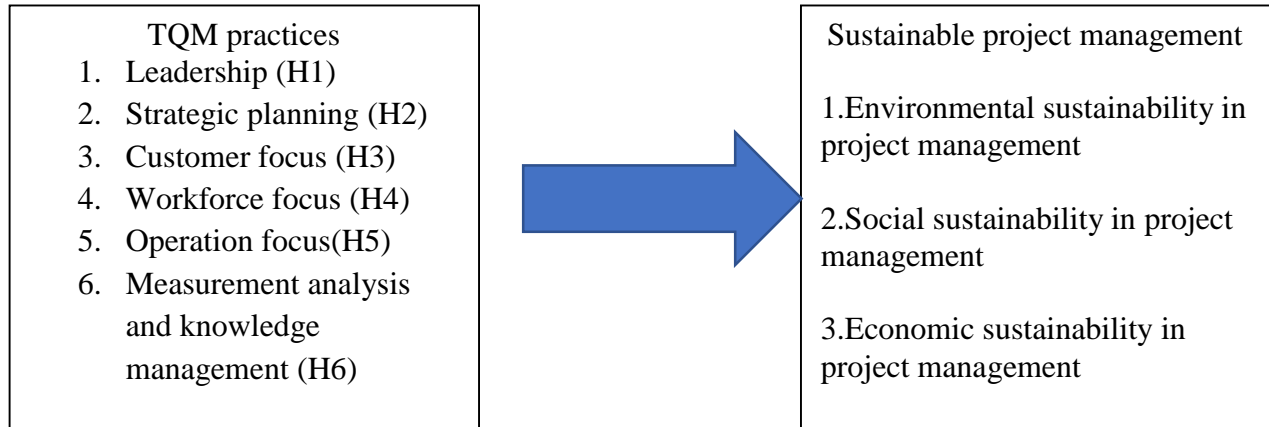


Figure 2: Conceptual framework

The above figure identifies the conceptual framework, with the main 6 hypothesis that will be tested later against the dependent variable as whole, which is Sustainable project management.

2.12 Conclusion

The literature chapter has identified the main research that will support and proof the findings of the study, as well as support answering the research questions in a good manner. the chapter has covered a detailed overview of Total quality management and project management, international standards that supports the research such as ISO9001 and ISO14000, it has identified challenges in TQM implementation, as well as the current literature and situation of TQM implementation to attain SPM, that can be further analyzed and improved at the end of the study.

Chapter 3: Research Methodology

3. Introduction

The following chapter is based on the explanation of the methodology that was adopted for the data collection, analysis and presentation of the data that was collected for the purpose of finding and achieving the objectives of the research. The chapter provides a detailed overview of the research approach adopted, the methods used for collecting data, the tools used for collecting the research data from the respondents, the sample and sampling technique along with the approaches adopted towards the data analysis for the current research.

3.1 Research Design

The research has adopted a quantitative approach towards data collection where different sources of data have been selected for gathering data for the research. (Creswell, 2009) It used a quantitative strategy that comprised both primary and secondary data gathering methods in the study. The survey is one of the key data sources. The primary data is the one that is collected directly from the respondents of the research, and the data is considered first-hand without any previously done test. The advantage of the primary data collection is that it allows the first-hand data collected that is directly from the sample of respondents on whom the research is being carried out. However, there are a few disadvantages that are related to the increased time and resources required for collecting the required data. Secondary data is also gathered from many sources, such as literature reviews, journals, research papers, books, and internet information.

3.1.1 Cross-Sectional Study

A cross-sectional study design was chosen because of the research's goals. Cross-sectional research was chosen because of its capacity to demonstrate a relationship or prevalence utilizing data and information derived from a large sample at a single period. The cross-sectional study approach is also the right approach for our research based on the large population from which the data needs to be collected and because the study does not require any examination of the trends. The study design has also been adopted based on the time constraints (Hair et al., 2012). Therefore, the research has used the cross-sectional study to find the association that exists between the TQM practices in the organization and the project performance in the public sector of the UAE region.

3.1.2 Sampling Technique

The process of sampling plays an important role in any research for determining the respondents and respondents' size for the research. The process of sampling includes defining the research population, developing the framework for the sample, and selecting the appropriate sampling method. To figure out the most efficient sample size and to choose the actual sample for the study.

3.2 Defining the population

The population for any research includes all the participants and the groups which are the subject for any research as specified by the research objectives (Delice, 2001). The target population for the current research includes all the project managers, quality managers, and project associates that are working in the public sector of UAE, specifically in the Dubai region. The sample size for the research has been determined based on the project management employees working in the public sector of UAE.

The population of the research includes the project managers, quality managers, and project associates, particularly working in DEWA, RTA, Dubai Customs, and Dubai Municipality. The following table illustrates the total population based on the project managers and quality managers working in the selected organizations for the research.

Organization	Number of Employees
DEWA <ul style="list-style-type: none"> Project Managers Quality Manager 	10 20
RTA <ul style="list-style-type: none"> Project Managers Quality Manager 	10 8
Dubai Custom <ul style="list-style-type: none"> Project Managers Quality Manager 	14 25
Dubai Municipality <ul style="list-style-type: none"> Project Managers Quality Manager 	14 20
Total	121

Source: (Labor Force Survey, 2020)

3.2.1 Sampling Method

The sampling method defines the ways in which the sample was constructed for the research. “There are mainly two types of sampling techniques that are used for developing a research sample. These include the probability sampling technique and the non-probability sampling technique. The probability sampling technique is based on the development of the sample using the statistical or mathematical probability method, where a non-probability method is one where the sample is constructed with any calculation”. (Willis, 2004)

For this study, we employed a simple sampling method in which the sample size was selected based on the ease with which respondents could be contacted. Non-probability sampling is called convenient sampling, and the sample is chosen depending on the specified criteria. The rationale for using the sampling technique was that we need to gain the prior consent of the respondents to become part of the research-based on their availability and time as each participant in the sample belongs to management positions. Another reason for selecting the technique for sampling was that it allowed each participant in the population an equal chance to become part of the sample. It is also less time-consuming. Therefore, the method was selected based on the time constraints for the research.

3.2.2 Sample Size

The sample size for the research includes the total number of respondents from the population who would participate in the data collection for the given research. The sample

size, based on the convenience sampling technique, for the given research includes 100 respondents based on the sampling calculations provided by Taro Yamane (1967). As per the calculations, the sample size came out to be 92.9 which we have rounded off to 100 as it is most appropriate sample size for the current research. These respondents would be the project managers, and quality managers who are working in the public sector organizations in Dubai, UAE. These include DEWA, RTA, Dubai Customs and Dubai Municipality. Each of these participants would be provided with a consent form to ensure their willingness to participate for the given research on the association between the TQM practices and project management quality in the UAE region. The justification of the sample size is based on the formula referred by Taro Yamane (1967) which has been specifically designed to gain the exact number of sampling size. The following table provides the calculation for the sample size for the given research.

$$n = N \div [1 + N (e)^2]$$

$$n = 121 / [1 + 121(0.05)^2]$$

$$n = 121 / [1.302]$$

$$n = 92.9$$

The sampling justification is also based on Krejcie and Morgan table, which was proposed in 1970. The table is as under:

Table 3.1									
<i>Table for Determining Sample Size of a Known Population</i>									
N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	100000	384
<i>Note: N is Population Size; S is Sample Size</i>					<i>Source: Krejcie & Morgan, 1970</i>				

Considering the above table, as our population is 121 employees, the sample size as per the table should be 92 employees. Therefore, choosing 100 as our sample size is justified based on both the sampling techniques.

3.2.3 Instrument for Data collection

The research data collection tool for the given research includes the survey questionnaire. For the data collection, a structured survey questionnaire was developed, which was carefully designed based on the objectives of our research. Sections A and B of the survey questionnaire were used. Based on the survey respondents' demographics and a

rudimentary comprehension of the study issue, Section A was drafted. Section B items were adopted from the past studies undertaken in the domain of research (Yee, 2018). Section B further has two parts, where section A is based on the "TQM practices for achieving sustainable project management." The section includes six measures, which include Leadership (LS), strategic planning (SP), Customer Focus (CF), measurement, analysis and knowledge management (MM), workforce focus (WF) and operational focus (OF) , those measures were identified as the 6 hypothesis previously in the literature. All the measures used the five-point Likert scale 1 represented "very low," and 5 represented "very high."

Similarly, section B in the questionnaire was based on sustainable Project management, where the section also had three different measures. Economic, social, and environmental sustainability all go under the umbrella term "sustainability" (ES). Five-point Likert Scales (like the one used in this study) were also employed, with 1 being "extremely low" and 5 "very high."

3.3 Mode of Data Collection

This section highlights the choice of research data collection method which has been used in the paper and why it has been chosen. The primary data collection method refers to the medium which is compiled on a completely new basis. This defines how the primary data collection occurs using various surveys, questioners, and target sample audiences. The benefits of using primary data collection show how the research objectives can be achieved with ease. The benefits also include the data variability of the answers and different kinds of other motives. The secondary data collection method refers to the usage

of existing materials for the research. This material can be found through different journals, research papers, conference papers, and websites. The secondary data provides time-saving ventures and is also known to be cost-effective (Chancellor, 2015).

Quantitative data in this research defines different numbers from the survey responses, including the SPSS analytical results. The qualitative information, on the other hand, represents the literature review findings. Both findings can be pooled to analyze the research implications and achieve its objectives. The empirical research will be accomplished in different phases. Participants of the research will be provided with URL links to a self-designed survey. This survey will contain different closed-ended questions that will determine the research objectives and questions.

3.4 Data Analysis

Data Analysis allows the researchers to carry significance to a lot of information gathered in a review (Struwig and Stead, 2001). It is a coordinated combination of information to address the review's targets. To investigate the information gathered in this review, SPSS be utilized to lead the examinations, including the connection between the review factors. SPSS will be utilized to perform information screening and distinct insights. The statistical tests that would be calculated include regression analysis, ANOVA, t-test, and correlation. Thus, the data Analyses will be conducted in the following order.

3.4.1 Pilot Test

The Pilot test is a form of pre-study conducted on several subjects or individuals who are able to show whether there are any deficiencies or not to build a research instrument. In other words, the main aim and objective of conducting a pilot test is to

determine if the results of the survey instrument are detected and corrected before the actual research is carried out. The pilot test often include data collection and taking feedback from a small number of participants to test whether the main objectives that are desired to be achieved from the research are being gained from the questionnaire. The pilot test does not have any formula, but it is a rule of thumb to use 5% of the total sample size as pilot test sample. Therefore, for the pilot test we included 10 sample participants.

3.4.2 Reliability Analysis

To measure the reliability the Cronbach's Alpha has been used. The test measures internal consistency. It tells how the item in the group closers to each other is. The value ranges from 0 to 1 for the accessibility of the reliability. The desired value of Cronbach's Alpha is higher than 0.8, which means that highly reliable and acceptable index. The value range between 0.6 to 0.8 means that reliability is moderate. The value below 0.6 represents that the value is not reliable. The table below represents reliability test results:

Table: Reliability Statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
.955	83

According to the above result, the total number of items is 83 including all Likert scale related questions , the value of reliability is 0.955. The value represents items in the

groups that are highly related to each other. The result obtained from this analysis will be highly reliable.

3.4.3 Descriptive Analysis

The statistical description of the study's constructs will be examined using descriptive statistical analysis. Values or indices of the minimum score, maximum score, mean and standard deviations will be obtained and presented for all the dependent and independent constructs, and all the constructs will be measured in five points Likert scale. The results obtained will provide descriptive parameters of all the constructs.

3.4.4 Correlation Analysis:

For the correlation analysis, the correlation coefficient of the sample is estimated. The correlation coefficient is denoted by the R , which ranges from -1 to +1. The values quantified the strength and direction between the two variables. The negative value of correlation analysis tells that a high level of one factor is linked with the lower level of another factor. The positive value of correlation analysis tells the high level of one factor is linked with the high level of another factor. The sign of the correlation analysis talks about the direction, while the magnitude of the correlation coefficient talks about the strength of the link between two variables. The value 0.9 mean a strong and positive link between the variable, the value -0.2 means a weak and negative link between the variables. A value equal to zero means no link between two continuous variables.

3.4.5 Hypotheses Testing

To successfully assess the structural model and test the hypotheses, Hair et al. (2013) The R^2 , path coefficients, or beta (β) and accompanying t-values through bootstrapping process

with a resample of 100 are advised for examination. Researchers should also describe the scale of their findings in addition to these fundamental metrics, they said (f2). In answering the hypotheses, the coefficient of determination (R^2) will be presented as well. Variance independent factors explained by the independent variables are known as the R^2 value. Thus, the structural model's predictive power is enhanced by the R^2 value. According to Davari and Rezazadeh (2014), the R^2 values are considered weak, moderate, and strong levels when R^2 is 0.19, 0.33 and 0.67, respectively. These values will be used to test the hypotheses.

3.5 Chapter Summary

The chapter provided a detailed discussion of the research methodology that was used to conduct the research on the topic of the impact of TQM for achieving sustainable project management (SPM). The main aim of the chapter was to highlight the ways the data for the research was collected, analyzed and presented in the research. The research adopted a quantitative research approach where all the importance was given to ensure that proper means of data collection, analysis and presentation are adopted to reach the research objectives and answer the research questions.

Chapter 4: Results, Findings, Discussion

This chapter has highlighted the results and findings of this study. It comprised upon analysis of demographic profile and the main variables of this study, where the effect of independent variables is tested through regression analysis. This chapter also highlights the reliability and correlation of variables in addition to descriptive statistics.

4.1. Demographic Profile

One of the important parts of research study is to examine the demographic profile of respondents of the study, which also help readers to evaluate the valuable information regarding appropriate respondents of the study (Yusuf et al., 2014). From table 4.1 to 4.3, researcher has described the demographic characteristics with the help of frequency distribution. Table 4.1 shows that out of 100 respondents, 23% fall in age range 20-30 years, while 33% fall in the age range of 30-40 years, followed by 44% in the age range of 40-50 years. The last age range was comprised upon those participants who are above 50 years; however, no respondent of this study falls in that category. Therefore, from table 4.1, it can be concluded that most of the participants have age between 40-50 years.

Table 4.1. Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30	23	23.0	23.0	23.0
	30-40	33	33.0	33.0	56.0
	40-50	44	44.0	44.0	100.0
	Total	100	100.0	100.0	

The second demographic characteristic is gender, where only 27% are males, while 73% are females in this study. Therefore, based on this information, it can be concluded that majority of the participants in this study are females (*see table 4.2*).

Table 4.2. Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	27	27.0	27.0	27.0
	Female	73	73.0	73.0	100.0
	Total	100	100.0	100.0	

In the third demographic characteristic, researcher has examined the frequency distribution of education of participants, which is categorized as minimum of bachelors to maximum of PhD or professional diploma. Table 4.3 shows that minimum number of participants (6%) hold bachelor's degree, while majority of the respondents (53%) of this study hold master's degree, followed by PhD holders (23%) and Diploma holders (18%). Thus, this information shows that most of the participants of this study hold master's degree.

Table 4.3. Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelors	6	6.0	6.0	6.0
	Masters	53	53.0	53.0	59.0
	PhD	23	23.0	23.0	82.0
	Diploma	18	18.0	18.0	100.0
	Total	100	100.0	100.0	

4.2. Frequency Distribution

In this section, the frequency distribution of first part (excluding demographics) of questionnaire is examined. Here each question of the section is individually analyzed to see whether respondents are satisfying, agreed, or disagreed. The first objective of this study is developed to determine the level of TQM implementation in public service organizations. To fulfill this objective, respondents were asked about the usage of current level of TQM practices in public service organizations. Table 4.4 shows that only 8 and 1 participants have selected unsatisfying and not very satisfying, respectively. On the contrary, 42 participants are satisfying while 30 respondents have selected 'very satisfying', which represents that majority of the participants have highlighted their satisfaction over the current level of TQM practices used in public service organizations. This question has fulfilled the first objective of this study, which requires the identification of current level of TQM in public service organizations. Therefore, in accordance with the objective, it can be concluded that the current level of TQM in public organizations is very satisfying.

Table 4.4. How do you describe the current level of TQM practices used in public service organizations?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfying	30	30.0	30.0	30.0
	Satisfying	42	42.0	42.0	72.0
	Neutral	19	19.0	19.0	91.0
	Unsatisfying	8	8.0	8.0	99.0
	Not very satisfying	1	1.0	1.0	100.0
	Total	100	100.0	100.0	

According to table 4.5, respondents are enquired about their agreement or disagreement over the role of TQM in attaining sustainable development. Out of 100 respondents, 9 respondents are disagreed, while 1 participant is highly disagreed. Conversely, 32 and 48 respondents are agreed and highly agreed, respectively. This table shows that majority of the participants are agreed that TQM plays an important part in attaining sustainable development. This question is also relevant to third objective of this study, which requires the impact of TQM practices on sustainable development. Therefore, in accordance with the findings of this study and third objective, it can be concluded that majority of the participants are agreed over the impact of TQM on sustainable development.

Table 4.5. Do you agree that total quality management play an important part in attaining sustainable development?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Highly agree	48	48.0	48.0	48.0
	Agree	32	32.0	32.0	80.0
	Neutral	10	10.0	10.0	90.0
	Disagree	9	9.0	9.0	99.0
	Highly disagree	1	1.0	1.0	100.0
	Total	100	100.0	100.0	

Like above tables, respondents were also asked about their level of agreement or disagreement regarding the result of effective implementation of TQM in improvement of

good strategies for sustainable project management. Table 4.6 shows that only 7 respondents were disagreed and 3 were highly disagreed. On the contrary, 25 participants were agreed, while 55 respondents were highly agreed. It shows that majority of the participants are agreed that effective implementation of TQM results in good strategies, which help enhance the sustainable project management. This question is also relevant to third objective of this study, which requires examination of TQM on public organizations to achieve sustainable development.

Table 4.6. Do you agree that effective implementation total quality assurance results in good strategies for sustainable project management?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Highly agree	55	55.0	55.0	55.0
	Agree	25	25.0	25.0	80.0
	Neutral	10	10.0	10.0	90.0
	Disagree	7	7.0	7.0	97.0
	Highly disagree	3	3.0	3.0	100.0
	Total	100	100.0	100.0	

Table 4.7 shows that 8 participants are disagree, while 2 are highly disagree. On the contrary, 28 sample respondents are agree, while 48 participants are highly agreed over the statement. Therefore, it can be concluded that majority of the participants are agreed regarding the leadership role in continuous improvement with the help of TQM strategies.

Table 4.7. Do you agree that leadership plays an important role in continuous improvement with the help of TQM strategies?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Highly agree	48	48.0	48.0	48.0
	Agree	28	28.0	28.0	76.0
	Neutral	14	14.0	14.0	90.0
	Disagree	8	8.0	8.0	98.0
	Highly disagree	2	2.0	2.0	100.0
	Total	100	100.0	100.0	

Similarly, respondents were also asked about their agreement or disagreement regarding the challenges which managers face while implementing the TQM to achieve sustainable development. Table 4.8 shows that only 10% respondents are either disagree or highly disagree. On the other hand, 79% participants are either agree or highly agree; therefore, it can be concluded that most of the participants are agreed that managers face challenges while implementing the TQM techniques to achieve sustainable development.

Table 4.8. Do you agree that the managers face challenges in terms of implementing total quality management techniques for achieving sustainable development?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Highly agree	45	45.0	45.0	45.0
	Agree	34	34.0	34.0	79.0
	Neutral	11	11.0	11.0	90.0
	Disagree	7	7.0	7.0	97.0
	Highly disagree	3	3.0	3.0	100.0
	Total	100	100.0	100.0	

Table 4.9 highlights the frequency distribution about respondents' agreement or disagreement over the statement that whether TQM increases the risks and cost of material and equipment or not. According to this table, 10 participants are disagreed or highly disagreed with the statement. On the other hand, a total of 77 respondents (37 agree, 40 highly agree) are agreed that TQM enhances the chances of occurring risks and cost of materials as well as equipment.

Table 4.9. Does TQM come with increased chances of occurring of risks and cost of materials and equipment?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Highly agree	40	40.0	40.0	40.0
	Agree	37	37.0	37.0	77.0
	Neutral	13	13.0	13.0	90.0
	Disagree	6	6.0	6.0	96.0
	Highly disagree	4	4.0	4.0	100.0
	Total	100	100.0	100.0	

Table 4.10 shows the level of agreement or disagreement of participants over the need of highly skilled professionals for implementing TQM in public service organizations. According to this table, only 10 participants are disagreed (5 disagree and 5 highly disagree). On the other hand, 80 respondents (37 agree and 43 highly agree) are agreed regarding the statement. Therefore, it can be concluded that implementation of TQM in public service organizations require highly skilled professionals in UAE. Therefore,

Table 4.10. Do you agree that high skilled professionals are required for implementing TQM in public service organizations in UAE?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Highly agree	43	43.0	43.0	43.0
	Agree	37	37.0	37.0	80.0
	Neutral	10	10.0	10.0	90.0
	Disagree	5	5.0	5.0	95.0
	Highly disagree	5	5.0	5.0	100.0
	Total	100	100.0	100.0	

4.2.1. Multiple Response Analysis

Table 4.11 presents the frequency distribution of a research question, where respondents were provided option that they can choose multiple answers based on their experience and understanding of the asked question. Participants were asked to identify the barriers which may affect the implementation of TQM for achieving sustainable development. This question targets the second objective of this study, which is developed to identify the barriers regarding implementing TQM. Table 4.11 highlights the number and percentage of participants on each option or listed barrier. According to this table, 71% participants selected poor and ineffective managerial support as a barrier in implementing TQM, while 93% respondents have selected fear of implementing TQM as an important barrier in the way of TQM implementation. In addition, table shows that poor leadership is another important barrier, which is highlighted by 54% of the sample participants, while lack of workforce commitment is highlighted by 57% of the participants. Finally, 40% respondents also selected lack of funding and resources as an important barrier in a way of implementing TQM to achieve sustainable development. From this valuable information, it

can be concluded that least significant barrier is lack of funding and resource, while most important and significant barrier in a way of implementing TQM is fear of implementing TQM.

Table 4.11. Barriers in Implementing TQM

		Responses		Percent of Cases
		N	Percent	
Barriers in Implementing TQM	Poor and ineffective managerial support	71	22.5%	71.0%
	Fear of implementing TQM	93	29.5%	93.0%
	Poor Leadership	54	17.1%	54.0%
	Lack of workforce commitment	57	18.1%	57.0%
	Lack of funding and resources	40	12.7%	40.0%
Total		315	100.0%	315.0%

a. Dichotomy group tabulated at value 1.

4.3. Descriptive Statistics and Reliability

Most researchers provide descriptive statistics in order to provide a summarized snapshot of their results as this analysis highlights the mean responses of the variables along with standard deviation (Fisher and Marshall, 2009, George and Mallery, 2016). Mean values show the average responses, while standard deviation (SD) shows the deviation of responses from the mean responses (George and Mallery, 2016). In addition, minimum and maximum values show the on average minimum selected response and maximum selected response. Table 4.12 shows that leadership has mean value 4.4640 (SD=0.452), which represents that most the average responses are toward agreeable side, which means respondents are mostly agreed regarding the effectiveness of leadership

qualities towards implementation of TQM. Similarly, the mean values of strategic planning 4.28 (SD=0.453), customer focus 4.283 (SD=0.453), measurement analysis and knowledge management 4.368 (SD=0.453), workforce focus 4.457 (SD=0.453), operation focus 4.421 (SD=0.453), economic sustainability 4.435 (SD=0.453), social sustainability 4.294 (SD=0.453) and environmental sustainability 4.30 (SD=0.453) are greater than 4, which means that respondents are mostly agreed with the statements. It means, all the variables move towards same direction, which indicates a positive relationship among them.

Table 4.12. Descriptive Statistics and Reliability

	N	Minimum	Maximum	Mean	Std. Deviation	Cronbach's Alpha
Leadership	100	2.60	5.00	4.4640	.45205	.846
Strategic Planning	100	3.20	5.00	4.2800	.45305	.874
Customer Focus	100	3.50	5.00	4.2837	.41471	.767
Measurement Analysis and Knowledge Mgt.	100	3.14	5.00	4.3686	.41323	.883
Workforce Focus	100	2.57	5.00	4.4571	.41114	.805
Operation Focus	100	2.71	5.00	4.4214	.45872	.871
Economic Sustainability	100	2.00	5.00	4.4350	.49825	.861
Social Sustainability	100	3.40	5.00	4.2940	.45612	.876
Environmental Sustainability	100	2.00	5.00	4.3000	.51356	.781
Valid N (listwise)	100					

Apart from above, table 4.12 also highlights the values of Cronbach's alpha, which is commonly used to examine the internal consistency of the scales, which is termed as

reliability. In other words, the reliability indicates the ability of a scale to produce similar results, if it is tested multiple times (Fink and Litwin, 1995). The standard value of Cronbach's alpha is 0.7, which is the minimum criteria of acceptance. Table 4.12 shows that all the values of alpha are greater than 0.7; therefore, indicates the reliability of the scales.

4.4. Correlation Coefficients

Although the same direction of variables in descriptive statistics indicate the positive relationship; however, the significance of relationship and the strength of association is analyzed through correlation coefficients (SchoberBoer and Schwarte, 2018). The significance of the correlation is represented with 'P' and its value should be lower than 0.05. In other words, the correlation between each two variables should be represented with 95% confidence interval, while the remaining 5% is termed as probability of error or significance value and denoted with 'P'. therefore, if significance value is greater than 0.05, it means there is no significant correlation between variables (Barr, 1969, Potter, 1994). Apart from this, the positive relationship indicates that both variables move towards same direction, which means if one variable increases, the other variable will also increase. On the other hand, negative relationship indicates that both variables move in the opposite direction, which means upon increasing one variable, the other variable will decrease.

Table 4.13. Correlations

		1	2	3	4	5	6	7	8	9
Leadership	Pearson Correlation	1								
	Sig.									

Strategic Planning	Pearson Correlation	.519**	1							
	Sig.	.000								
Customer Focus	Pearson Correlation	.417**	.330**	1						
	Sig.	.000	.001							
Measurement Analysis and Knowledge Mgt.	Pearson Correlation	.486**	.720**	.291**	1					
	Sig.	.000	.000	.003						
Workforce Focus	Pearson Correlation	.499**	.490**	.387**	.435**	1				
	Sig.	.000	.000	.000	.000					
Operation Focus	Pearson Correlation	.538**	.526**	.408**	.434**	.645**	1			
	Sig.	.000	.000	.000	.000	.000				
Economic Sustainability	Pearson Correlation	.781**	.321**	.243*	.379**	.437**	.397**	1		
	Sig.	.000	.001	.015	.000	.000	.000			
Social Sustainability	Pearson Correlation	.562**	.814**	.303**	.627**	.304**	.417**	.314**	1	
	Sig.	.000	.000	.002	.000	.002	.000	.001		
Environmental Sustainability	Pearson Correlation	.566**	.735**	.381**	.668**	.565**	.552**	.445**	.517**	1
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000	
	N	100	100	100	100	100	100	100	100	100

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 4.13 shows that leadership has highest positive 78.1% ($p=.000<0.05$) correlation with economic sustainability, while has lowest positive 41.7% correlation with customer focus. This table further shows that strategic planning has least positive 32.1% correlation with economic sustainability, while highest positive 81.4% correlation with social sustainability. Table 4.13 also shows that customer focus has lowest positive 24.3%

correlation with economic sustainability; however, it has highest 41.7% positive correlation with leadership. Similarly, measurement analysis and knowledge management has least positive 29.1% association with customer focus, while it has highest 72% correlation with strategic planning. Workforce focus has least positive 30.4% association with social sustainability, while it has 64.5% highest positive association with operation focus. Apart from above, operation focus has lowest 39.7% positive correlation with economic sustainability; however, it has 64.5% highest positive correlation with workforce focus. Besides, economic sustainability has lowest 24.3% positive correlation with customer focus, while has highest 78.1% correlation with leadership. Table 4.13 also shows that social sustainability has lowest 30.3% positive correlation with customer focus, while it has highest 62.7% positive correlation with measurement analysis and knowledge management. Finally, table 4.13 shows that environmental sustainability lowest 38.1% correlation with customer focus; however, it has highest 73.5% correlation with strategic planning. These all above mentioned relationships are positive, which indicate that all variables are positively connected to each other.

4.5. T-test Analysis

Gerald noted that t-test is used for examining the mean difference between two groups. In this section, the t-test is utilized to measure the mean difference between agreement or disagreement of males and females regarding role of TQM in achieving sustainable management (2018). Table 4.14 shows that the significance value is greater than 0.05, which means that there is no difference between males or females' agreement over the role of TQM to achieve sustainable development.

Table 4.14. Independent Samples Test

		Levene's Test for Equality of Variances				t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference
Do you agree that total quality management play an important part in attaining sustainable development?	Equal variances assumed	1.026	.314	.131	98	.896	.030	.228
	Equal variances not assumed			.140	53.16	.889	.030	.213

4.6. Hypotheses Testing

To test the developed hypotheses or the impact of independent variables on dependent variable, regression analysis is utilized in this study. This test is divided among six different models, where each model represents the impact of a different independent variable on sustainable project management. In the first model, researcher has tested the impact of leadership on sustainable project management.

4.6.1 Hypothesis 1

According to table 4.15, R-value shows that leadership and sustainable project management has 80.5% correlation, while R-square value shows that 64.7% variance in sustainable project management is caused by leadership. Importantly, here the adjusted R-square value indicates the value after adjustment of standard error. Therefore, overall, the

summary of a model is represented by this table, which specifically indicates the correlation and impact of independent variable on dependent variable.

Table 4.15. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.805 ^a	.647	.644	.24045

a. Predictors: (Constant), Leadership

Apart from model summary, in regression analysis, another important table is ANOVA, which is specifically relevant to indicate the model fitness. In general terms, model fitness is necessary to analyse in order to evaluate the discrepancies amid observed variables in the designed model. Therefore, in regression, ANOVA table shows the model fitness, which is analysed through observing the values of F and significance. The F-calculated value should be greater than F-tabulated (which is 4). While the value of significance should be lower than 0.05. According to table 4.16, the significance value is below 0.05, and F-calculated value is greater than F-tabulated value; therefore, it proves the model fitness (first model).

Table 4.16. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.404	1	10.404	179.961	.000 ^b
	Residual	5.666	98	.058		
	Total	16.070	99			

a. Dependent Variable: Sustainable Project Management

b. Predictors: (Constant), Leadership

Like above, table 4.17 shows the coefficients, in which impact of leadership on sustainable project management is highlighted. This table shows that leadership has 71.7% positive impact on sustainable project management. This effect is significant at $p=0.000<0.05$. The beta value shows that on each one-point increase in leadership, sustainable project management will enhance by 0.717. This relationship has proved the first hypothesis of this study.

Table 4.17. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.129	.240		4.706	.000
	Leadership	.717	.053	.805	13.415	.000

a. Dependent Variable: Sustainable Project Management

4.6.2 Hypothesis 2

In the second model, the impact of strategic planning is analysed on sustainable project management. According to table 4.18, R-value shows the correlation of 78.2% between predictor and dependent variable, while R-square value shows that 61.2% variance in sustainable project management is caused by strategic planning.

Table 4.18. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	.782 ^a	.612	.608	.25214

a. Predictors: (Constant), Strategic Planning

The ANOVA table in regression analysis is used to measure the model fitness which, in simple terms, measure the discrepancies between observed variables in the designed model. The model fitness is proved with the help of values of F and significance. According to table 4.19, the significance value is lower than 0.05, and F-calculated value is greater than F-tabulated value; therefore, model it fit for further analysis.

Table 4.19. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	9.840	1	9.840	154.768	.000 ^b
	Residual	6.230	98	.064		
	Total	16.070	99			

a. Dependent Variable: Sustainable Project Management

b. Predictors: (Constant), Strategic Planning

Table 4.20 shows that strategic planning has 69.6% positive impact on sustainable project management at $p=0.000<0.05$. Similarly, here beta value shows that for each one-point increase in strategic planning, sustainable project management will increase by 0.696. This relationship has proved the second hypothesis of this study.

Table 4.20. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	1.352	.241		5.615	.000
	Strategic Planning	.696	.056	.782	12.44	.000

a. Dependent Variable: Sustainable Project Management

4.6.3 Hypothesis 3

In the third model, the influence of customer focus on sustainable project management is tested. Table 4.21 shows that the correlation is 40.6%, while variance in sustainable project management caused by customer focus is 16.5%.

Table 4.21. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
3	.406 ^a	.165	.157	.36998

a. Predictors: (Constant), Customer Focus

To confirm fitness of model, ANOVA table is included for third model as well. Similar to above ANOVA tables, the value of F and significance are important to know the fitness of model. According to table 4.22, the significance value is lower than 0.05, and F-calculated value is greater than F-tabulated value; therefore, model it fit for further analysis.

Table 4.22. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	2.655	1	2.655	19.397	.000 ^b
	Residual	13.415	98	.137		
	Total	16.070	99			

a. Dependent Variable: Sustainable Project Management

b. Predictors: (Constant), Customer Focus

Table 4.23 represents the effect of customer focus on sustainable project management. This table shows that customer focus has 39.5% positive effect on sustainable

project management at $p=0.000<0.05$. The beta value shows that for each one-point increase in customer focus, the sustainable project management will increase by 0.395. This relationship has proved the third hypothesis of this study.

Table 4.23. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
3	(Constant)	2.638	.386		6.837	.000
	Customer Focus	.395	.090	.406	4.404	.000

a. Dependent Variable: Sustainable Project Management

4.6.4 Hypothesis 4

In the fourth model, researcher has evaluated the impact of workforce focus on sustainable project management. According to table 4.24, R-value shows that there is a positive 54.4% correlation between workforce focus and sustainable project management. On the other hand, R-square value shows that 29.5% variance in sustainable project management is caused by workforce focus.

Table 4.24. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
4	.544 ^a	.295	.288	.33989

a. Predictors: (Constant), Workforce Focus

As mentioned above, ANOVA table is used to measure model fitness; therefore, with reference to table 4.25, the significance value is lower than 0.05, and F-calculated value is greater than F-tabulated value; thus, model it fit for further analysis.

Table 4.25. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
4	Regression	4.748	1	4.748	41.103	.000 ^b
	Residual	11.322	98	.116		
	Total	16.070	99			

a. Dependent Variable: Sustainable Project Management

b. Predictors: (Constant), Workforce Focus

Table 4.26 represents the effect of workforce focus on sustainable project management. According to this table, workforce focus has 53.3% positive effect on sustainable project management at $p=0.000<0.05$. The beta value shows that for each one unit increase in workforce focus, the sustainable project management will increase by 0.533. This relationship has proved the fourth hypothesis of this study.

Table 4.26. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
4	(Constant)	1.956	.372		5.259	.000
	Workforce Focus	.533	.083	.544	6.411	.000

a. Dependent Variable: Sustainable Project Management

4.6.5 Hypothesis 5

In the fifth model, researcher has examined the impact of operation focus on sustainable project management. Table 4.27 shows that there is a 57.9% correlation between operation focus and sustainable project management. While R-square value shows that 33.5% variance in sustainable project management is caused by operation focus.

Table 4.27. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
5	.579 ^a	.335	.328	.33018

a. Predictors: (Constant), Operation Focus

According to table 4.28, the significance value is lower than 0.05, and F-calculated value is greater than F-tabulated value; therefore, model it fit for further analysis.

Table 4.28. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
5	Regression	5.386	1	5.386	49.410	.000 ^b
	Residual	10.684	98	.109		
	Total	16.070	99			

a. Dependent Variable: Sustainable Project Management

b. Predictors: (Constant), Operation Focus

Table 4.29 also shows that operation focus has 50.8% positive effect on sustainable project management, and this effect is significant at $p=0.000<0.05$. The value of beta shows that for each one-point increase in operation focus, sustainable project management will increase by 0.508. This relationship has proved the fifth hypothesis of this study.

Table 4.29. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
5	(Constant)	2.082	.322		6.474	.000
	Operation Focus	.508	.072	.579	7.029	.000

a. Dependent Variable: Sustainable Project Management

4.6.6. Hypothesis 6

In the sixth model, researcher has evaluated the influence of measurement analysis and knowledge management on sustainable project management. The R-value shows that there is a 70.6% correlation between measurement analysis and knowledge management and sustainable project management. Table also shows that 49.8% variance in sustainable project management is caused by measurement analysis and knowledge management.

Table 4.30. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
6	.706 ^a	.498	.493	.28677

a. Predictors: (Constant), Measurement Analysis and Knowledge Management

According to table 4.31, the significance value is lower than 0.05, and F-calculated value is greater than F-tabulated value; therefore, model it fit for further analysis.

Table 4.31. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
6	Regression	8.011	1	8.011	97.409	.000 ^b
	Residual	8.059	98	.082		

	Total	16.070	99			
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a. Dependent Variable: Sustainable Project Management

b. Predictors: (Constant), Measurement Analysis and Knowledge Management

According to coefficients table 4.32, measurement analysis and knowledge management has 68.8% positive effect on sustainable project management, and this effect is significant at $p=0.000<0.05$. Here beta value shows that for each one-point increase in measurement analysis and knowledge management, sustainable project management will increase by 0.688. This effect has proved the sixth hypothesis of this study.

Table 4.32. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
6	(Constant)	1.323	.306		4.322	.000
	Measurement Analysis and Knowledge Management	.688	.070	.706	9.870	.000

a. Dependent Variable: Sustainable Project Management

The regression analysis has presented that all the developed hypotheses are accepted. It also shows that in all six models, the independent variables have positive effects on dependent variables; however, the strength of impact varies.

4.7 Discussion

The findings of the research concluded that there lies a significant and positive impact of applying total quality management approaches to the sustainable outcomes of the projects in the UAE region. The data analysis successfully achieved the research objectives and

answered the research question regarding the increased public sector focus on adapting to TQM practices for achieving the sustainable project management.

All the three aspects and pillars of sustainability, economic, social, and environmental sustainability were achieved through the implementation of total quality management dimensions that include knowledge management, operation focus, workforce focus and customer focus. Hence the findings of the research are in accordance with the literature review on the topic of TQM implementation on achieving sustainable project outcomes in the UAE region, and as the topic is newly emerging and there is less collected data specially in the public service organizations, those analysis will help adding new value to the current research base and literature, to open doors for future researchers.

The research also aimed to identify the barrier that is caused in the implementation of the TQM practices in the achievement of sustainable project management. The data analysis identified the barriers towards effective implementation of TQM which include the lack of effective project management, lack of findings, inefficient leadership, and lack of strategic planning for the project success. Therefore, through the implementation and focus given to the TQM dimensions highlighted and identified in the research, the organizations can improve their overall sustainable project management approaches.

Finally, the research analysis and findings helped achieve the third research objectives where the findings from the research data and analysis highlighted the positive relations and impact of TQM on sustainable project outcomes and achievements. Along with that, the research also identified the TQM principles for promoting a sustainable project

management process. These include workforce focus, customer focus, knowledge management, leadership, strategic planning, and operational focus., those variables were clearly mentioned in the literature with, and evidence impact on achieving SPM, focusing on leadership and strategic planning, where having great and well-structured leadership approach will result in the better use of TQM tools that will result having a direct impact of TQM to achieve SPM. considering strategic planning and using the best strategic methods and theories will make a clear direction of the main target, which is achieving SOM through the best and strategic methods of implementing TQM tools throughout the whole project phase and stages, but not only for the final deliverable.

Linking the literature to the results and findings of data analysis, it has been said that previous empirical studies has shown a clear knowledge gap existing in what is the role of TQM in achieving SPM in public service organization, thus the data analysis has proofed the positive impact of using TQM and a comprehensive agreement on the benefits of implementing TQM in the public service organizations.

Chapter 5: Conclusion

5.1 Introduction

The following chapter in the research highlights the conclusion that was achieved through the analysis of the research data and the answers to the research questions, defining the limitations, future work, and a comprehensive summary.

5.2 Summary

The purpose of this quantitative research study was to recognize the role of total quality management (TQM) in attaining sustainable project management across public organizations in the UAE. The research findings supported the literature review, where the research findings specifically highlighted a strong and positive impact of TQM on the successful completion of projects in the contemporary world, and the extent, social, economic, and environmental aspects of the project are determined at the time of quality assurance. Furthermore, the objective of this study was to offer theoretical knowledge on what encourages public service organizations to adopt TQM principles and lead them to the successful implementation of sustainable project management. The study included all those project managers and quality assurance heads that has been part of project management in public service organizations firms for more than five years, including men and women, so that gender diversity aspect is also ensured, and the data is rich with quality information. This study has used a constructivist approach to grounded theory and used semi-structured interviews with project managers and quality assurance members of the public service organizations firms in the UAE. Interviewing such respondents has offered quality insights

to the given phenomenon as to why they want to ensure TQM principles in sustainable project management.

5.3 Limitations

Design and analytic challenges are examples of what researchers call "research limits." Primary data analysis has been the focus of the study. The basic method of data analysis is the use of surveys with real people as the primary source of data. During the investigation, this approach has presented a variety of problems. A wide range of activities, including data analysis and collecting, are involved in these challenges. Ethical norms and standards were used to address the issues that had been raised. These were likewise predicated on completing the study's objectives and conducting an in-depth analysis.

As part of the study, researchers had to deal with the question of access to data and how information was picked for use based on various values and judgments. An employee's unwillingness to provide their personal information is a part of the access. Many individuals were concerned about sensitive information being leaked out as a result. The main technique is the chosen data collecting medium, and it is excellent if various live participants are required for the qualitative and quantitative analysis of data. This shows that individuals were not hesitant to share their personal information with the researchers. Everyone had a clear understanding of what was going to happen to their personal information, email, and privacy. Ethical considerations for research investigations also include the assurance of this aspect. Research has also brought up a second problem, which is of utmost relevance. As a result, this problem gives vital information on how various time periods were managed and addressed when collecting data.

The first phase of the time problem was detected in the data gathered from all participants. The employee was often seen to be engrossed with their task—these results in significant delays in meeting the minimum number of participants required for the study. Different approaches to resolving the problem of running out of time were taken. The first strategy involves sending out a notification to all participants in the research, which was sent out in advance. Detailed information regarding the study's duration and the survey's deadline was provided in the preceding notification. Additionally, the time constraint was confronted when compiling the data analysis.

5.4 Recommendation

There are many projects initiated in the UAE region where the achievement of sustainable outcomes has been given utmost importance by the project managers. The research findings highlighted that the TQM approaches applied to the projects management practices results in the achievement of sustainable project management outcomes that are desired by the project managers and professionals in the UAE region. Therefore, based on the research outcomes and findings, the project managers and sponsors are recommended to efficiently use the TQM approaches to increase sustainability in their project management practices through all processes and stages not only at closing project stage. Leaders are one of the most important and critical success factors for project management success. Therefore, the leadership is recommended to be effective and efficient in strategy planning and directing the performance and progress of TQM implementation in project management. Leaders are recommended to enhance their staff skill and knowledge about the current used quality tools and increase their knowledge on how TQM can help attain SPM.

The research findings also recommend giving importance to the operational focus, customer focus and workforce focus in drafting project management strategies and practices. This helps bring more innovation and creativity in the project deliverables where the projects are specifically designed to benefit all the stakeholders. The leadership and project managers should also focus on the development of knowledge among the project team to gain sustainability in the project management practices.

According to the latest statistics published earlier by the IBM mentioned earlier in the literature, 52% of organizations are redesigning their businesses considering sustainability, thus it is recommended for leaders and managers in public service organization to use the current quality manuals such as ISO14000 and ISO9001 internally to conduct self-assessments and internal audits, even if they are not seeking certification, using such manuals can enhance the organizational agility and lead to better practices of TQM that have a direct impact on projects sustainability, where in the survey most of the respondents agree that implementing TQM can result in better SPM achievements.

5.5 Future Direction

The research focused on the TQM impacts on the achievement of sustainable project management in the public sector of UAE. Future research could be carried out to a more narrowed approach, where the researchers could identify the external factors that impact the successful implementation of TQM in project management and similarly, the researchers can investigate the impact of other quality management approaches like lean six sigma or continuous quality improvements on sustainable project management. Similarly, future research can focus on any one specific sector where the researchers can find out the impact

of TQM approaches and practices on any one industry, for example, instruction contracts or in the oil and gas industry. It was clearly mentioned through the literature gap analysis that the current literature on public service organization is very limited, so future researchers can focus more on the public service organizations in the future, which will lead to have enough research compared to available data on private sector, which can clearly open the doors for big comparison and investigation studies.

5.6 Conclusion

The research was carried out to find the impact that the application of TQM have on the achievement of sustainable project outcomes. The research analysis and finds highlighted a strong and positive impact of the implementation of TQM in the project management process which enables the projects to achieve sustainable outcomes. The findings of the research are aligned with the current literature that also highlight that there lies a positive impact of TQM implementation in achieving sustainable project management outcomes. As per the review of the literature, TQM has potential to improve the long-term viability of a project management process and provide measurable outcomes have not been well explored in the present body of research. However, the literature review highlighted the impact of TQM approached on the manufacturing industry and very limited in the public sector therefore the current research fills the gap in the literature by providing understanding of what drives project managers to improve TQM and provide better services of sustainable project management. The research findings also highlighted and offered a theoretical knowledge on what encourages public service organizations to adopt TQM principles and lead them to the successful implementation of sustainable project management.

The research findings also provide detailed knowledge regarding the positive outcomes of the TQM applications and process within the projects of public organization where through the implementation of TQM approaches, the public organization were able to achieve all the three aspects and pillars of sustainability, economic, social, and environmental sustainability.

Another significant finding of the research included the identification of the TQM factors and dimensions that include knowledge management, operation focus, workforce focus and customer focus. Research also found out the most important barriers that causes major issues in the implementation of TQM practices in the public sector projects. The research found out those barriers towards effective implementation of TQM which include the lack of effective project management, lack of findings, inefficient leadership, and lack of strategic planning for the project success. Therefore, through the implementation and focus given to the TQM dimensions highlighted and identified in the research, the organizations can improve their overall sustainable project management approaches.

To conclude the whole study, and according to the collected and analyzed data, it was clearly addressed that Total quality management have a great and direct impact on achieving sustainable project management, despite many future research is required as emerging new trendy topic, researchers and Scientifics's can use the current research as the primary source for wilder and bigger investigation in the future. The research question and objectives are answered above, however the study can be further improved by considering in depth analysis and niched approach, as well as comparison studies of two different sector or industries.

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Appendix A: ETHICS CONSENT FORM

COVER LETTER

Master Dissertation on Total Quality Management for Achieving Sustainable Project Management in the UAE Services Sector

Dear Sir/Madam,

I am a Master student (Project Management) at the faculty of Business and law The British University in Dubai. I am working on a research project that is focused on "The Impact of Total Quality Management in achieving sustainable project management". Currently, I'm in the process of collecting data for my MSc dissertation. To accomplish the research objectives, your valuable input is required, and it is, therefore, requested to kindly participate in this survey.

This survey questionnaire is designed to contribute to the literature of project management through a better understanding of the Total Quality Management approach for achieving sustainability aspects in the project management process.

CONFIDENTIALITY.

Your information will be kept private and will not be shared with other participants, persons, or organizations. Additionally, we assure that the data obtained will be utilized solely for research purposes. We would be pleased to share the findings of our research with you for your information and future usage. We anticipate that the survey will take around 15 minutes to complete. We are grateful for your involvement in this research project.

Sincerely,

Fuad

Appendix B: SURVEY QUESTIONNAIRE

Section 'A'

1. Age of the respondents
 - ☐ 20-30
 - ☐ 30-40
 - ☐ 40-50
 - ☐ 50 and above
2. Gender of the respondents
 - ☐ Male
 - ☐ Female
3. What is your educational background?
 - ☐ Bachelors
 - ☐ Masters
 - ☐ PhD
 - ☐ Diploma
4. How do you describe the current level of TQM practices used in public service organizations?
 - ☐ Very satisfying
 - ☐ Satisfying
 - ☐ Neutral
 - ☐ unsatisfying
 - ☐ Not very satisfying
5. Do you agree that total quality management play an important part in attaining sustainable development?
 - ☐ Highly Agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree
 - ☐ Highly Disagree

6. Do you agree that effective implementation total quality assurance results in good strategies for sustainable project management?
 - ☐ Highly Agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree
 - ☐ Highly Disagree
7. Do you agree that leadership plays an important role in continuous improvement with the help of TQM strategies?
 - ☐ Highly Agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree
 - ☐ Highly Disagree
8. Do you agree that the managers face challenges in terms of implementing total quality management techniques for achieving sustainable development?
 - ☐ Highly Agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree
 - ☐ Highly Disagree
9. Does TQM come with increased chances of occurring of risks and cost of materials and equipment's?
 - ☐ Highly Agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree
 - ☐ Highly Disagree
10. What barriers of the below you think mostly affect Implementing TQM to achieve sustainable project management?

- Poor and ineffective managerial support
- Fear of implementing TQM
- Poor leadership
- Lack of workforce commitment
- Lack of funding and resources

11. Do you agree that high skilled professionals are required for implementing TQM in public service organizations in UAE?

- Highly Agree
- Agree
- Neutral
- Disagree
- Highly Disagree

Section ‘B’

Section 1: Total Quality Management (TQM) practices for Achieving Sustainable Project Management					
Please circle one number per line to indicate the extent to which the frequency of practice in your organization based on your assessment, perception or opinion, where (1) = very low, (2) = low, (3) = medium, (4) = high; and (5) = very high.					
Leadership					
LS1	Top management establishes and sustains clear and visible customer-focused quality vision, values and mission.	1	2	3	4 5
LS2	Top management participates in quality management and improvement process	1	2	3	4 5
LS3	Top management hold meetings discusses and reviews quality-related issues	1	2	3	4 5
LS4	Top management encourages quality-related concepts and skills	1	2	3	4 5
LS5	Top management allocates adequate resources for quality improvement	1	2	3	4 5
LS6	Top management pursues long-term quality improvement process	1	2	3	4 5
Strategic Planning					
SP1	A mission statement which has been communicated throughout the company and is supported by employees	1	2	3	4 5
SP2	A comprehensive structured planning process which regularly sets and reviews short and long-term goals	1	2	3	4 5
SP3	Incorporate supplier capabilities and needs of other stakeholders including the community when develops organization's plans, policies, and objectives	1	2	3	4 5
SP4	Organization's strategic plans and tactical plan are linked to quality values	1	2	3	4 5
SP5	Integrate continuous quality improvements into planning process	1	2	3	4 5
Customer Focus					
CF1	Customer focused practice and culture	1	2	3	4 5
CF2	Provide mechanism for customer feedback	1	2	3	4 5
CF3	Take customer complaints as continuous improvement process	1	2	3	4 5
CF4	Review customer complaints and take into consideration for product innovation	1	2	3	4 5
CF5	Conduct a customer satisfaction survey	1	2	3	4 5
CF6	Conduct market study to collect suggestions for improving product	1	2	3	4 5
Measurement, Analysis and Knowledge Management					
MM1	Implement organizational performance measurement system	1	2	3	4 5
MM2	Conduct organizational performance measure at a constant time interval period	1	2	3	4 5
MM3	Data and information collection at all levels and in all parts of organization	1	2	3	4 5

MM4	Analyse and review the data and information collected	1	2	3	4	5
MM5	Availability of key performance figures for analysis and decision making	1	2	3	4	5
MM6	Performance review findings for continuous improvement and innovation	1	2	3	4	5
MM7	Benchmarking of other firms' product quality and procedures	1	2	3	4	5
Workforce Focus						
WF1	Provide training and development process for all employees	1	2	3	4	5
WF2	Encourage teamwork and problem solving among employees	1	2	3	4	5
WF3	Employee performance are monitored and measured	1	2	3	4	5
WF4	Measure employee satisfaction	1	2	3	4	5
WF5	Maintain a working environment that contributes to the health, safety and well-being of all employees	1	2	3	4	5
WF6	Promote compensation, recognition, and reward system among employees	1	2	3	4	5
WF7	Instil quality culture on continuous improvement among employees	1	2	3	4	5
Operation Focus						
OF1	Develop a set of key work processes	1	2	3	4	5
OF2	Establish Key Performance Indicators (KPIs) for monitoring purpose	1	2	3	4	5
OF3	Practice daily operation work processes report system	1	2	3	4	5
OF4	Monitor and reviews on work processes performance	1	2	3	4	5
OF5	Use of approaches or tools to improve process performance and reduce variability	1	2	3	4	5
OF6	Exercise two-way communication with suppliers	1	2	3	4	5
OF7	A well-prepared disaster and emergency preparedness system to ensure the continuity organization's operations	1	2	3	4	5
Section 2: Sustainable Project Management						
Please circle one number per line to indicate the extent to which you agree or disagree with the following statement, where (1) = strongly disagree, (2) = disagree, (3) = neutral, (4) = agree; and (5) = strongly agree.						
Based on my experience with recently completed projects, I think this company:						
Economic Sustainability:						
ES1	Obtains the greatest profits	1	2	3	4	5
ES2	Tries to achieve long term success	1	2	3	4	5
ES3	Improves its economic performance	1	2	3	4	5
Social Sustainability:						
SS1	Is committed to improving the welfare of the communities in which it operates	1	2	3	4	5
SS2	Is concerned about health and safety of communities in which it operates	1	2	3	4	5
SS3	Is committed towards improving occupational health and safety of employees	1	2	3	4	5

SS4	Sustainability for governmental sectors	1	2	3	4	5
Environmental Sustainability:						
ES1	Focuses on environmental issues	1	2	3	4	5
ES2	Makes the most efficient use of the resources available in the environment	1	2	3	4	5
ES3	Recycle, reuses and reduces waste	1	2	3	4	5