

NEAR EAST UNIVERSITY GRADUATE SCHOOL OF SOCIAL SCIENCES INNOVATION AND KNOWLEDGE MANAGEMENT PROGRAM

EXAMINING THE ROLE OF TOTAL QUALITY MANAGEMENT IN CORPORATE SUSTAINABLE DEVELOPMENT THROUGH THE MEDIATING EFFECT OF KNOWLEDGE MANAGEMENT AND GREEN INNOVATION

JAWAD ABBAS

PhD THESIS

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THESIS SUPERVISOR Prof. Dr. Mustafa Saĝsan

> NICOSIA 2019

ACCEPTANCE/APPROVAL

We as the jury members certify the 'Examining the role of total quality management in corporate sustainable development through the mediating effect of knowledge management and green innovation' prepared by the Jawad Abbas defended on 27/06/2019 has been found satisfactory for the award of degree of PhD.

JURY MEMBERS

Prof. Dr. Mustafa Saĝsan (Supervisor)

Near East University Department of Innovation and Knowledge Management

Prof. Dr. Şerife Zihni EYÜPOĞLU (Head of Jury) Near East University Faculty of Economics and Administrative Sciences

> **Prof. Dr. Harun ŞEŞEN** European University of Lefke Department of Business Administration

Associate Prof. Dr. Erdem Kirkbesoglu Baskent University, Ankara Department of Management Information System

Assistant Prof. Dr. Ahmet Ertugan Near East University Department of Marketing

Prof. Dr. Mustafa Saĝsan Graduate School of Social Sciences Director

DECLARATION

I Jawad Abbas, hereby declare that this dissertation entitled 'Examining the role of total quality management in corporate sustainable development through the mediating effect of knowledge management and green innovation' has been prepared myself under the guidance and supervision of 'Prof. Dr. Mustafa Saĝsan in partial fulfilment of the Near East University, Graduate School of Social Sciences regulations and does not to the best of my knowledge breach and Law of Copyrights and has been tested for plagiarism and a copy of the result can be found in the Thesis.

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DEDICATION

This thesis is dedicated to my loving parents, my wife, my beautiful daughter, my brothers and sisters and all family members who paved the way.

ABSTRACT

Examining the role of total quality management in corporate sustainable development through the mediating effect of knowledge management and green innovation

Total quality management (TQM) has been widely acknowledged as a management system having great potential to improve organizational operational and financial performance. In the current study, the author analysed how TQM effects corporate sustainability. Considering the importance of knowledge management (KM) in the present era's business strategies, the author took KM as a mediating variable and examined how the relationship between TQM and corporate sustainable development (CSD) is mediated by the KM. The author also examined how KM impacts on green innovation which is believed to be a key enabler for CSD. Six core constructs of TQM, namely leadership, strategic planning, process management, customer focus, information and analysis and human resource management have been taken from the Malcolm Baldridge National Quality Award (MBNQA). CSD has been measured through three constructs, namely environmental, social and economic sustainability. KM has been measured through four constructs, namely knowledge creation, acquisition, sharing and application. Green innovation has been measured two constructs, namely green technological innovation and green management innovation. Using the nonprobability convenience sampling technique, the author collected data from junior, middle and senior manager of medium and large manufacturing and services firms located in five prominent business cities in Pakistan. The author followed the multivariate statistical technique, followed by structural equation modelling (SEM) to analyse the causal relationship between the variables. The empirical analyses indicated that TQM significantly impacts on CSD. TQM also found to have a significant and positive impact on KM. The analysis of the mediation effect indicated significant results, indicating the partial mediation caused by KM in the relationship between TQM and CSD. The analysis of KM on green innovation also indicated significant positive results. The dimensional analysis indicated an insignificant impact of TQM on knowledge creation and KM also indicated an insignificant impact on social sustainability. All the

other dimensions indicated significant and positive results. Moreover, KM is also found to have a significant and positive impact on corporate green performance. During the contextual analysis, environmental sustainability indicated significant result with respect to industry-type and social sustainability indicated significant result with respect to firm size. The current study provides valuable insights to the managers of manufacturing and services firms with respect to the role of TQM in achieving corporate sustainability and KM. It also enriches the inadequate literature on the relationship between the studied variables and highlights prospects for future researches.

Keywords: Total quality management, Knowledge management, Sustainability, Green innovation, Organizational performance

Bilgi yönetimi ve yeşil yeniliğin aracılık etkisiyle toplam kalite yönetiminin kurumsal sürdürülebilir kalkınmadaki rolünün incelenmesi

Toplam kalite yönetimi (TKY), kurumsal, operasyonel ve finansal performansı iyileştirme potansiyeli yüksek bir yönetim sistemi olarak kabul görmüştür. Bu çalışmada yazar, TKY'nin kurumsal sürdürülebilirliği nasıl etkilediğini analiz etmiştir. Bilgi yönetiminin (BY) günümüzün iş stratejilerindeki önemi göz önüne alınarak, yazar BY'yi aracı bir değişken olarak aldı ve TKY ile kurumsal sürdürülebilir kalkınma (KSK) arasındaki ilişkinin BY tarafından nasıl yönlendirildiğini inceledi. Yazar ayrıca, BY'nin yeşil inovasyona nasıl etki ettiğini ve kilit bir faktör olduğunu düşünüyor. TKY'nin altı temel yapısı, liderlik, stratejik planlama, süreç yönetimi, müşteri odaklılık, enformasyon ve analiz ve insan kaynakları yönetimi Malcolm Baldridge Ulusal Kalite Ödülü'nden (MBNQA) alınmıştır. KSK, çevresel, sosyal ve ekonomik sürdürülebilirlik olmak üzere üç yapı ile ölçülmüştür. BY, bilgi oluşturma, alma, paylaşma ve uygulama olmak üzere dört yapıyla ölçülmüştür. Yeşil inovasyon, yeşil teknolojik inovasyon ve yeşil yönetim inovasyonu olmak üzere iki yapı olarak ölçülmüştür. Olasılık dışı örnekleme tekniğini kullanan yazar, Pakistan'ın önde gelen beş iş şehrinde bulunan küçük, orta ve büyük ölçekli imalat ve hizmet şirketlerinin ilk, orta ve üst düzey yöneticilerinden veri topladı. Yazar değişkenler arasındaki ilişkiyi analiz etmek için çok değişkenli istatistiksel tekniği ve ardından vapısal esitlik modelini (YEM) takip etti. Ampirik analizler, TKY'nin YDY'yi önemli ölcüde etkilediğini göstermiştir. TKY, BY üzerinde de önemli ve olumlu bir etkive sahip olduğunu buldu. Arabuluculuk etkisinin analizi, TKY ile YEM arasındaki ilişkide BY'nin kısmi arabuluculuğunu gösteren önemli sonuçlar vermiştir. BY'nin yeşil yenilik üzerindeki analizi de önemli olumlu sonuçlar vermiştir. Boyutsal analiz, TKY'nin bilgi yaratma üzerinde önemsiz bir etkisi olduğunu ve BY'nin sosyal sürdürülebilirlik üzerinde de önemsiz bir etkisi olduğunu göstermiştir. Diğer tüm boyutlar anlamlı ve olumlu sonuçlar vermiştir. Ayrıca, BY'nin kurumsal yeşil performans üzerinde de önemli ve olumlu bir etkisi olduğu tespit edildi. Bağlamsal analiz sırasında çevresel sürdürülebilirlik, endüstri tipi ve sosyal sürdürülebilirlik açısından ve firma büyüklüğü açısından önemli sonuç verdiğini belirtti. Mevcut çalışma, imalatçı ve hizmet firmalarının yöneticilerine TKY'nin kurumsal sürdürülebilirlik ve BY'yi sağlamadaki rolü konusunda önemli bilgiler sunmaktadır. Ayrıca, çalışma incelenen değişkenler hakkındaki literatürdeki eksiklere değinmekte ve arasındaki ilişki gelecekteki araştırmalar için referans olmaktadır.

Anahtar Kelimeler: Toplam kalite yönetimi, Bilgi yönetimi, Sürdürülebilirlik, Yeşil yenilik, Örgütsel performans

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LIST OF ABBREVIATIONS

ASQ	American Society for Quality
BEM	Business Excellence Model
BPM	Business Process Management
BPR	Business Process Reengineering
СМ	Change Management
CSP	Corporate Social Performance
CSR	Corporate Social Responsibility
CSD	Corporate Sustainable Development
EFQM	European Foundation for Quality Management
GRI	Global Reporting Initiative
HRM	Human Resource Management
IT	Information Technology
ISO	International Organization for Standardization
KM	Knowledge Management
MBNQA	Malcolm Baldridge National Quality Award
MIS	Management Information System
NGO	Non-government Organizations
OD	Organizational Development
OS	Organizational Sustainability
PDCA	Plan, Do, Check and Act
QM	Quality Management
R&D	Research and Development
RBV	Resource Based View
SME	Small and Medium-size Enterprises
0-01	Socialization, Externalization, Combination and
SECI	Internalization
SEM	Structural Equation Modelling
SD	
SIQ	Swedish Institute for Quality
	Total Quality Management
IBL	I riple Bottom Line
UN	
UNGC	United Nations Global Compact
US WOD	United Sates
WSD	Whole System Design

CHAPTER 1

INTRODUCTION

This chapter provides information about the background of the study, followed by describing the aims and objectives, outlining the research questions, highlighting the significance, specifying the scope and limitation of the study and stating the design of the thesis.

1.1- Background

The last few decades have witnessed a number of social, political, technological, and environmental changes. These changes not only have transformed the operational circumstances of organizations, but also have changed the demands and preferences of customers (Abbas, Muzaffar, Mahmood, Ramzan, & Rizvi, 2014). Because of technological revolution, the businesses in the present era are experiencing global competition as the internet has eliminated the geographical boundaries. Therefore, maintaining a competitive advantage for organizations has become a real challenge (Yusr, Mokhtar, Othman, & Sulaiman, 2017). Companies have to ensure quality in their operations so that their customers' trust and satisfaction can be achieved. Moreover, to sustain the competitive advantage, organizations have to be innovative and perform their operations by considering the customers' expectations. They have to improve their products and services quality, which ultimately leads to improved organizational performance. In this regard, it is imperative for the organization to understand the factors which drive the organizational performance.

The concept of quality management has taken a lot of attention among the businesses during the last three decades. Although different businesses have different

aims and objectives, however, the value of customers is vital in all fields. Similarly, the organizational ability to fulfil customers' requirements has fundamental importance to achieve long term success. The last two decades have proved the importance of quality management as enabler of competitiveness and a valuable tool for achieving organizational goals. Because of operational and technological changes, the system for managing quality and control also has rapidly evolved. One of the indicators for this change is that steady increase in the adoption of quality standards, such as International Organization for Standardization (ISO) 9000, by a large number of organizations across the world. Since 1970, the organizational activities to simply inspect the operations and product and services have either been replaced or enhanced by the assurance of quality management and quality control. Therefore, a large volume of organizations is adopting total quality management (TQM) practices. In comparison to other quality concepts, such as quality assurance and quality control, TQM is a wider and comprehensive as, instead of focusing on particular product or service part, TQM covers the whole organization. In management theories and practices, TQM has been recognized as a significant and valuable tool to enhance organizational performance. In the present literature of quality, TQM has become a frequent term for discussing quality. Moreover, since the 1990, the ratio of organizations implementing TQM practices in their operations also has steadily increased in the western countries.

TQM is widely recognized as a system having great potential to strengthen the firm as well as individual performance. It also facilitates the organization in achieving the competitive advantage (A.A.A. Zwain, Lim, & Othman, 2017). According to Al-Dhaafri, Al-Swidi, and Yusoff, (2016), TQM not only has the potential to increase organizational profitability, but also significantly enhances customers' and employees' satisfaction. One of the key reasons for this tendency is that TQM practices aim for continuous improvement in all aspects. Because of its focus on continuous improvement TQM aim to provide greater customer value, boosted profitability and enhanced productivity (C.-H. Wang, Chen, & Chen, 2012). Quality management practices leads to competitive products or services, with superior quality with minimum cost and delivery time. These practices focus on dignity of human, both customers and employees, and their

satisfaction, and develop loyalty between organization, employees, customers, and stakeholders (McAdam & Leonard, 2003).

All organizations, such as large or small, public or private, manufacturing or services, are benefiting from the TQM practices. This is because that all organizations, apart from their industry, financial status and size, are engaged in quality enhancement activities (Hodgetts, 1996). As small organizations play more important role in the economy, they have gained more interest in adopting TQM practices, especially since the introduction of the Bolton Report in 1971 (Bolton, 1971). Small firms are one of the biggest means of creating jobs, innovation, and the development of economy. Similar situation prevails in Pakistan where most of the organizations are small.

Quality management practices are equally important for small as well as large organizations. This is because of the characteristics that vulnerability shifts the market trends. Similarly, the increased and changing customer demands, not only have reshaped the small organizations, but also have significantly modified the operations of medium and large organizations. It is evident from the literature that all types of organizations benefit from the TQM practices. For this reason, it is claimed that techniques and concepts of TQM are same for small, medium, and large businesses. However, in small organizations, in many cases, the owner also serves the manager's role. This is because of the governing position of the manager. The firm relies more on owner's interests and competencies. A large volume of organizations adopts TQM practices in a response to the changes occurring in the market. The TQM practices can act as change agents in the organization. For this reason, the strategies for implementing TQM should be well-adopted. Moreover, the intangible aspects, for example the involvement of management and employees, and the understanding of objectives have critical importance. Hansson (2003) recommended for adopting a framework to implement change, irrespective of organizational size and type.

A number of researchers have investigated the relationship between TQM and organizational performance. As the roots of TQM are predominantly established in the industry, a number of organizations take it as a management paradigm. Considering the advantages of TQM, in the beginning, it gained a lot of attention from profit seeking organizations, mainly the manufacturing ones. With the passage of time, non-profit

organizations, such as education institutions and health sector, also started adopting it. The models of TQM in manufacturing and services industries are based on the orientation of quality workers, involving the core elements of TQM, such as leadership, strategic planning, customer focus, continuous improvement, employees' participation, and related elements, required for the successful implementation of TQM and achieving organizational goals.

The rapid development in realizing the importance of TQM in different industries was mainly started in 1980 in the Western World and was caused by strong global competition which made the organizations to concentrate on improvement in products and services (Deming, 1986). Organizations which efficiently implemented TQM in their operations experienced improved financial performance, one of the three components of Triple Bottom Line (TBL).

1.2- Aims and Objectives of the Research

Principally, the present research aims to investigate and add answers to questions that how organizations can achieve the goal of sustainable development in more effective and efficient manners. In this context, the word effective means the organizational ability to do the things by focusing on sustainable development (SD) practices. Similarly, an organization is considered an efficient if they perform their functions in the right way which ultimately leads to their higher sustainability ratio with respect to the utilization of resources. Organizational efficiency and effectiveness for SD includes a number of elements, such as enhanced quality, stakeholders' satisfaction, improved financial performance, better social and environmental performance etc. The present thesis aims to investigate the relationship between TQM and corporate sustainable development (CSD) and discusses that how TQM practices can help the organization to achieve SD objectives.

The relationship between TQM and SD is investigated in three different manners. In the first level, the researcher investigated the relationship between TQM and SD as single concept by using six core constructs of TQM given in Malcom Baldridge National Quality Award (MBNQA), namely leadership, strategic planning, customer focus, process management, human resource management, and information and analysis. The construct of CSD has been examined through three dimensions, namely environmental, social and economic sustainability. In the second level, the author conducted dimensional analysis between TQM and CSD constructs and examined how TQM impacts on different dimensions of CSD. In the third level, the researcher analysed the mediating role of knowledge management (KM) in the relationship between TQM and SD. For this purpose, four dimensions of KM, namely knowledge creation, knowledge acquisition, knowledge sharing and knowledge application have been used in this study. According to Xie, Huo and Zou (2019) and Hussain, Rigoni Orig (2018), firms cannot achieve SD objectives without innovation. For this reason, the author examined the role of KM in green innovation and analysed how green innovation impacts on CSD.

While investigating the impact of TQM practices on organization performance most of the researchers have focused on manufacturing industry and have paid little attention to service. Therefore, the present research also aims to investigate that is there any significant difference in impact of TQM practices on organizational SD in manufacturing and service industry. Similarly, considering Isaksson (2004) and Mahmood, Hashmi, Shoaib, Danish and Abbas (2014) argument that SD and TQM practices are useful in first world and big organizations, the present study also investigate the role of organizational size in implementing TQM practices and its impact on organization SD. Therefore, the results of the study would be useful for all type of industries and organizational sizes.

Considering the previous discussion, the present thesis has following objectives;

- 1. To investigate the relationship between TQM practices and CSD
- 2. To investigate is the role of KM in the relationship between TQM and CSD
- 3. To examine how KM impacts on organizational green performance, leading to CSD
- To investigate whether the organizational-size and industry-category play significant role in the relationship between TQM, KM, green innovation and CSD

The first four objectives would be achieved by following quantitative techniques in the firms that have implement TQM practices in successful manners. The fifth objective would be achieved by following qualitative approach, such as studying, describing, and analysing the literature.

1.3- Research Questions

Considering the above discussion, the present study focuses on answering the following questions;

- What is the relationship between TQM and CSD?
- What is the relationship between TQM and KM?
- What is the relationship between KM, green innovation and CSD?
- Does the KM mediate the relationship between TQM and CSD?
- How the industry type and firm size impact on the relationship between TQM, organizational SD, and KM?

1.4- Significance of the Study

TQM has experienced valuable attention from academician and practitioners. A number of studies have explored this concept from different angles. Because of its focus on continuous improvement, this concept has become even more important in almost all sectors. With the emergence of sustainability concept, firms, particularly manufacturing ones, are facing strong pressure from environmentalists, different international institutions and related stakeholders to follow environment-friendly practices (Abbas & Sağsan, 2019). The literature provides in adequate studies on SD, particularly in South Asian countries, such as Pakistan, India, Sri Lanka etc. The present study's idea for examining the link between TQM and CSD has great significance since firms located in developing countries, especially Pakistan (the region of the current study), has paid inadequate attention to quality management practices, and even rare attention to sustainability. For this reason, it is imperative to investigate how TQM (as a management system) can enable firms to achieve SD objectives.

The current study also examines the important role of KM in the relationship between TQM and CSD. According to <u>Ooi (2014)</u>, KM has great importance for firm to achieve short and long-term objectives. It acts as a facilitator to enhance organizational capabilities to design effective strategies and execute it, accordingly. Although there are

few studies that have studied the link between TQM and KM, most of studies only partially examined these variables' relationship or their results are inconsistent and lack to adhere to practical implications. It is critical to conduct a study that comprehensively study the link between TQM and KM, especially in emerging economies where knowledge can greatly enhance firms' abilities to discover new opportunities and achieve competitive advantage.

The current study is expected to make significant contribution and extend the literature available on TQM, KM, green innovation and CSD. It is expected that this study will provide valuable insights to academician and practitioners about the role of TQM in CSD and KM through theoretical and empirical evidence, discussed in the upcoming chapters. From the theoretical perspective, the author based his arguments on 'theory of knowledge management', 'theory of sustainable development', 'green theory' and 'Malcolm Baldridge National Quality Award', and examined how different variables analysed in the present study are linked. From empirical perspective, the author examined the relationship between TQM, CSD and KM through structural equation modelling (SEM) so that not only the causal relationship can be examined, but also the dimensional association. The multivariate statistical analyses conducted in this study along with SEM will provide rigorous analyses and results with respect to causal relationship between TQM, KM, green innovation and CSD, and will open new windows for future researches related to these variables.

Another significance of the study is that it takes industry-type and firm-size as control variables. With reference to industry-type, the author divided the sampled firms into manufacturing and services groups. The reason for this division is that manufacturing and services industries operate in different perspective. This study will explain whether the relationship between TQM, KM and CSD varies from manufacturing industry to services industry or both industries share similar values. The second control variable of the study is the firm-size. The author divided firm-size into medium and large organizations. According to <u>Abbas and Sağsan (2019)</u>, large-firms have more resources than small or medium-size. For this reason, the author aimed to examine whether firm-size significantly effects the relationship between TQM, KM and CSD or not.

1.5- Scope and Limitations

The present study follows quantitative approach as this approach is most appropriate for examining the causal effect and testing the formulated hypotheses. The target population for this study consists of manufacturing and services firms registered on the Securities and Exchange Commission of Pakistan. The empirical data is collected from junior, middle and senior manager of medium and large-size manufacturing and services firms using self-administered questionnaire. The author selected managers as the unit of analysis since they not only have knowledge about their organizational policies, but also are fully aware of practices. Moreover, the managers are also responsible for implementing strategies in their department.

Pakistan is one of the highly populated countries in the world. Because of political and security issues, it is facing vulnerability and uncertainty in economic growth. The concept of TQM and KM in firms located in Pakistan is at intermediate level. Moreover, there are even few firms which are paying attention to SD techniques. The author collected data from organisations located in five leading business venues (cities) in Pakistan, namely Karachi, Lahore, Islamabad, Sialkot and Faisalabad. These five cities are considered as major business centres in Pakistan as most of businesses are located there.

1.6- Design of the Thesis

This thesis is divided into seven chapters. The first chapter gives the introduction and background of the study with research aims and questions, significance of the study and outlining the scope and limitations. Chapter number two, three and four include detailed literature pertaining to TQM, CSD and KM, respectively. In the fifth chapter, the author explained the conceptual framework and proposed hypotheses of the study. The sixth chapter addresses the methodology adopted for data collection and analysis, including research design, target population, sampling technique, operationalization of the instrument and provides information about results of the study. Chapter number seven discusses the results in detail and highlights the implication, limitations, future studies and provides concluding remarks.

CHAPTER 2

REVIEW OF LITERATURE – TOTAL QUALITY MANAGEMENT

2.1 - Background of Quality and Quality Management

TQM is an organizational approach which concentrates on improvement in all areas. In the beginning, it was considered that the TQM concept is only for manufacturing firms. However, with the passage of time, this concept became equally important in the service sectors as well, such as banking, healthcare and related businesses. According to <u>Juran (2003)</u>, the implementation of TQM requires significant understanding of main elements, such as continuous improvement, leadership commitment, strategic planning and process control etc. which will facilitate the organization to improve the involved processes. Through TQM, firms modify their traditional culture and improve their processes so that they can make their products and processes superior (Inairat & AI-Kassem, 2014). TQM is a long-term strategy, for this reason, it aims to achieve long-term objectives. Therefore, it is also considered as a management philosophy to achieve quality sustainability.

The beginning of TQM is determined with the beginning of inspection which leads to quality control, followed by quality assurance, which ultimately results in TQM. After world war II, the reconstruction and production of civilian good became the top priority in Japan and the United States (US). Deming and Juran were the key notables who introduced quality control techniques to Japanese firms to rebuild infrastructure (Radford, 1997). The quality control techniques introduced by Deming and Juran included analytical tools which enabled individuals to investigate whether process is working as per the standards or not. They adopted a statistical quality control technique through which they used to observe the variations in processes, and examine whether the manufacturing process is in control or not. Such continuous monitoring leads to the development of quality control concept.

Deming's philosophy was concentrated on bringing improvements in product or service quality through minimizing variations. He believed that the variation in product or service is the principal reason for poor quality. As per <u>Deming (1986)</u>, around 80 to 90 percent of the variation occurs in production activities; the remaining 10 to 20 caused by special circumstances. Therefore, to achieve quality goals, the management should ensure that minimum variations are being occurred in the production processes. Moreover, the more service delivery mechanism is consistent, the more customer will be happy, resulting in enhanced organizational reputation. Deming also introduced a quality model which is also known as the Deming cycle. The details of that model are given in the next section.

Similar to Deming, Juran also believed that most issues related to quality are caused by management rather than employees. According to <u>Juran and Godfrey (1999)</u>, quality refers to fitness for use. To achieve the quality goal, <u>Juran and Godfrey (1993)</u> introduced three processes, namely plan, control and improve. Juran believed that managers can improve quality by working within the system familiar to them. He believed that in this way, firms can minimize the risk related to quality. <u>Crosby (1980)</u> related quality with conformance to customers' requirements. He introduced the term 'zero defect' and proposed that firms can excel in their operation by performing the job in the right manners from the first time.

2.2- Defining quality

As stated earlier, the rapid development to realize the importance of quality in different industries was mainly started in 1980 in the Western World and was caused by strong global competition which made the organizations concentrate on improvement in products and services (Deming, 1986). Organizations which efficiently implemented quality in their operations experienced improved financial performance. The concept of quality may be similar for all people at different levels. Quality can be context-depended

as well as context-free, depending on the situation. For this reason, authors, such as <u>Samson and Terziovski (1999)</u>, said that quality refers to the intrinsic characteristics of goods or services. Quality can be confined to the technical or professional definition from different stakeholders' perspectives.

Considering the importance of quality, and its benefit to organizations, a number of researchers and practitioners studied and defined quality from different angles. <u>Shewhwart (1931)</u> defined quality as an organizational ability to meet product or service requirement. From services industry perspectives, <u>Parasuraman, Zeitham, and Berry (1985)</u> stated that quality includes three characteristics, namely intangibility, inseparability and heterogeneity. <u>Bell, Brown, and Morris (1993)</u> proposed that quality is delighting customers by meeting or exceeding their demands and expectations. Ishikawa (1985) defined quality as "a mean to control cost, price, profit, and quantity of the product or service".

The American society for quality (ASQ) defined quality as "knowledge and skills for human welfare and development and the promotion of safety, security, and reliability standards of products for public use" (ASQ, 2018), hence quality can have two meanings; one, the characteristics of product or service should have the ability to satisfy stated or implied need; two, the product or service should be free of deficiencies.

2.3 - Defining TQM

The literature provides a number of view about the definition of TQM; however, there is no single or universal definition of TQM which can describe the complete picture (Hansson & Eriksson, 2002). The principal reason is different researchers view TQM from different perspectives and define TQM in that specific perspective. <u>Tari (2005)</u> said that TQM's definitions can be viewed from three perspectives, namely quality model perspective, quality gurus perspectives and empirical studies perspectives. This indicates that TQM's definition can vary from one industry to other industry, one sector to another sector and one author to another author. Dale, Wu, Zairi, Williams and van der Wiele (2001) termed TQM as an umbrella, which contains a variety of concepts and ideas from a different context, but specifically related to the quality domain. They defined TQM as "the cooperation of all people within the organization to produce

products and services having the ability to meet, or ideally exceed the expectations of the customers".

According to <u>Crosby (1984)</u>, "quality management is a systematic way which ensures that activities are happening as they have been planned". Quality management also prevents the creation of problems and control them with possible actions. According to Hellsten and Klefsjö (2000), TQM is a management system with three divisions, namely tools, techniques, and values. They defined TQM as "a management system which changes continuously, and consists of tools, techniques, and values, with the ultimate goal to increase the satisfaction of the customers using the minimum amount of resources". They further explained that TQM is a network of interdependent units which have the joint goal, this division equates the TQM definition proposed by Deming (Deming, 1986).

According to <u>Vouzas and Psychogios (2007)</u>, all literature related to the definition of TQM provides two dimensions, namely soft and hard elements. They further stated that hard elements represent management tools and techniques, while soft elements involve management principles and operational concepts. According to <u>Al Nofal, Al Omaim and Zairi (2005)</u>, the soft elements of TQM are intangible and hard to measure. Moreover, they are primarily associated with workers' involvement and leadership. However, the hard elements involve tools and techniques for internal efficiency external effectiveness.

2.4- TQM as a Management System

TQM is widely recognized as a system having the potential to strengthen the firm as well as individual performance. It also facilitates the organization in achieving a competitive advantage (A.A.A. Zwain et al., 2017). According to Al-Dhaafri et al., (2016), TQM not only has the potential to increase organizational profitability, but also significantly enhances customers' and employees' satisfaction. One of the key reasons for this tendency is that TQM practices aim for continuous improvement in all aspects. Because of its focus on continuous improvement TQM aim to provide greater customer value, boosted profitability, and productivity (C.-H. Wang et al., 2012). Quality management practices lead to competitive products or services, with superior quality and minimum cost and delivery time. These practices focus on the dignity of human, both customers and employees, and their satisfaction, and develop a loyalty between organization, employees, customers and stakeholders (McAdam & Leonard, 2003).

The concept of quality management has taken a lot of attention among the businesses during the last three decades. Although different businesses have different aims and objectives, however, the value of customers is vital in all fields. Similarly, the organizational ability to fulfil customers' requirements has fundamental importance to achieve long term success. The last two decades have proved the importance of quality management as an enabler of competitiveness and a valuable tool for achieving organizational goals. Because of operational and technological changes, the system for managing quality and control also has rapidly evolved. One of the indicators for this change is that steady increase in the adoption of quality standards, such as ISO 9000 by a large number of organizations across the world.

As the roots of TQM are predominantly established in the industry, a number of organizations take it as a management paradigm. Considering the advantages of TQM, in the beginning, it gained a lot of attention from profit-seeking organizations, such as banks, insurance companies, and manufacturing companies. With the passage of time, non-profit organizations, such as educational institutions and the health sector, also started adopting it. The models of TQM in manufacturing and services industries are based on the orientation of quality workers, involving the core elements of TQM, such as leadership, strategic planning, customer focus, continuous improvement, employees' participation, and related elements, required for the successful implementation of TQM and achieving organizational goals through it.

2.5- Trends in Quality Improvement Systems

The Japanese philosophers' contribution to the quality management system is indispensable to acknowledge. Quality gurus from Japan not only introduced the quality management and improvement techniques but also linked it with other management systems, such as knowledge management, so that it can be integrated with organizational principal business strategy. Different Japanese philosophers and practitioners focused on different aspects to improve quality. For instance, <u>Taguchi and</u> <u>Clausing (1990)</u> suggested that to improve the quality management system, firms must consider the design of product or process and include information about the

requirements of mature customers about the characteristics of product or service. In another study, <u>Taguchi (1999)</u> emphasized that firms must concentrate on the stages of product design so that a robust design can be developed which will have the ability to satisfy customers' needs. Taguchi believed that it will be easy for firms to make changes during the design process rather than the production process. By making changes during the design phase, firms can minimize the involved risk.

Shingo (1986) converted Crosby's 'zero defect' concept into zero quality control by emphasizing on the use of different quality tools to remove defects at the source level. His concept was further expanded by Ishikawa who developed a variety of statistical tools to solve quality problems (Ishikawa, 1990). Some of Ishikawa's popular statistical tools to solve quality issues are Ishikawa diagram and Pareto chart. The literature also provides arguments about involving employees in organizational processes and term it as a key element of TQM success. This led to the idea of the quality circle through which firms can sustain continuous improvement system. The quality circle comprises of a few employees who are expert in quality related issues. Although, a large number of people have described different views about TQM, a common argument which can be derived from their approaches is that TQM involves different practices, such as leadership commitment, strategic planning, workers' training to achieve quality, focusing on continuous improvement.

In the mid-nineteenth century, firms started shifting their emphasis from quality control to quality assurance. In the quality assurance system, firms used to pay more attention to pre-production activities, such as planning about how to remove error chances in each level of production. One of the principal arguments of quality assurance was that most of the poor-quality issues are linked with pre or earlier stages of production activities. Therefore, to ensure quality in product and service, firms must focus on preproduction activities. After the mid of nineteenth century, because of mass destruction caused by world war II, Japan started rebuilding by focusing on quality criteria mainly popularized by Deming and Juran. The Deming's approach to develop

and rebuild the infrastructure was very much attractive and helpful to the Japanese firms.

One of the key features in the Deming's and Juran's concept to prevent error was the empowerment of workers. According to <u>Deming (1986)</u> and <u>Juran and Godfrey (1993)</u> employees plays a critical role in the identification of the problem and its causes. Therefore, the management must consider their suggestions to counter the problem and causes of variations. With the expansion of quality scope, a number of issues were highlighted in the change process. For instance, one of the key issues in the quality assurance process was that early problem-solving teams were generated from the specific department and were specialized in a particular discipline. The production process involves a number of workers from different departments. Therefore, the pre-production team had little authority and knowhow about other departments, such as material, design, engineering, production etc. <u>Deming (1994)</u> investigated that the majority of errors are caused by the system and workers are responsible for the very least ratio of mistakes. The phenomenon leads to the development of quality assurance and accountability in a vertical manner within the organization. In the current era, it has extended to the external level by including supplier quality management.

2.6 - Approaches to Quality Management

The literature provides a number of different approaches related to TQM. Some of them have been explained below.

2.6.1 - The Deming Cycle

Deming was an American management consultant, statistician, and engineer. He is also believed to be the father of modern quality control mechanism. His theories are believed to provide the base for TQM and quality standards of ISO 9001. To ensure continuous improvement in the operations of the organization, Deming introduced the four stages, named as plan, do, check/study, and act (PDCA). In the literature, it is known as the Deming cycle. The Deming cycle, also known as PDCA, is a unique model to ensure continuous improvement in the quality of product or service, through the sequence of four logical repetitive steps, namely plan, do, check (in some literature

study), and act. Deming believed that the sources of variation in the operation of the business should be identified and analysed. According to Deming, the variation in the quality of product or service leads a difference in customers' requirements and product's or service's performance. The PDCA cycle has no end, and, to ensure continuous improvement in the processes, these steps should be repeated again and again.

The Deming's PDCA approach not only can act as a mechanism for solving the problem but also can be taken as an embodiment for continuous improvement. Therefore, it not only can be for large processes improvements, but the value of small processes can also be improved through it. The Deming' model can be implemented to enhance the effectiveness, quality, and performance of processes, involved in the product lifecycle, human resource management, project management, supply chain management, and related areas of business. According to <u>ASQ (2018)</u>, the PDCA can be used in the following circumstances;

- To improve the quality of the product or service
- On the start of the new improvement plan
- On introducing and putting into practice any change
- To develop the new design of the product, process, or service
- To collect data for the identification of prioritizing problem and their principal reasons



Figure 1: Evolution of Scientific Methods and Deming Cycle (Moen, 2010)

The focus of Deming's approach was on production processes in the manufacturing and services industries. Whenever he talked about the improvement, he referred to the improvement in production processes. In today's modern and highly competitive business environment, to successfully compete in the industry, organizations strongly need to follow Deming's principles and improve their operations according to his guidelines. However, it is vital to align the improvement strategy with business strategy since the actual performance is driven by the business strategy. The execution of strategy is a more complex process and believed to have variation in the longer term. Particularly in larger companies, considering their scale of operations, their strategies cannot be changed within a shorter period of time. Following are the components of the Deming cycle;

- Plan: In the planning phase, organizations have to identify the problem. For example, the assessment of the current or new process, the identification of tools and techniques to improve it, such as data collection to determine the root causes of the problem. Organizations have to establish what kind of results they want. Implementing change without planning can result in a disaster for the company. The management should be able to analyse and predict potential outcomes. Considering the scale of operations, during the planning phase, it is recommended to map minute changes. The purpose is that small changes are easy to manage and, the desired objectives can be achieved through continuous monitoring of the operations.
- **Do:** This is the implementation stage of what an organization has planned. Plans are executed here in a controlled environment and in step by step. To assess the effectiveness of the planned implementation, the changes are measured by taking data.
- Check/Study: The focus of check/study stage is on checking the results of the applied change and making a comparison between previous performance and the new one. The comparison of results is shared with the management, responsible for planning. In this phase, the process is also evaluated to investigate any differences from the base test.

 Act: Considering the outcomes of the check/study phase, actions are taken in this phase to either further improve the process, or standardize the change. If the results are as per the expectation, the introduced change becomes the standard for the workers, such as how to act. On the other side, if the results are below the expectations, the organization keeps on going with the existing standards. The management should decide about the changes required to further improve the process.

Mostly, the concept of continuous improvement is popular in large organizations. The fundamental reason for this is the availability of resources. Small organizations face a shortage of financial and technical resources, which obstruct their efforts for continuous improvement. However, in small organizations, the employees have more sense of overall profitability of the firm, and they are more committed to improving it since it will have a direct impact on them.



Figure 2: The Deming Cycle (Deming, 1994)

2.6.2 - Kaizen Cycle for Continuous Improvement

Kaizen is an operational approach to bring continuous improvement in all functions by involving employees from all levels. This approach is applicable to all sectors, such as production, purchasing, logistics, supply chain etc. and all industries, such as medical, banking, services and manufacturing firms. Kaizen approach proposes that through small and ongoing improvements, firms can make significant improvements. It also concentrates on eliminating or minimizing waste. Kaizen approach is a fundamental element of lean manufacturing philosophy. It is also a complementary component of six-sigma. A number of approaches are used in Kaizen, such as TQM and value stream mapping. Kaizen involves a number of key principles, such as initiating with assumptions, solving problems by becoming proactive, becoming flexible, working to become perfect, identification of mistakes and finding solutions for them, employee empowerment, identify the root causes of obvious issues, taking input from different people, encourage individual and group creative activities for minor improvements and make improvement activities as continuous process.



Figure 3: Kaizen cycle for continuous improvement. Extracted from Rouse (2018) The Kaizen cycle includes seven steps, details of which have been given below
- Employees involvement: One of the key principles of Kaizen cycle is to involve employees in activities related to problem identification and decision-making processes.
- Identification of problems: Kaizen aims to improve organizational processes on a continuous basis. Therefore, by involving different peoples, different areas of improvement and issues are identified and possible solutions are proposed. In case of multiple issues, a short list is created with arranging the priorities.
- **Proposing solutions:** The identified problems are analysed by involving different employees and solutions are proposed. All the possible solutions are evaluated and the most suitable one is picked.
- **Testing the solution:** The ideal solution, picked in the last stage, is applied by involving all relevant persons. At this level, this solution is applied as a pilot test or at a small level.
- Evaluation of results: The results of the applied solution are evaluated at different levels and progress is analysed on a continuous basis. It is also determined how well the new solution has performed and what are the changes in the results.
- Standardization: If the results of the applied solution are as per the expectations, firms should adopt the new solution at the organizational level. If the results are not as per the expectations, possible causes are identified or the second most suitable solution is tested.
- **Repetition:** To ensure continuous improvement in operations, these steps should be repeated on an ongoing basis. Firms should identify the areas warranting improvements and apply new solutions.

2.6.3 - Six-Sigma

In 1986, the term six-sigma was introduced by Bill Smith and Bob Galvin using the Motorola platform as its trademark. The aim of this technique was to minimize the defect rate so that its ratio become insignificant. Sigma is a statistical term which is used for standard deviation in the statistical calculation. The proponents of six-sigma argue that

quality should be analysed from customers' perspectives. In the six-sigma phenomenon, firms analyse the relationship between six standard deviations between the ideal specification and the error, deviating the system (Rawson, Kannan, & Furman, 2016). The concept of six-sigma includes five stages, namely define, measure, analyse, improve and control. In the define stage, firms identify the problem and state the objectives and priorities to solve it. In the second stage, firms understand the processes to solve the problem, validate the accuracy of data and determine the capabilities of processes. In this stage, firms also quantify the problem so that it can be measured. In the third stage, the firm analyses the causes of issues, validates the vital few, and investigates the cause and effect relationship. In the improvement stage, firms implement the possible solutions so that root causes of anomalies can be removed. Firms also investigate the results of possible solutions and execute plans for future processes. In the control stage, organizations establish the standard measures and procedures and make the adjustments wherever required. Moreover, to control the errors, periodical review of performance is conducted.



Figure 4: Sig-sigma approach extracted from Hahn, Hill, Hoerl and Zinkgraf (1999)

2.6.4 - International Organization for Standardization (ISO)

The International Organization for Standardization (ISO) refers to a sovereign institution having more than one hundred-and-fifty-nine-members countries that coordinate to design quality standards. ISO has a number of series and 9000 relates to quality management and includes some of the best-known standards. The ISO 9000 series aims to provide confidence to customers and suppliers that their management processes are consistent and complies with their requirements. It also provides guidelines to companies who want their products and services should have excellent quality (Youssef, 2006). The ISO 9001 includes eight principles for quality management standards, namely leadership, customer focus, employee involvement, continuous improvement. process management. system support management. supplier management and strategic decision making. These principles of ISO are similar to other quality management concepts, such as MBNQA and EFQM. The ISO certification received valuable attention in 1990s. During this period, some countries also instituted different quality awards (Fisher & Nair, 2009), which later were replaced by "Business Excellence Award". The ISO 9001 standards are equally important for small, medium and large firms regardless of their industry. As per ISO (2018), there are more than one million ISO certified firms in over 170 countries.

2.6.5 - Lean Manufacturing

Lean manufacturing, also known as lean production is systematic to eliminate or minimize waste from manufacturing activities. Waste is something which does not add value to product or service from the customers' perspective. Lean manufacturing also considers the overburden and unevenness aspects in workload. Every organization has a huge potential to grow and improve its performance through lean manufacturing technique. Through lean manufacturing, firms attempt to add value to their products and processes by minimizing elements which don't add value. The concept of lean manufacturing is mainly derived from the "Toyota Production System". The engineers of the Toyota company introduced this concept by combining the Deming's and Taylor's quality management principles with the Ford company's workflow in the 1990s. To ensure ideal lean manufacturing system, firms should make it certain that they have a

simple manufacturing system, identify the room for improvement, and take measures to improve the manufacturing design.



Figure 5: Lean manufacturing, extracted from EPA (2003)

2.7 - Advantages of Quality Management Approaches

The advantages of TQM refer to benefits generated as the results of the successful implementation of TQM in the organization. Firms can estimate the advantages of TQM through different techniques. One of the popular approaches to assessing TQM's advantage is the evaluation of the cost of poor quality (Juran, 1986). It is clear from the above discussion that the key benefit of TQM is to improve organizational performance by minimizing cost and maximizing quality. The literature also indicates that the successful implementation of TQM system results in enhanced satisfaction of customers.

Because of TQM's customer's focus orientation, employees are expected to provide the best possible services to customers. They are also expected to offer better quality products at a lower cost. This enhances their trust in the organization and makes them a loyal customer, resulting in enhanced market share of the firm. TQM also involves continuous improvement of processes. This is done through top management's commitment, employees' involvement and empowerment and effective strategic planning. Through continuous improvement, firms aim to reduce their operational and fixed cost, and focus on getting maximum out from minimum resources. This leads to enhanced organizational productivity, efficiency, effectiveness and competitiveness.

2.8 – TQM Core Values and Models

The core values or the principles of TQM are the characteristics which formulate its base, known as a value-based system. According to Hellsten and Klefsjö (2000), TQM consists of a number of values, for example, customer focus, employees' commitments, process focus etc. To make sure that organization fully benefit from these values, it must be supported by techniques, such as strategic planning, process management, control charts etc.



Figure 6: Values, tools, and techniques of TQM (Hellsten & Klefsjö, 2000)

It is imperative to assess the values which guide the system of quality management. In this regard, Pareto principles also provide valuable guidelines. According to the Pareto approach, organizations should select and focus on the most effective elements and values which have the potential to deliver close to the maximum possible. For example, organizations should focus on twenty percent of the elements

which have the potential to produce eighty percent of the total. The foundation of Pareto arguments is that a small number of commonly agreed values should be enough to make clear the core constructs of TQM. Another argument of the Pareto principle is that in contrast to whole values, it is easy to work and focus on limited values.

With the realization of the importance of quality management and quality control concepts, dynamic firms started following self-assessment approach to measure performance. The self-assessment approach enables firms to develop a balance between their priorities and allocate natural and human resources by developing suitable plans. This approach relies on honesty and knowledge so that a culture of excellence can be promoted. To ensure self-assessment, different organizations develop different business models known as business excellence models (BEM). The three most popular BEMs are European Foundation for Quality Management (EFQM), the Malcolm Baldrige National Quality Award (MBNQA), the Swedish Institute for Quality (SIQ). These awards include a number of values related to social responsibility, peer-learning, future generation concerns etc.

2.8.1 – The European Foundation for Quality Management

The European Foundation for Quality Management (EFQM) award is one of the popular tools to evaluate the performance of a firm in internal as well as external modes. The EFQM is a non-profit organization which was established in 1989 to enhance the competitiveness of the European firms and its economy (EFQM, 2003). The EFQM was mainly formed in a response to the quality concept by Edward Deming and the popularization of TQM phenomenon. At the beginning of the EFQM establishment, sixty-seven companies became its members. In 1992, a group of experts from different sectors, such as educational institutions and industrialists, designed the first version of the EFQM Excellence Model. According to <u>EFQM (2013)</u>, the set of European values provides the foundation for the EFQM Excellence award. Considering the important role of the business community, the United Nations (UN) established an institution, named as United Nation Global Compact (UNGC, 2000). The UNGC outlined ten principles for smooth business operations, such as human rights, forced labour and

bribery, corruption etc. The UNGC principles are strongly related to the EFQM business excellence model.

The EFQM believes that there are eight concepts which are fundamental for business excellence, namely value-added service for customers, development of sustainable future, enhancing the capabilities of organization, promoting innovation and creativity, leading with inspiration, vision and creativity, managing business with agility, capitalizing on human resource to enhance organizational performance, and ensuring the sustainability in outstanding results. The EFQM business excellence award includes nine elements which are divided into two sections, namely enabler and results. In the enabler section, components, such as leadership, strategy, people, partnership and resources and processes, products and services are placed. While in the result section, four elements, namely people result, customer results, society results and business results are located.

The enabler section represents organizational capabilities to do something, while the results section represents what an organization actually do. According to <u>EFQM</u> (2013), enabler provides the foundation for results, and the firm improves the enabler through the feedback generated from results. The arrow presented at the outer edges of the model represents the dynamic nature of the EFQM award. Through learning, innovation and creativity, firms improve the enablers which facilitate the improvement of results.



Figure 7: The European Foundation for Quality Management Business Excellence Model (Extracted from (EFQM, 2013)

2.8.2 – The Swedish Award for Performance Excellence

The Swedish Institute for Quality (SIQ) is a national institution that aims to facilitate businesses to achieve excellence in Sweden. With the support of the Swedish Government and relevant association members, the SIQ was established in 1990. According to <u>SIQ (2019)</u>, currently there are more than one hundred companies and institutions associated with SIQ. The SIQ aims to promote quality by creating new knowledge, acquiring available knowledge, and sharing it to others so that organizational excellence can be achieved. The SIQ facilitates all types of organizations to improve their processes and learn from others. A number of activities are performed by the SIQ, such as research and development (R&D) activities, educational development, quality suggestion and award.

Being the national institute of Sweden, the SIQ has developed a performance excellence model, namely "SIQ Model for Performance Excellence" (SIQ, 2019). This model has become a fundamental philosophy for different types of businesses with respect to monitoring and evaluating their performance. The SIQ performance excellence model has two categories. The first is for small and medium firms with less than two hundred employees; the second category is for large firms having two hundred or more employees.



Figure 8: The work process of SIQ Performance Excellence Model (Extracted form Quist, Ska°le´n and Clegg, (2007))

2.8.3 – The Malcolm Baldrige National Quality Award (MBNQA)

The Malcolm Baldridge National Quality Award (MBNQA) is an American quality award which was established in 1987 by the US Congress. This award was established with the aim to promote quality management awareness among US firms and recognize those organizations that have successfully implemented it in their operations. This award is named after the US Secretary of Commerce Mr Malcolm Baldrige, who was a major proponent and supporter of quality management practices in firms. The MBNQA is the highest presidential honour award issues by the US government to acknowledge the firm's excellence. Each year, the US government gives three MBNQA awards in six different categories, namely manufacturing, services, non-profit organizations, small business, healthcare and education sector (MBNQA, 2019). In 1999, healthcare and education were added in the MBNQA award, while non-profit and the government categories were added in 2007.

The Baldridge quality framework is divided into three sections: the first part relates to the criteria for achieving excellence in performance, the second section includes a variety of core values and concepts which facilitate firms to achieve excellence, the final section includes a guideline for scoring. The Baldridge framework not only aims to help organizations to improve their performance by identifying their strengths and improvement opportunities, but also make the award recipient as the role models for other firms. Firms that apply MBNQA principles are evaluated by independent members on seven criteria, namely leadership, strategy, customer, measurement and analysis, workforce and operations. The MBNQA model contains 12.5% of the total points related to governance, environmental and social responsibility issues. This model has a valuable focus on employees and other stakeholders. The other quality awards, such as SIQ and EFQM also have a comparable level of focus on corporate social responsibility (CSR). From the stakeholders' perspective, the BEM proposes an effective initiation for SD. To achieve a better balance on TBL, the BEM further needs to be modified.



Figure 9: Baldridge Excellence Framework (Extracted from NIST (2019))

Table 1: MBNQA	Model with	SD	Content
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Principal category and points	Sub-category and point					
Leadership, 120 point	Organizational leadership, 70					
	Social responsibility initiatives, 50					
Strategic planning, 85 points	Development of strategy, 40 points					
	Implementation of strategy, 45 points					
Customer focus, 85 points	Knowledge of customers and market, 40 points					
	Customers relationship, 45 points					
Information and analysis, 90 points	Information and analysis of organizational					
	performance, 45					
	Information management, 45 points					
Human resource management, 85	85 System of work, 35 point					
points	Employees motivation and learning, 25 points					
	Employees development and satisfaction, 25 points					
Process management, 85 points	Process of value creation, 50 points					
	Support process, 35 points					
Business results, 450	Customer focused result, 75					
	Product and service result, 75					
	The financial market result, 75					

Human resource result, 75 Organizational effectiveness result, 75 Governance and social responsibility result, 75

Table 2:	Com	oarison	of c	auality	dime	nsions	given	in	different	framework	S
				1			3				_

MBNQA	EFQM	SIQ	ISO 9000-2000
Leadership	Leadership	Leadership	Leadership
Strategic planning	Strategy	Continuous	Continuous
		improvement	improvement
	Partners	Partnership	Supplier management
Customer focus	People Focus	Customer orientation	Customer focus
Process management	Process, products,	Process orientation	Process approach
	and service		
	management		
Human resource		Participation by all	People involvement
management			
Information and analysis			Factual approach to
			decision making
End results	People, customers,		
	society, and key		
	performance results		
		Learning from others	
		Competence	
		development	
			System approach to
			management

2.9 - TQM from Manufacturing to Service Industries

As mentioned in earlier sections, the quality concept was started from manufacturing industries. However, with the passage of time, the service industries also realized its importance and started adopting quality management practices. However, the rate of growth of quality management in service industries was slower than the manufacturing industries. Similar to manufacturing industries, in service industries, the initial concept of quality was focused on quality control and quality assurance. A number of services firms started considering the customer relationship as the key factor for quality. This made firms to concentrate on the training of staff directly engage with customers. With the introduction of the quality concept in the service industries, the term 'service quality' became popular not only in-service industries but also in the manufacturing companies. For this reason, the volume of research on service quality is constantly increasing.

Manufacturing and service industries have significant differences. According to <u>Ooi</u> (<u>2014</u>), manufacturing firms manufacture the goods and then deliver it. However, in services industries this phenomenon is instant. This means that services are delivered and consumed at the same time. Considering the changes in the nature of both industries operations, during the last three decades, a number of alternative models of quality have been conceptualized for services firms. Such service quality models specifically concentrate on service industries' operational concept, design, implementation and evaluation of quality aspects. Some researchers also proposed methods to evaluate quality in service industries. For instance, <u>Parasuraman, Zeitham, and Berry (1988</u>) introduced a famous SERVQUAL model which specifically concentrates on measuring the quality of services offered by firms. However, most of the work related to quality model in service industries are at the beginning level.

According to <u>Chase and Bowen (1991)</u>, there are three theories that provide guidelines to develop a model of quality for service industries, namely attribute theory, customer satisfaction theory and interaction theory. The attribute theory states that service quality mainly depends on the service-delivery system's attributes. In this regard, the management has significant control over processes ensuring quality. The theory of customer satisfaction proposes a totally different view. This theory proposes that service quality should be viewed from the customers' perspective. A firm should know about the needs and wants of customers, and evaluate whether their provided services have fulfilled customers' needs or not? The mismatch between customers' expectations and actual delivery indicates poor quality performance. In customer satisfaction model, the excellence in service level does not determine the quality, but it is the congruence between customers' anticipation about service and the actually

received service. The interaction theory is the third approach which concentrates on developing interaction between customers and employees and advocates co-production techniques. This theory states that firms should adopt the input-output model by involving customers' opinions.

2.10 – Core Constructs of TQM

The review of literature presents a number of studies that have identified different variables related to TQM. <u>Tari (2005)</u> presented these variables from three perspectives, namely quality gurus, quality models and empirical studies. Most of the literature related to the core constructs of TQM focuses on the contribution made by TQM gurus, such as Deming, Juran and Crosby. Therefore, in this section, some of the core elements of TQM are discussed. Different studies focused on TQM indicates that the core constructs of TQM have been mentioned using conceptual as well as empirical stuff. As discussed earlier, there are a number of quality models and awards which act as a guideline for successful implementation of TQM. Some of the most popular awards are Malcolm Baldridge National Quality Award (MBNQA), the Swedish Institute of Quality award, the International Standardization Organization (ISO) 9000 and the European Foundation for Quality Management (EFQM) award.

It has been mentioned in the introduction section that the current study uses the Malcolm Baldridge award to analyse the relationship between corporate sustainable development and knowledge management. Principally, the MBNQA model has seven contracts, namely leadership, strategic planning, human resource management, process management, customer focus and information and analysis, which are further divided into seventeen sub-sections. The EFQM model includes nine elements divided into two groups, namely enablers and results sections. The enabler section contains five elements, namely leadership, people, policy and strategy, partnership and resources and processes, which focuses on the methods of things happening in the organization. The results section contains four elements, namely customer results, society results, people results and performance results, and represents the enabler section's achievement.

If an organization implements quality constructs throughout all the levels the success of TQM is definite (Bou & Beltrán, 2005). The ISO 9000 standards constitute eight principles related to quality management, that is leadership, customer focus, people involvement, strategic decision making, process focus approach, strategic management, focus on continuous improvement and supplier relationship management (ISO, 2018). The systematic and strategic use of these elements can significantly enable the organization to improve its performance.

The contribution by TQM gurus to the concepts and theory of quality management has greatly enhanced people's knowledge and understanding about the quality and TQM core constructs. The term core constructs refer to principal dimensions or essential values critical for the success of TQM. The analysis of definitions of TQM indicates TQM mainly focuses on two areas, that is what and how. The component of 'what' is given in almost all the definition and studies. The 'how' component of TQM differentiate TQM from other quality programs and initiatives and focuses on the core constructs of TQM (Vouzas & Psychogios, 2007).

As a holistic approach, TQM is believed to be an effective management system that has great potential to improve organizational performance by considering different elements (Cetindere, Duran, & Yetisen, 2015). Considering these facts, a number of researchers have conducted studies to identify the relationship between different constructs of TQM, such as <u>Zwain, Teong and Othman (2011)</u>, <u>Sila (2007)</u>, <u>Hsu and Shen (2005)</u> and <u>Hellsten and Klefsjö (2000)</u>. Almost all of these studies believe that TQM is a holistic approach and all practices must be applied simultaneously as they are interrelated and support each other.

2.10.1 – Leadership

The top management of the organization should ensure their active participation in activities related to quality assurance. The leadership commitment is among the most crucial elements for the success of TQM. The top management commitment acts as a guideline and aspiration for employees in the organization. According to <u>Deming (1986)</u> and <u>Crosby (1980)</u>, the implementation and success of TQM start from the commitment

of the top management. If the leadership is not actively participating in a quality management program and, if their actions do not explicit their commitments with the quality, this can drastically impact on the success of TQM activities. The success of TQM program requires the continuous involvement of the management.

Taking into account the importance of leadership, <u>Motwani (2001)</u> and <u>Abbas</u>, <u>Muzaffar, Shoaib Mahmood (2014)</u> proposed that firms should visualize TQM as building a new house, and put leadership commitment at the foundation of the new house. He termed other TQM elements as pillars for the house. <u>Santos-Vijande and Alvarez-Gonzalez (2007)</u> said the top management should focus on improving organizational performance by increasing its overall quality and output. <u>Kanji (2000)</u> said that leadership should vigorously focus on creating and promoting the quality culture and share their vision throughout the organization.

In Hansson (2003) view, the leadership has the strength to manage the resources by stimulating individual values, working systematically with tools and techniques, and supporting quality activities which support the core values. To ensure the successful implementation of TQM and getting maximum benefits from it, the top management must demonstrate its commitment to it. They should be involved in designing the strategy, its implementation, and evaluate its processes and results on a regular basis. It is imperative for the management to clarify quality values and goals. In this regard, the line managers have critical importance.

The junior and middle managers act as the role models for others within the organization. They enforce the quality values within the organization by following suitable tools and techniques. The effective management of human resource can act as a mean to develop a competitive advantage for the organizations. Waddell and Stewart (2008) mentioned leadership as a key component of TQM for employees motivation. They consider employees as the key resource of the company and promote mutual success by enabling them to relate their personal goals to organizational goals (Fotopoulos & Psomas, 2010).

In the context of quality, leaders should take initiative to ensure quality in processes and products. They should take necessary actions to implement the quality program. In the sustainability context, leaders have to consider natural resources, the impact of their operations on the society and the firm's role in society's development. Some researchers, such as <u>Kanji and Moura (2001)</u> and <u>Landon (2003)</u> recommended that the practices of TQM must follow from top management to lower employees. They also argued for developing a long-term relationship with customers, suppliers, employees and other stakeholders. <u>Townsend and Gebhardt (2002)</u> understood that leadership commitment to TQM is essential since firms cannot achieve TQM goals without their involvement. Moreover, it is also considered the foundational block for different quality models, such as MBNQA, EFQM and ISO 9000.

2.10.2 – Strategic Planning

The strategy is one of the enablers of TQM and has a significant impact on quality management and implementation activities. It is believed to be the second most important element for the success of TQM (Cascella, 2002). All the models of TQM, such as MBNQA, EFQM and ISO 9000 highlight the importance of planning and strategy to achieve quality goals. Quality gurus, such as <u>Deming (1986)</u>, <u>Juran (1986)</u> and <u>Crosby (1980)</u> also termed strategic planning as the most critical element for the success of TQM program. Dynamic organizations continuously review and modify their strategies as per the market trends (Oakland, 2011).

According to <u>Evans and Dean (2003)</u>, strategic planning refers to processes involving organizational leaders to design organizational objectives and plans about its future activities, defining procedures and set operational actions to achieve those objectives. In this perspective, it can be indicated that strategic planning refers to a set of actions which a firm takes to achieve its long-term objectives. In the view of <u>George</u> and <u>Weimerskirch (1998)</u>, strategic planning refers to organizational designs, modules, guidelines and development structures that focus on achieving customers satisfaction. Strategic planning refers to organizational plans to achieve specific objectives, such as quality and sustainability goals.

Organizational strategies have a direct impact on different stakeholders, such as employees, customers, partners and suppliers. Therefore, dynamic organizations develop their strategies by considering internal as well as external stakeholders. They link their vision and mission statements with stakeholders' interests. Considering the highly competitive business environment and increasing customers' expectations, modern firms link their prime strategy with multiple subsequent strategies. However, all such strategies aim to fulfil customers' needs and consider other stakeholders' interests.

Landon (2003) anticipated that strategic planning leads to organizational success in a highly competitive market situation. Moreover, it also has a positive relationship with realizing organizational objectives. According to Lee, Ooi, Sohal and Chong (2012), planning is a synoptic activity and not the incremental one. This means that firms need to develop plans for all departments and at all levels which are ultimately linked with overall business strategy. Considering the complexity of business operations, TQM models include forward as well as backward integration. In the early development phases, the focus was only on forwarding integration as the top management was concentrating on quality development. With the passage of time, the volume of organizational stakeholders increased, such as the requirements of external customers, supplier management etc. This led to further development of quality planning and including backwards-integration in the quality management program.

2.10.3 - Customer focus

Customer focus is one of the core values of TQM and has central importance in TQM. This is because that irrespective of the nature of the business, such as manufacturing or services, to successfully compete in the industry, all organizations must concentrate on customer satisfaction (Lu, Berchoux, Marek, & Chen, 2015). This element of TQM concentrates on taking information about customers' needs so that improvements can be made to achieve their satisfaction. This activity will lead to enhanced organizational performance.

It is generally believed that the quality of product and service should be valued from the customers' perspective. Similarly, it should also be put with respect to customers' expectations and needs (Bergman & Klefsjö, 2003). Considering this point of view, it can be levied that quality is a relative concept and vary from market to market, person to person, and product to product. However, it is essential that the organization ensure its dedication to satisfying customers' needs as this is not an easy and short-term activity. To ensure customers' satisfaction with quality, the organizations must design their strategy in the long-term perspective, with continuous evaluation.

Considering the customer focus aspect of TQM, <u>Crosby (1980)</u> emphasized that quality is conformance to customers' requirements. By focusing on customers, firms determine their long- and short-term objectives and develop strategies to achieve those objectives. According to <u>Zink (2007)</u>, it is commonly believed that TQM aims to, and have the ability to, meet customers' needs and expectations. The ISO approach also focuses on understanding and complying with customers' expectations. For this purpose, firms have to evaluate quality processes at regular intervals. Earlier, the customer focus criteria were just concentrated on organizational customers. However, in the present era, organizations have to consider not only direct customers but also other stakeholders, such as society and the environment (Ingenbleek & Dentoni, 2016). Considering the sustainable development element, organizations have to consider present as well as future generation's needs. This shift from customers to stakeholders has led to the inclusion of a number of other groups. This has also led to the introduction of corporate social responsibility (CSR) term.

There are a number of studies which states that if a firm wants to excel in the market, they have to focus on their customers and should not treat them levity. For example, <u>Taylor and Wright (2003)</u> stated that to ensure the success of TQM, firms must understand their customers' needs. <u>Rampersad (2001)</u> put forward that all the employees within the firm should focus on their customers and facilitate their firm to keep their database so that the top management can understand customers' needs and develop their strategies, accordingly.

2.10.4 – Process management

All firms around the world follow specific processes to perform their operations. Process management is one of the key components of TQM, and firms following TQM system place special focus on it. The literature provides different definitions of process management varying from one domain to another. However, basic concepts are related. The process is an interlinked repetitive activity, which converts the input into output and adds value for a customer.

Egnell (1996) defined process management as "a systematic method to organize, manage, and continuously improve the organizational processes". According to <u>Harrington (1995)</u>, process is a combination of activities which accepts input, work on it to add value and convert it into an output so that it can be used by external customers. Firms need a number of resources to process input so that it can be converted into output. In the view of <u>Rummler, Ramias and Rummler (2009</u>), a process refers to a chain of activities aims to add value to the organizational products or services. Considering the above literature related to process management, it can be summarized that process management is a group of activities having a specific beginning and end. Moreover, the process is a repetitive action in nature which aims to satisfy customers' needs.

The aim of process management is to ensure that all activities are done in effective and efficient manners. At the same time, process management aims to produce the products and services having the ability to satisfy the needs of customers. However, the primary target in process management is not the result, but the means through which the results are generated. Therefore, the end result, such as customer satisfaction, is a dependent variable in this case, since the result is derived from the process. The data, related to the performance of the product and customers' satisfaction with it, is generated from the process. For example, a complaint by the customer about the design of the product or the processing time of a particular service highlights the problem in the process. The customers' feedback can help the organization to remove the anomalies in the process and design the products or services which are more customers friendly.

Isaksson (2004) mentioned that the process management deployment has remained slower, even in industrialized countries as well. Investigating the level of process management in small and medium-sized enterprises (SMEs) in Sweden, Garvare (2002) said that only 10% of SMEs operating in Sweden have introduced process management concept in their organizations. Although, the level of process management deployment in large organizations, particularly located in highly developed countries, is higher, however, it is a fact that most of the organizations in the world, especially in the developing countries, have not implemented process management principles in right manners, specifically by focusing on TBL and organizational operational and financial performance.

Since the small organizations have relatively less complex management hierarchy, they have a natural propensity for training their employees in cross-functional manners (Ghobadian & Galler, 1996). Similarly, as compared to large organizations, the workers in small organizations have more know-how about the processes, and how their operations are related to the production of the final product or service. Irrespective of organizational size, the leadership of the firms must support process-oriented actions. Considering the large-scale operation, the bigger firms delegate this responsibility to line managers. In comparison to small organizations, large organizations have more resources. Therefore, they tend to educate their employees on the efficient utilization of resources. The transfer of knowledge, in the form of training and development is critical for efficient process management (Al-Alawi, Al-Marzooqi, & Mohammed, 2007).

2.10.5 – Human Resource Management

Organizations cannot achieve quality in their products or services through the commitment of a few persons. To do so, all employees have to play their role. Through human resource management (HRM), dynamic firms ensure the participation of their employees in designing policies, identifying problems and proposing solutions. Moreover, employees' participation in organizational strategies also greatly improve their motivation and commitment levels which greatly impact on quality management.

Employees can become aware of their important role in the development of the organization through training and development. They have direct relationships with customers. Therefore, their training and development are essential to ensure effective customer service. Training and education provide the required knowledge to employees related to achieving the mission, vision, and objectives of the organization. It also sharpens the skills of employees required to address the operational issues and improve the quality. Bergman and Klefsjö (2003) termed information, training, and education as an essential element for encouraging employees for their participation and commitment to achieving organizational objectives.

Organizations which belief in employees' participation and commitment have more potential for success. Considering the feedback from the employees, dynamic and learning organizations readily implement changes to improve the organizational overall performance. This not only motivates employees for active participation in the operations of the firm, but also makes them keep the interest of the organization at the heart. In large organizations, as the responsibilities are delegated at a different level, they have more tendencies to get feedback from the employees. However, in small organizations, there is a risk of the owner or top executives' dominance in organizational culture.

Dynamic organizations consider employees as their most valuable resource (Oakland, 2011) and create a culture of mutual benefits by linking individual goals with organizational and their achievement (EFQM, 2010). Employees should thoroughly be involved in organizational activities to achieve the highest level of performance. In the view of <u>Crosby (1980)</u>, this can be done in two ways, that is employee empowerment and their participation. <u>Deming (1986)</u> and <u>Crosby (1980)</u> also mentioned employees participation and empowerment as the basis of the TQM system.

<u>According to Pun, Chin and Gill (2001)</u>, employee empowerment refers to workers' feelings about authority and responsibility to play its role to solve problems and propose viable solutions. The top management of firms should ensure the participation of junior management or supervisor level persons by delegating different responsibilities to them. <u>Morgan and Murgatroyd (1997)</u> studied that employees' participation in organizational

activities as the key constructs of TQM which leads to quality improvement level. <u>Geralis and Terziovski (2003)</u> said that through employees empowerment, firms delegate control and responsibility to lower levels employees by ensuring the availability of required resources and tools to perform their activities and benefit the organization. <u>Santos-Vijande and Alvarez-Gonzalez (2007)</u> said that employees commitment to organizational TQM practices governs their participation in organizational affairs. <u>Plsek (2000)</u> argued that employee empowerment and involvement encourage them to become creative and propose constructive opinion. This will enable the management to get the maximum from their employees.

2.10.6 – Information and analysis

One of the important values of TQM is the information and its analysis. On the basis of the information, the management develops its strategies and takes a decision. Information and knowledge-based decisions not only enables the organization to cope with the problems, but also helps them to dominate others as well. Through information and knowledge-based decision, organizations can avoid the fluctuation and uncertainty in their operations. According to Hansson (2003), one of the key reasons for the failure of the new or existing business is the lack of knowledge about the market and operations. This fact indicates that the processes related to production should be related to the present and future needs of customers, and their experience with the existing products. Organizations can obtain information from the customers through different means, such as market survey, their feedback, analysing the position of the market.

As per the different proponents of TQM, the very first stage for performance improvement is to know the present performance level so that it can be improved as per organization strategy. By knowing the current position of the firm will help them to compare or measure the improvements made by TQM. For this reason, the information which needs to be shared with employees should be fact-based (Al Nofal et al., 2005). In general, quality standards refer to strong and measurable performance goals (Bayraktar, Tatoglu, & Zaim, 2008). By considering the customers' feedback, the

organizations should compare the need of the customers with the performance of the products. Considering both areas, they should design the strategies and future plans of actions.

In order to achieve enhanced performance, firms must ensure continuous improvement activities in all areas of the operations. For this purpose, they must have not only the internal information about their activities, but they also should be aware of customers' need, suppliers' requirements and all other stakeholders. In this regard, information and analysis play a critical role. Information and analysis are one of the core components of TQM in <u>Kanji and Tambi (1998)</u> pyramid. Firms can achieve efficiency through leadership commitment and goal-oriented decisions which should be based on facts and information (G. Kanji & Moura, 2001). For this reason, fact-based decision making and information and analysis are considered as another core element of TQM.

An accurate and comprehensive information system helps managers to get the latest and accurate information about their operations and design their strategy, accordingly (MBNQA, 2004). Considering the importance of information and data, firms need a number of information from different perspectives. For instance, there are a number of firms which consider their operation from a gender perspective, age-wise, region-wise etc. Detailed information about the operation of these organizations and customers' feedback about the performance of firms can help the management to revise their strategy and consider their stakeholders' interest.

CHAPTER 3

REVIEW OF LITERATURE – SUSTAINABLE DEVELOPMENT

3.1 - Introduction and Background

A number of studies term sustainability as a recent concept, however, the review of history indicates that sustainability and environmental concerns were initiated with the launch of the modern environmental movement. The literature on sustainability started publishing in late 1970s. <u>Pirages (1977)</u> and <u>Hayes (1978)</u> are considered as a pioneer to outline literature on a sustainable society. Later, a number of scholars, such as <u>Brown (1981)</u>, <u>Cleveland (1981)</u> and <u>Coomer (1981)</u> also did valuable work on the importance of sustainability. However, sustainability received the highest attention after the publication of the Brundtland Commission report in 1987 (UN, 1987).

The popularization of Brundtland Report made it a critical objective of a number of international agreements, such as the Framework Convention on Climate Change, the Rio Declaration, the European Union Environmental Action Program, Agenda 21, the Convention on Biological Diversity etc. (Grubb, Koch, Munson, Sullivan, & Thompson, 1993). The concept of SD is thus the most popular among ecologists and non-government organizations. Considering its importance and increasing social awareness, a number of organizations have made it as a part of their corporate mission.

The management and consumption of natural resources along with the alignment of social and economic development has taken valuable attention by governments, organizational leaders, social members and other stakeholders around the world. During the last few decades, a number of summits and conferences on human, environment and society has been arranged by different institutions including the United Nations. In 2012, leaders around the world gathered in Brazil to attend the conference organized by the United Nations on Sustainable Development. The aim of that conference was to discuss issues pertaining to equality, social development and protection of the natural environment. All the participants in the conference acknowledged that firms have a central role to play in achieving SD objectives in the world as they have a direct impact on a number of social and environmental aspects of SD. In addition to this, firms also play a central role in extending SD practices to other firms, such as suppliers or customers.

With the advancement of public understanding and awareness of sustainability issues, the concept of sustainability has started appearing in different disciplines like productions and operations management, supply chain management, quality management etc. According to <u>Marien (1994</u>), apparently there is a consensus on the policy and objectives of sustainability, however, in reality, differences exist. A principal reason is that when people say that we are in favour of sustainability, all people do not refer to it in the same way (Eden, 1994). Although, after the signatures of different countries, the concept of sustainability has become an international law under the United Nations Global Compact (UNGC, 2000), yet, there still remains some differences on the meaning of sustainability.

The World Commission on Environment and Development (UN, 1987) defined sustainability as the development that meets the needs of the present generation without compromising future generations' ability to meet their needs. This definition is considered as the simplest and too general as it is too difficult for firms to apply these concepts in their operations. To tackle this issue, in 1998, Elkington introduced the term triple bottom line (TBL). According to <u>Elkington (1998)</u>, the TBL concept has three dimensions, namely environment, society and economy which aims to measure the performance of firms. Costa and Menichini (2013) also measured sustainability on the

basis of similar three dimensions i.e. economic sustainability, environmental sustainability, and social sustainability.

In the SD scenario, environmental sustainability refers to firms' consumption of natural resources, such as energy, and how this activity impacts on the natural environment. Social sustainability refers to firms' support for developing the capabilities and skills of the general public, promoting healthcare system, encouraging equality, social and democratic justice within and outside the borders (McKenzie, 2004). The economic aspect of sustainability refers to firms' ability to achieve sustainability in operations, reducing operational and production cost and enhancing their revenue. To conclude, the TBL approach integrates environmental, social and economic aspects of firms' performance so that sustainability can be achieved in all aspects.

It is commonly believed that now the concerns of sustainability in the manufacturing industry are higher than ever. Because of a continuous campaign by environmentalists about the dwindling natural resources and change in the climate, the public awareness about the environment and natural resources has increased a lot. This increased awareness has also put lot of pressure on firms to follow environment-friendly practices. Therefore, firms have to consider new techniques for efficient utilization of resources, capitalizing on waste, controlling the air emission and water pollution (Xie et al., 2019). At the same time an organizational failure to manage sustainability will also result in a negative impact on corporate image, leading to declined firm performance.

Taking into account the principles of sustainability proposed by the Brundtland Commission report, <u>Kleindorfer, Singhal and Wassenhove (2005)</u> proposed a sustainable operations management concept. The sustainable operations management aims to integrate the efficiency orientation and profit orientation of firms' traditional operations management by considering internal and external stakeholders and the firms' operational impact on the environment. According to <u>Ittner (2008)</u>, firm performance can be measured in two categories, namely financial performance are growth in the sale, return on investment, return on equity, earnings before interest and tax etc.

Non-financial performance is normally measured by taking into account the firm's innovation performance, growth in market share, participation in social development activities and related key performance indicators.

The SD approach proposes that instead of evaluating firm's performance on traditional financial and non-financial aspects, it should be evaluated by considering TBL approach which not only includes the economic aspects, but also the environmental performance, operational performance, innovation performance and social performance. In the prevailing competitive business environment, manufacturing firms are focusing on improving their operations by becoming more flexible, quality focused, and becoming socially and environmentally responsible organizations (Caniëls, Gehrsitz, & Semeijn, 2013). Moreover, the newly designed international laws also have forced the firms to consider the sustainability issue in their processes and place it among their top priorities. Failure to do so will not only result in penalty and sanctions, but will also negatively impact on firms' image, ultimately leading to losing competitive advantage and declining performance.

Contrary to SD proponents' views that SD greatly enhances firms' capabilities to develop environment-friendly products and enhance their market share, plenty of studies are there which state that firms' involvement in SD initiatives negatively impacts on their performance. This group believes that because of firms' involvement in SD activities their operational cost increases which leads to increased products prices, resulting in the declined sale and market share (Brammer & Millington, 2008; Tang, Hull, & Rothenberg, 2012). Manufacturing and services industries both play a vital role in global economic development. However, SD has more importance in manufacturing industry since manufacturing firms mainly relies on different resources (natural and human-made) to manufacture its products. According to <u>Chen (2015)</u>, a manufacturing firm refers to a sequential interrelated operational activity which involves planning, operations, design, quality and marketing of durable goods. To achieve growth targets and fulfil growing population's demands, this industry has radically consumed the natural resources, resulting in damage to the natural climate.

To fulfil customers' needs, manufacturing firms have to utilize different resources. However, different international bodies, such as the United Nations, have imposed different sanctions on firms about the consumption of natural resources. For this reason, they have to consider the impact of their operational activities on natural environments, such as pollution.

3.2 - Defining Sustainable Development

<u>Brooks (1992)</u> said that policymakers should focus on designing the operational definition of SD. He believed that to be useful, the definition of SD must be focused on operational circumstances by linking objectives and decision principles. For this purpose, industrialists must not delay it can have an enormous negative impact on the environment which may be irreversible (Meadows, 1991). With the popularity of this concept and concerns raised by different stakeholders over the operations of businesses, sustainability or sustainable development has been defined by a number of researchers, academic and non-government institutions.

The Brundtland Commission's definition for SD is considered as one of the pioneer definitions for SD. According to the Brundtland Commission, SD is a "development that meets the needs of the present generation requirements without compromising the ability of future generations to meet their needs" (UN, 1987). According to <u>Lélé (1991)</u>, SD can be taken as a "metafix" that has the potential to unite profit-seeking businessman and equity-seeking social workers, environmentalists, wildlife lovers etc. <u>Trisoglio (1996)</u> defined SD as a human development which can be maintained in the future.

<u>Viedermann (1993)</u> said that sustainability is an ethical guideline which directs firms how they should perform their operations by considering the natural environment and society. He further said that sustainability is not something to define, but to declare. Similar to Brundtland Commission Report, <u>Shrivastava and Hart (1992)</u> defined sustainability as improving the environmental and social performance of firms for complying with the present generation's requirements without compromising the future generations' ability to fulfil their environmental and social needs. <u>Elkington (1998)</u> linked sustainability and sustainable society with three conditions which are as follow;

- The proportion of renewable resources consumption should not surpass the proportion of their regeneration
- The proportion of non-renewable resources consumption should not surpass the proportion of the development of renewable sustainable substitutes
- The proportion of emissions caused by population should not surpass the assimilative environment's capacity.

3.3 - Various Approaches to SD

The analysis of literature provides two different approaches to SD, namely systematic approach and economic approach.

3.3.1 - Systematic Approach to SD

A number of definitions related to sustainability describe different approaches to SD, systematic approach is one of these in which idea is related to systems and theory. The social phenomenon of SD includes a variety of interrelated and complex processes and elements which is called system phenomenon. Moreover, the natural environment and the human system are also significantly related so, it is hard to classify any issue purely a human or environmental issue (Dovers & Handmer, 1992).

In the context of sustainability, the system approach relates to ecology, especially resilience in ecosystems and populations. They considered Sustainability as a mixed system of human and natural elements to adopt endogenous or exogenous changes which includes improvements and deliberate changes aiming to fulfil present generation needs by maintaining or improving the system attributes. In the view of <u>Norgaard (1988)</u>, the systematic approach to SD includes six elements, namely complexity, reflexivity, continuous evolution, culturally framed perception, learning in the organization and learning through trial and error.

3.3.2 - Economic Approach to SD

The analysis of SD definitions indicates that economics aspects of SD are focused on environmental economics which concentrates on natural resources. This approach relates to neo-classical philosophers, particularly <u>Klaasen and Opschoor</u> (1991) with the assumptions of decreasing returns to scale, equilibrium and rational economic actors. Taking into account the economic perspective, <u>Pezzey (1989)</u> defined sustainability as the non-deteriorating value of society members in the long time which ensures that next generation has an equal amount of capital as the current generation started with.

<u>Pearce, Markandya and Barbier (1989)</u> mentioned two components of capital, namely natural capital and human capital. Green thinking or green environmental economics is the substitute for the neo-classical approach to economic thinking. Green economics proposes a vision that environment and human-oriented economic systems should be focused on SD. The reason for including social aspects in the economic approach of SD is that any system that is ecologically sustainable is hard to be unstable for social development.

3.4 - Change in the Climate

There has been a valuable discussion about climate change and designing a policy to tackle these changes since 1980s. A comprehensive scientific model and its understanding are critical to know and tackle climate changes since the natural climate is extremely complex. For example, according to <u>McElroy (1986)</u>, the atmosphere of the earth, soil and oceans are interlinked through the material, energy and major chemical compounds flow. Such interactions cause significant damage to the environment and continuous climate change. <u>Den Elzen (1993)</u> mentioned twenty-one elements which cause uncertainty in climate, such as Biospheric activities, climatology and atmospheric chemistry. Out of those twenty-one elements, seven elements have a negative impact, six have positive and remaining eight's impact is unknown.

3.5 - Triple Bottom Line (TBL) and Sustainability

The term Triple Bottom Line (TBL) relates to sustainable development practices of organizations and was introduced by Elkington in (1998). The concept of sustainability gained valuable attention after the introduction of term sustainable development (SD) and TBL. Taking its roots from sustainability, TBL aims to measure the performance of organizations on three criteria, namely environment, economic and social (Hussain et al., 2018). In the original TBL term, Elkington used profit, planet and people as representatives of TBL. According to <u>Elkington (2018)</u>, using TBL, firms express their expansion by integrating environmental agenda with economic and social agendas. The literature on sustainability shows inconsistency in its focus. For example, <u>Yan, Chen and Chang (2009)</u> said that sustainability mainly focuses on social development. <u>Bibri (2008)</u> said that sustainability represents all the three aspects, namely the economy, society and environment.

TBL is a more comprehensive and balanced approach which places equal emphasis on each aspect. This results in an increased coherence and balance between the constructs. It is important to understand that TBL is not a different concept, but a construct related to sustainability which provides additional balance and consistency by always referring to environmental, social and economic dimensions, and integrating these dimensions. Secondly, unlike sustainability, TBL lays an equal emphasis on all the constructs which results in enhanced coherence and balance in the constructs.

Elkington, the founder of TBL term, said that TBL expresses environmental agenda by integrating it with economic and social aspects. <u>Goel (2010)</u> said that TBL acts as a framework to measure business performance on economic, social and environmental aspects. <u>Rogers and Hudson (2011)</u> termed TBL as a practical framework for sustainability which focuses on firms performance with respect to economic, social and environmental performance.

3.6 - Renewable Energy and SD

In the last two decades, a number of philosophers, researchers and environmentalists popularized the concept of renewable energy. The environmentalists believe that renewable energy has central importance in achieving SD objectives. The renewable energy aims to support businesses to abandon traditional means of energy consumptions and adopt new and sustainable energy means. While renewable energy is equally important for all countries, only few countries such as Norway, Denmark, Sweden, Germany, China etc have paid significant attention to its importance and have shifted a valuable percentage of their energy reliance on renewable energy. As compared to European countries, Africa and the Asian region countries have paid little attention to renewable energy aspects.

For socio-technical transitions, the policy theory explained by different philosophers in different contexts has made valuable addition to investigate and analyse the determinants of energy transitions. These theories have mainly been developed and explained for the energy transition in the Western European nations.

As this concept is at introductory level, there is a strong need for creating international laws to bound businesses to integrate renewable energy into their production operations. While the processes of renewable energy are same, the means of transition to renewable energy vary from country to country and influenced by the variety of factors resulting in a difference in the directions and speed of transition. Because of these differences, different researchers have developed different types of policy theories and have explained the determinants of transition and trends in diverse contexts.

Considering the importance of renewable energy, some developing countries, such as China and Pakistan have also started paying attention to renewable energy. These developing countries have applied a multi-level perspective on social-technical energy transition. The government of Pakistan has paid significant attention to promote environment-friendly processes and taking valuable initiatives to encourage and bound industries to follow environment-friendly processes. Pakistan has great potential to grow with respect to infrastructure, energy efficiency, agriculture and industry production enhancement and manufacturing and services industries development. It has a huge volume of labour which, with just a smooth touch of training, can become a highly skilled labour force. Because of the growing population, Pakistan is also facing a significant

issue of power shortage and uneven distribution of power between large and small cities. This issue is opening the path for capitalizing on renewable energy, such as solar and wind energy. A number of businesses and residential areas have started benefiting from solar energy by installing solar panels at their places and reducing their reliance on traditional energy means.

3.7- ISO 14001

A large number of organizations believe that quality is similar to guidelines recommended in ISO 9000-9001. The performance improvement guidelines could also be taken as a method within TQM. The principles of ISO 9000 can be integrated with ISO 14000, which contains principles for environmental management, and ISO 26000 containing principles for corporate social responsibility. Since, achieving SD objectives is crucial for the organization to promote environmental and social management standards, hundreds of thousands of companies around the world have obtained such ISO certifications.

3.8 - Sustainability from Resource-Based View (RBV)

To become a model and socially responsible organization companies have to follow a path as they cannot turn into a model organization overnight (Castka & Balzarova, 2007; Zadek, 2004). With the advancement of quality and sustainability concepts, the resource-based view (RBV) has gained valuable consideration in different disciplines (Cao & Zhang, 2011). Firms have different types of resources, such as human resource, their capabilities, knowledge and information etc. The RBV suggests that differences in organizational performance can be understood through the effective management and utilization of such resources.

Firms investment in enhancing their resources and capabilities enable them to achieve hardly-imitable and rare competitive advantage (Barney, 1991). The RBV also enables firms to concentrate on their core values which will enable them to enhance their particular skills and achieve economies of scale (Park, Mezias, & Song, 2004). Hart (1995) applied a RBV to examine organizations' environmental and social responsibilities and said that it will enable organizations to get and sustain competitive

advantage as CSR helps the organizations to sustain their operations in a globally challenging environment (Costa & Menichini, 2013).

3.9 - Corporate Social Responsibility

Organizational sustainability is linked with their financial, social, and environmental performance (C. H. Chen & Wongsurawat, 2011). In contrast to financial performance which is in a more numerical format the environmental and social performance are more theoretical and conceptual. Some researchers, such as <u>Chen</u> and <u>Wongsurawat (2011)</u> and <u>Reinhardt, Stavins and Vietor (2008)</u> termed it as corporate social responsibility (CSR). CSR is all about how business activities impact on society (Costa & Menichini, 2013). European-Commission (2001, 2011) defined CSR as "a concept according to which companies voluntarily decide to contribute to the attainment of a better society and a cleaner environment". <u>Hollingworth and Valentine (2014)</u> and <u>Wartick and Cochran (1985)</u> termed CSR as a part of corporate social performance (CSP). CSP efforts focus on meeting societal changing conditions.

The stakeholders, especially government, public, and customers expect organizations to participate in social and environmental improvement to counter the negative impact of their business operations (De Grosbois, 2012). CSR activities should be part of organizational culture (C.-H. Wang et al., 2012) as it not only fulfils stakeholders' expectation, but also enhance companies' performance, build customer loyalty, and promote organizations' reputation (Basu & Palazzo, 2008).

During the last few years, CSR has enjoyed valuable attention, not only from the public and private organizations but also from academic researchers. The CSR activities have expanded from environmental protection and sustainable development to social equity and sustainable economic growth (McAdam & Leonard, 2003). Modern companies use CSR as a differentiating tool as it not only increases their profitability (Castka & Balzarova, 2007; Margolis, Elfenbein, & Walsh, 2007) but also enhance customer loyalty (Costa & Menichini, 2013). Being part of society, organizations have to consider their operations' impact on society and they contribute to the public and society good.

The literature on CSR definition refers to four societal issues i.e. economic, political, social, and ethical (Costa & Menichini, 2013), while (Garriga & Melè, 2004; Kotler & Lee, 2005) proposed to categorize CSR theories into four groups i.e. political, instrumental, ethical, and integrative. The instrumental group focuses on achieving economic goals and takes CSR as a tool to enhance organizations wealth by building companies' image. The political group takes CSR activities as social commitment and companies' duty. The ethical group also hold a similar concept and take CSR activities as an ethical obligation for the corporations. Lastly, the integrative group believes in developing integration between company and society demands and believes that organizations success relies on social wellbeing.

The return of organizations' investment on CSR activities is directly related to public recognition of organizations' socially responsible activities; hence, to measure CSR, organizations cannot ignore the stakeholders. Costa and Menichini (2013) proposed a multidimensional approach to evaluate CSR activities focused on stakeholders' perception which enabled them to evaluate the social behaviour of the company and the stakeholders' point of view. They claimed that an organization can be responsible for society only in the environmental aspect. Peterson (2004) said that the stakeholders' perception of the organization's CSR activities have a positive association with their commitment to organization, reputation, and it also attracts the employees. CSR has also been found to have a positive impact on employees' attitude and behaviour (Trevino & Nelson, 2011).

Khodadadi and Feizi (2015) termed CSR as the transparent practices of business, based on ethical values, which not only comply with legal requirements, but also go beyond it by including respect for people, the betterment of the community, and the environment. So, in the CSR context, companies have to think beyond making a profit by focusing on the totality of their impact on people, society, and environment. Peddle and Rosam (2004) said that we cannot separate CSR from quality as both focus on organizational success; however, they stressed on developing a balance between these two. Castka and Balzarova (2007) proposed the integration of CSR, quality, strategy, operations, and technology proposing that quality management practices can lead to CSR activities.

CSR is taken as an important mean which directs the organizations towards success and such activities are performed not only by big organizations but also by small and medium enterprises (SMEs) (Chelliah, Chelliah, & Jaganathan, 2017). It is a voluntary act and more than compliance with government regulations (Menguc & Ozanne, 2005). Some of the popular CSR standards and evaluation methods are United Nation Global Compact, Global Reporting Initiative (GRI) ISO 14001, Social Accountability 8000 (Koerber, 2010); while the frequently used CSR methods are reputation indices, corporate reports content analysis, scales to measure CSR at the individual and organizational level (Turker, 2009) etc. From Fortune Global 250, approximately 75% of firms use GRI guidelines to present their CSR activities report.

The literature provides a mix of evidence on the impact of CSR on firms' performance. A number of studies explained the positive relationship between firms' CSR and their financial performance. <u>Spicer (1978)</u> is considered among the pioneers to investigate the relationship between CSR and firms' financial performance. According to Spicer, medium to strong relationship exists between firms' CSR activities and their financial performance. <u>Zhu, Sarkis and Lai (2012)</u> said that firms' investment and involvement in environmental and social activities positively impact on their financial performance and enable them to achieve competitive advantage. Using RBV, <u>Hart (1995)</u> said that those firms that take valuable measures to develop and maintain good relations with society and the natural environment have a tendency to enjoy a competitive advantage.

Some studies also identified a negative or neutral relationship. Nollet, Filis and Mitrokostas (2016) studied the impact of CSR activities on organizations financial performance through accounting based (return on assets and return on capital) and market-based (excess stock returns) performance indicators by using Bloomberg's environmental social governance disclosure score. As per them, organizations' social activities have a negative impact on return on capital in the short run; however, in the longer run, it gradually turns into positive effects. Hence, they proposed for formulating long term planning and resources allocation for CSR activities. Moreover, they said that governance is the main driving body of organizations for CSR activities.
Mittal, Sinha and Singh (2008) also found a negative relationship between firms' CSR activities and financial performance while Schreck (2011) found mix relation between CSR activities and organizations' financial performance. The negative attitude of employees, personal interests, management's lack of CSR or related economic issues' understanding etc are some of the hurdles in corporate socially responsible actions (Hazlett, McAdam, & Murray, 2007). Moreover, ineffective communication of managers (difference in words and actions) and organizational inertia are some other barriers in organizations' social actions.

3.10 - Dimensions of CSR

The literature on CSR provides mix arguments. Costa and Menichini (2013) proposed three dimensions of CSR i.e. economic, social, and environmental dimensions which benefit people, community, and the society. <u>GRI (2006, 2011)</u> mentioned three dimensions of CSR i.e. economic, environmental, and social dimension. Dahlsrud (2006) conducted an analysis of 37 definitions of CSR and proposed five dimensions i.e. environmental, social, economic, stakeholders, and voluntariness. <u>Chen_and</u> <u>Wongsurawat (2011)</u> mentioned transparency, competitiveness, responsibility, and accountability as the core constructs of CSR.

Accountability is an individual's behaviour within the social structure and is completely different from being responsible as one can respond without being accountable. Organizational transparency is the level of information available to the stakeholders within and outside the firm (Bushman, Piotroski, & Smith, 2004). The more a company is transparent in its operations the more confidence in quality, integrity, and effectiveness of their products and services they receive from the public. For this reason, companies must develop strategies which help them to achieve transparency goal. To remain competitive, organizations must provide goods or services of high quality as it leads to organizational sustainability. Moreover, the pressure exerted by stakeholders drives organizations toward corporate responsibility (Bushman et al., 2004).

Turker (2009) identified four dimensions of CSR i.e. CSR to social and non-social stakeholders, customers, government, and employees. According to Trevino and Nelson (2011), CSR includes legal, economic, philanthropic, and ethical responsibilities. Economic responsibilities include developing goods and services as per consumers' desire. Carrying out business activities in an ethical manner e.g. being more social and avoiding harm to society are the ethical responsibilities of organizations. Philanthropic responsibilities include the behaviours and actions which can benefit society.

3.8 - Dimensions of CSD

The increasing social and environmental externalities rooted by the prevailing economic system has made it crucial for the organizations to bring fundamental reforms to become a socially responsible and sustainable organization (Preuss & Córdoba-Pachon, 2009). ISO 14000, which is more concerned with environmental quality standards than ISO 9000, has helped the organizations to promote sustainability with their activities (McAdam & Leonard, 2003). Similarly, the ISO committee on consumer standards also has started the evaluation of CSR standards. The reason for this is that plans must be formulated to counter the environmental risks.

3.8.1 - Economic Sustainability

The economic dimension of SD refers to the impact of organizational business activities on their financial performance. It also concerns with the economic impact of an organization's activities on stakeholders (GRI, 2006, 2011). The economic dimension acts as one of the three sub-systems of sustainability which facilitates firms to support future generations (Spangenberg, 2005). It links organizational growth with national economic growth and investigates how efficiently it contributes to support it. It can be said that economic sustainability focuses on value added by the firm to its surroundings in a way that it develops and strengthens its ability to secure, support and protect future generations' interest.

The economic dimension of sustainability aims to generate prosperity in society by concentrating on the cost efficacy within economic system (GRI, 2006). The economic dimension represents firms' commitment to distribute economic values generated, following fair criteria to hire workers from the local community and seriously following the policies related to local suppliers. These initiatives have a positive impact on different stakeholders' understanding and perception and provide a swift boost to the firm. <u>Abbas and Sağsan (2019)</u> analysed the impact of knowledge management on firms' sustainable performance and found that economic dimension of sustainability has a significant relationship with organizational trust, which leads to workers' enhanced job satisfaction.

It is commonly believed that when workers observe that their firm is making active participation in society with economic values, they tend to feel more satisfied and loyal to their organization. Some of the reasons for such enhanced loyalty and satisfaction are improvements in firm productivity, enhanced customer satisfaction, firm reputation etc. These elements directly impact on workers' job performance.

3.8.2 - Social Sustainability

The social aspect of sustainability refers to TBL approach proposed by <u>Elkington</u> (1998) and focuses on following fair practices in business, ensuring the rights of labour, respecting human capital and ensuring the well-being of the society. Social dimension considers organization social activities' impact on social system e.g. public policy, health and safety measures, work practices etc. (GRI, 2006, 2011). The main purpose of social sustainability is that firms should pay back to the society and community. Some of the examples of social sustainability are offering fair wages to the workers, providing health care facilities to employees, ensuring a balance between professional and personal life etc.

It is also believed that ignoring social responsibility aspect can negatively impact on firms' economic sustainability. Some researchers, such as <u>Shahzad et al.</u> (2019) and <u>Bibri (2008)</u>, said that firms active participation in social development programs result in enhanced customers' loyalty. <u>Goel (2010)</u> said that firms' action pertaining to social sustainability focuses on promoting interaction between organization and community. This helps the firm to pay attention to issues pertaining to society, customers, employees and other stakeholders. The social sustainability focuses on the impact that organizations make on society through their operations.

A socially responsible firm also ensures the availability of equal opportunities for community members, offers handsome salaries, provides a decent working environment and safeguard the health of their workers (Campbell, 2018). Moreover, some of the social actions which a firm can take toward society are durability and safety of products and services, paying prompt and adequate attention to customers' complaints and queries, taking effective measures to ensure the compliance with the demand of different products and services, participating the initiatives to respect the historic culture, heritage and traditions (McAdam & Leonard, 2003). In addition to this, firms can demonstrate their social sustainability by making participation in programs strengthening the quality of social life.

3.8.3 - Environmental Sustainability

The environmental dimension of sustainability focuses on adopting practices that do not harm the natural environment and aim to protect it. This dimension concentrates on the impact of organizational operational activities (in the form of input and output) on the environment e.g. gas emissions, water consumption, energy etc. (GRI, 2006, 2011). It also focuses on engaging practices which protect the natural resources safeguarding the future generations' interests. To achieve environmental sustainability, firms adopt those practices which help them to ensure the efficient utilization of energy, minimizing the emissions of greenhouse gases, abandoning traditional means of production causing damage to the natural environment and capitalizing on modern technology to achieve energy and performance efficiency. Similar to economic and social sustainability, the environmental aspects also have equal importance in business operations to achieve sustainability.

<u>Alhaddi (2015)</u> referred to <u>Kearney (2009)</u> who analysed ninety-nine organizations from eighteen different industries focused on using sustainable practices and examined how their environmental activities impact on their performance. These firms were originated from automotive, tourism, food, technology and related industries. Kearny analysed these firms for six months and tried to examine whether their sustainability practices positively impact on economic performance or not. The empirical results indicated that firms that focus on following environment-friendly practices and actively participate in social development programs by ensuring the well-being of society and stakeholders experience more financial growth than their competitors. Some of the key reasons for such increased financial performance are reduced operational cost, efficient utilization of resources and capitalizing on green products. The environmental dimension of sustainability aims to preserve and manage natural resources, particularly the non-renewable ones having key importance to support life. For this purpose, this dimension focuses on adopting practices which minimize the pollution (including air, water and soil), efficient utilization of resources to save operational cost. The environmental dimension also concentrates on the consumption of water and energy resources and preserving the natural heritage and biological diversity. This dimension pays special attention to promoting tourism since the conservation of natural environment greatly enhances the tourism industry.

CHAPTER 4

REVIEW OF LITERATURE - KNOWLEDGE MANAGEMENT

4.1 - Introduction to Knowledge and Knowledge Management

In the recent few decades, knowledge has become a strategic resource for organizations to acquire and sustain a competitive advantage (Petruzzelli, 2008). Because of technological advancement, such as the internet, the world has become a global village. To successfully compete in the modern business world organizations must ensure that they have the potential to learn and adopt new things faster than their competitors so that they can take a competitive advantage (Albort-Morant, Leal-Millán, & Cepeda-Carrión, 2016). A number of studies have proved that knowledge, as well as knowledge management (KM), have critical importance in enhancing organizational performance. It is also a well-established phenomenon that organizations which actively participate in learning activities tend to perform better than others. According to <u>Cavaleri</u> (2004) organizational KM and learning, capabilities have the potential to accelerate organizational effectiveness level.

4.2 - Understanding Knowledge

In the view of Nonaka and Takeuchi (1995), knowledge is an asset, which must be identified, acquired, used, stored, shared and evaluated in the company. Downes (2014) defined knowledge as the understanding or awareness gained by the individual or the group of people from data, information, skills, experience, reasoning and learning.

<u>Davenport and Prusak (1998)</u> defined knowledge as a fluid combination of framed information, values, experience and expert insight that enables an individual to evaluate and incorporate novel information and experiences. Knowledge develops the link between information and experience. <u>Bennet and Bennet (2008)</u> defined knowledge as the capacity to take effective actions and make the right decision in an uncertain situation.

4.3 - Classifications of Knowledge

Ikujiro Nonaka is a world-renowned Japanese organizational theorist, famous for his expertise in knowledge discipline. He is considered an expert in the field of KM. According to Nonaka (1991), knowledge can be classified into two forms, namely explicit knowledge and tacit knowledge.

4.3.1 - Explicit Knowledge: Explicit knowledge can easily be captured or shared with others in specific forms, such as books, verbal communications, drawings and graphs. Considering its nature, it is also called as universal knowledge. Explicit knowledge can also easily be retrieved and shared with others since it can be written in numbers which can easily be managed. Some researchers, such as <u>Klicon (1999)</u> termed explicit knowledge as readily available knowledge as it is recorded, codified and stored in a structural manner.

4.3.2- Tacit Knowledge: In contrast to explicit knowledge, tacit knowledge cannot be transferred or communicated to others since it resides in an individual's mind and yet to be documented formally. Once the tacit knowledge, residing in the mind of individual get documented, it becomes explicit knowledge. It is hard to formalize the tacit knowledge as it is influenced by individual commitments, values, ideas, and emotions and includes intuition, subjective insights, and hunches (Debowski, 2006). However, as knowledge is created and expanded through dialogue, discussion and continuous debate, explicit knowledge and tacit knowledge are complementary to each other's, especially for creating new knowledge (Nonaka, 1994). Such interaction leads

to the creation of four forms of knowledge, namely socialization, externalization, combination, and internalization.

On the horizontal and vertical sides of the knowledge creation model, tacit and explicit knowledge are placed, along with the indication of the transfer of direction. In this model, the conversation of tacit knowledge for the creation of new tacit knowledge for sharing is termed as socialization. In socialization, individuals share their experiences, gained from different means, through social interaction. In externalization, tacit knowledge is converted into explicit knowledge. In externalization, tacit knowledge acts as the foundation for new concepts and written knowledge. In the combination form of knowledge, the explicit knowledge is collected from inside as well as the outside of the organization. This knowledge is reconfigured, arranged, contextualized and categorized, so that more comprehensive and systematic knowledge can be produced. In Nonaka's model of knowledge creation, the conversation of explicit knowledge to tacit knowledge is termed as internalization. In this form, knowledge is applied to real-life situations.

4.4 - Knowledge Management

Knowledge management (KM) is considered as an important tool to enhance organizational performance and achieve their objectives. A number of organizations around the world have implemented an effective KM system and have experienced significant improvement in their performance (Zack, McKeen, & Singh, 2009). According to <u>Sallis and Jones (2002)</u> and <u>Liao and Wu (2009)</u>, the discipline of KM has been derived from related disciplines, such as information system, management, strategic management, organizational behaviour and business theory.

KM enables the organizations to use the knowledge in efficient manners so that the organization can make the right decision, at the right time, which ultimately leads to taking competitive advantage. In the present highly competitive business environment, where customers have a lot of demands, it is imperative for the organizations to use the organizational knowledge in efficient ways, and take it as assets. KM enables the organizations to produce high quality of goods and services by utilizing the least amount of resources. It also helps the employees to become more innovative and creative in their operational activities and address the customers' demands in effective manners (Sandhawalia & Dalcher, 2011). In the view of Bollinger and Smith (2001), the objective of KM is to discover, enrich, and connect the fragmented knowledge, which organization acquire through experience, into collective knowledge.

4.5 - Definitions of KM

According to <u>Yahya and Goh (2002</u>), the principal reason for the lack of a universally accepted definition of KM is the differences in the perspectives dimensions meaning by different schools of KM. Another key reason for this issue is the differences in approaches to definine KM. Some researchers, such as <u>Davenport and Prusak</u> (2000) adopted information system approach to define KM, while others, such as <u>Newell, Robertson, Scarbrough and Swan (2002)</u> and <u>Beijerse (2000)</u> prefered a strategic approach. There is also a group of researchers, such as <u>Swan, Newell, Scarbrough and Hislop (1999</u>) and <u>Skyrme (1999</u>) which adopted a human resources approach towards KM.

Table 3: Knowledge management gurus and their contribution (Extracted from Zwain (2012))

KM guru	Main contribution
Chris Argyris	 He first used the phrase "organizational learning" (see Argyris, 1993). Contributed to understanding of organizational learning using his famous theories (single and double loop learning models).
Thomas H. Davenport	 Famous for "Davenport's 10 principles" of knowledge management. Drew an important difference between data, information and knowledge (see Working Knowledge 1998, written jointly with L. Prusak).
Peter Drucker	 Focused on the factors that determine the productivity of knowledge workers. Developed four ways to motivate knowledge workers. (see Management Challenges for the 21st Century 1999)
Dorothy Leonder	 Best known as the author of "Wellsprings of knowledge". Highlighted the core capabilities as a starting point for managing organizational knowledge (see Leonder, 1995).
Ikujiro Nonaka	 Introduced the idea of the social nature of knowledge creation. Originated the four major processes of knowledge conversion (see <i>The Knowledge- Creating Company</i> 1995, written jointly with H. Takeuchi).
Peter Senge	 The idea of learning organization was his main concern. Developed the five core disciplines for building a learning organization (see <i>The Fifth Discipline: The Art and Practice of the Learning Organization 1990</i>).

KM Gurus and their Main Contributions

<u>Van Ewyk (2000)</u> revealed that KM is an ongoing strategy which aims to get specific knowledge at the right time for the right person, and motivates workers to share knowledge so that their knowledge can be exploited and other also can capitalize on their knowledge which will lead to enhanced organizational performance. According to <u>Shahzad et al. (2019)</u>, KM is an organized system of acquiring, arranging and sharing knowledge with employees in a way that it can be reused by other employees, leading to the achievement of organizational effectiveness and enhanced productivity. <u>Liao and Wu (2009)</u> also defined KM in a similar manner and stated that KM is a process of acquiring knowledge, conversion and application.

Contrary to other researchers, <u>Beijerse (2000)</u> followed the strategic approach to define KM and said that KM is the achievement of firm goals and objectives through making knowledge factor more productive. Similar to Beijerse, <u>Swan, Newell,</u> <u>Scarbrough and Hislop (1999)</u> also adopted a strategic approach for KM and suggested that KM refers to ways through which firms mobilize its knowledge resources against the turbulent environment. KM enables the organization to efficiently utilize the knowledge, which ultimately will lead to attaining competitive advantage. Similar to philosophy, management, sociology, economics, and other systems, KM has been surfaced as a unique system (Davis, 2006; Schroeder & Pauleen, 2007).

4.6 - Frameworks of KM

A framework refers to factors and their arrangement which enhance the stakeholders' understanding with respect to activities and processes related to a particular domain. KM framework represents the KM domain and its components which facilitate KM comprehension in organizations, and act as foundational blocs for applying and executing KM practices. A number of people have identified different frameworks for KM which aims to highlight its characteristics, how they are related to each other, which factors are the foundational blocks of KM and how they should be implemented so that effective KM system can be executed. KM frameworks also offer the contextual analyses and examination of KM practices (Marin-Garcia & Zarate-Martinez, 2007).

In <u>1995</u>, <u>Nonaka and Takeuchi</u> proposed knowledge conversation model and grouped it into four sections, namely socialization, externalization, combination and

internalization (SECI). On the outer sides of this model, tacit and explicit types of knowledge are placed. According to this model, firms cannot create knowledge on their own, but the knowledge held by individual workers enable firms to create new knowledge. In the knowledge conversation model, the socialization section represents the field through which organizational tacit knowledge is transformed into tacit knowledge. Organizational members share their skills and experience through observation and imitation. The second area of knowledge conversation model refers to externalization mode. In this mode, the tacit knowledge is transformed into explicit knowledge by using analogies, metaphors, models and concepts which normally are contained in documents forms, such as books, manuals and databases.

In the SECI model the explicit knowledge and concepts are further made explicit in combination mode by analysing and rearranging the information inside the organization. Firms achieve the objective of analysing, rearranging and converting the information through information technology and related tools, such as database, data mining and local area network. The final mode of knowledge conversation model relates to internalization. In internalization explicit knowledge is converted into tacit knowledge through hands-on practices, such as real-life experience or replication models.



Figure 10: Knowledge conversation model proposed by Nonaka and Takeuchi (1995)

<u>Downes (2014)</u> categorized KM into two broad frameworks, namely descriptive and prescriptive. According to Downes, descriptive frameworks focus on illustrating the phenomena and nature of KM. The prescriptive frameworks of KM aim to propose strategies and methodologies for KM (Marin-Garcia & Zarate-Martinez, 2007). In his book, namely 'knowledge management foundation, <u>Wiig (1993)</u> illustrated the descriptive framework of KM. Wiig's framework was based on knowledge creation understanding, its manifestation, methods and techniques to use and transfer. Wiig's framework was grounded on three pillars, representing key functions of KM, namely knowledge exploration, knowledge evaluation, and leading activities related to KM.



Figure 11: Descriptive KM framework by Wiig (1993)

In a book section, <u>Stankosky (2005)</u> presented another KM framework which was built on four pillars, namely leadership, organization, technology and learning. The leadership pillar includes a variety of elements, such as organizational vision and cultures, goals and objectives, strategies for growth and development, market segmentation and communication. The Organizational pillar focuses on organizational processes, such as operations and management, KM and TQM strategies, workflow, organizational formal and informal structure. The pillar of technology includes a variety of information processes, such as online communication, storage of information, decision support system, tools of management and communication and processes design and modelling. Finally, organizational learning pillar focuses on individual learning activities which leads to organizational leering. This pillar includes organizational innovation, training and development, organizational behaviour, social engineering, sharing and collaboration.



Figure 12: KM Framework by Stankosky (2005)

In 2010, <u>Hertlein, Smolnik and Riempp (2010)</u> presented their KM framework in a conference on System Science in Hawai. Their framework was also based on a variety of pillars; however, it also included three layers, named as strategy, process and system. According to them, each layer is influenced by organizational culture. The business strategy included two sub-strategies, such as business strategy and leadership, and system of measurement. The process also encompasses two sub layers, namely KM processes and business and support layers. The system layer is the most comprehensive and includes a number of elements, such as employee's portal, content management, sharing and partnership between and outside the departments to create new products and processes, individual and group competencies, and organizational orientation with respect to management, navigation and searches. The <u>Hertlein, Smolnik and Riempp (2010)</u> framework's pillars are backed by organizational structure, application and support of system, acquisition and integration of knowledge and finally through IT infrastructure.



Figure 13: KM framework by Hertlein, Smolnik and Riempp (2010)

In 2014, Downes presented his KM framework. Downes' framework was related to <u>Stankosky (2005)</u> as well as to <u>Beijerse (2000)</u> as it not only included four pillars, but also two circular layers, named as people and processes (Downes, 2014). Moreover, organizational strategy, culture, learning, leadership and structure are sandwiched between the outer layers of people and processes. At the centre of Downes's framework, the processes and activities of KM which facilitates KM cycle are placed, namely knowledge creation, knowledge storage and retrieval, knowledge transfer and knowledge application. Finally, the organizational operations are influenced by external factors, namely political, economic, social, technological, environmental and legal elements.

• **Political:** Organizational operational, financial and social activities are significantly influenced by the change in government.

• Economic: The national economic situation positively impacts on the number of organizational customers.

• **Social:** Organizational processes should respect social and environmental aspects. They should take measures to minimize the negative impact of their operations on society and the environment.

• **Technological:** Organizations should capitalize on modern technology and pay adequate attention to research and development activities so that new means of production and operations can be identified which ensure environment-friendly operations and also positively impact on organizational performance.

• Environmental: The level and means of organizational processes to produce goods and deliver services, how the impact of their operations on the natural environment.

• Legal: The legal aspect focuses on employment regulations, workers' health and safety, working environment and the standards which impact on organizational operations, workers, management and stakeholders.



Figure 14: KM framework by Downes (2014)

<u>Sağsan (2009)</u> introduced KM discipline from interdisciplinary perspective and divided his framework into four sections, namely technological, socio-technical, inter and intra organizational and humanistic paradigm. The upper section of the matrix represents knowledge, the lower section represents the information elements. Moreover, the left section represents the objective stance of explicit knowledge and structured information, while right section represents subjective stance of tacit knowledge and semi or unstructured information.



Figure 15: Interdisciplinary perspective of KM paradigm (Extracted from Sagsan (2009))

The literature provides a number of other frameworks in which researchers categorized and linked KM with organizational strategies. However, the literature fails to provide consensus on a common framework which incorporates all others.

4.7 - Advantages of KM

Similar to TQM, the practices of KM are used by the managers to improve organizational performance. In the present technological environment, knowledge is acting as a key resource for the organizations. As almost all the organizations have access to information, the problem in the present era is not to acquire the information but to manage it (Abbas, Mahmood, & Hussain, 2015). In the current highly competitive business environment, a lot of businesses are struggling on how to convert information into knowledge and use it in efficient manners so that it can enhance organizational performance and as well as profitability (Sallis & Jones, 2002). For this reason, KM has gained a lot of attention by managers in manufacturing as well as in service industries.

According to <u>Wang (2007)</u>, the practices of KM can facilitate the organizations in a number of manners, such as training of employees, effective decision making, planning and development, knowledge sharing, and improved organizational performance. To achieve these benefits, Carlucci and Schiuma (2006) emphasized on understanding the link between organizational performance and KM and integrating KM with organizational

strategy. The sharing of knowledge within and across the departments has fundamental importance in getting the desired benefits from it. Because of changing customers' preferences and complex market structure, more and more firms are becoming adoptive to KM. Moreover, in the current technology and information-based society, to become successful, a firm has to consider KM as a strategic tool.

It is a well-acknowledged fact that practically, all firms are becoming knowledgedriven so that they can ensure efficiency in their operations. A number of researchers, such as <u>Al-Alawi, Al-Marzoogi and Mohammed (2007)</u>, <u>Ansari, Holland and Fathi (2010)</u> and <u>Bhatt (2001)</u> stated that learning organizations take KM a strategic tool to achieve competitive advantage. According to <u>Safa, Shakir and Boon (2006)</u>, organizational ability to integrate and incorporate KM in their operations will not only enable them to achieve a competitive advantage but will also help them to fulfil customers' requirements in the modern electronic economic environment. This competitive advantage will guarantee an enhanced firm's performance.

<u>Freeze and Kulkami (2007)</u> said that KM enables firms to innovate new products and services which differentiate them from other traditional firms. KM also believed to be a great tool to work as a strategic resource and a driving instrument to implement the business strategy (Bollinger & Smith, 2001). In the view of <u>Merat and Bo (2013)</u>, KM has great potential to facilitate firms in the long-term as its main objective is to ensure sustainability and development in organizational performance. This greatly relates to the strategic management aspect of TQM as KM plays a critical role in designing and executing strategy. Examining the role of KM in the education sector, <u>Kidwell, Vander</u> <u>Linde and Johnson (2000)</u> argued that similar to manufacturing industries, KM also plays a central role in the services sector, such as higher education. They said that KM greatly facilitates firms in research processes, designing curriculum, offering services to students and alumni, performing administrative services and designing business strategy. Moreover, KM also indicates a direct impact on the achievements of a higher education institution.

4.8 - Knowledge Management and Organizational Learning

Organizational learning is a process through which organizations not only learn new means of operations, but also identify the mistakes and take initiatives to fix and avoid such errors in the future (Argyris, 1999). <u>Fiol and Lyles (1985)</u> defined organizational learning as a process through which organizations improve their knowledge and understanding which enable them to excel in their operations. According to <u>Dogson (1993)</u>, organizational learning is the mean through which businesses design, supplement and arrange knowledge and activities within their culture so that their organization not only develop and improve its efficiency, but also boost its workers' skills.

In his book, titled "Knowledge Management" <u>Debowski (2006)</u> mentioned that organizational learning involves not only the acquiring the new knowledge, but also the workers' development through training so that organizational performance can be enhanced, leading to achieving the competitive advantage. Considering these definitions, a number of researchers, such as <u>Pemberton and Stonehouse (2000)</u>, <u>Schilling and Kluge (2009)</u> and <u>Zack, McKeen and Singh (2009)</u> stated that KM and organizational learning closely associated.



Figure 16: Framework of the relationship between KM and organizational learning by Pemberton & Stonehouse (2000)

Similar to KM, firms can achieve learning objectives by concentrating on three aspects, namely organizational structure, organizational culture and infrastructure and means of communications available to the organization. Organizations with strong learning culture have a clear vision for the individual as well as organizational learning. Such organizations value knowledge sharing (AI-Alawi et al., 2007). Moreover, they also empower their workers to take a decision. Organizations with strong learning culture have great trust in their employees and they motivate them to acquire and share knowledge within and outside their organizational structure. Businesses promote learning with their organization through the organizational structure as it includes special cross-functional groups via a network. It also promotes learning through cross-functional projects in groups. Finally, organizational infrastructure includes tools, techniques, systems and technology which fortify learning activities, structure and culture.

4.9 - Knowledge Management Practices

The literature indicates a number of practices which facilitates the success of KM within the organization. Similarly, there are a number of standards which outline models of KM and explain how different components should be linked to create a successful KM model. For example, the Australian Standard highlighted five elements for successful KM model, namely organizational strategy, capabilities and culture, drivers, enablers and elements. Enablers are the techniques, tools and approaches, which managers of different organizations use to facilitate organizational employees.

It is important to mention here that the principal objectives of such standards give the organizational direction through organizational strategy. Therefore, organizations should ensure that their KM strategies are aligned with principal organizational strategy. This will ensure that KM not only facilitates the organization to drive its performance but also contribute to ensuring the achievement of organizational goals and objectives. To ensure the successful implementation of KM and to reap maximum benefits from it, organizations must ensure the balance between the four components, namely people, process, content and technology by considering organizational demands. According to <u>Attia and Salama (2018)</u>, KM capabilities include knowledge infrastructure capabilities and knowledge process capabilities. Both infrastructure and process capabilities jointly signify organizational ability to build internal culture, structure and processes so that organizational capabilities can be enhanced. The knowledge process capability is the organizational capability to convert tacit knowledge into explicit knowledge, resulting in the creation of new knowledge. It also transforms the organizational knowledge.

The infrastructure capabilities of KM represent organizational tools and designs which facilitates organizational KM activities. Organizational culture, structure, information and communication technologies are some of the examples of organizational infrastructural capabilities for KM. Each business has a principal strategy which drives organizational activities. Dynamic organizations supplement and provide support to a principal strategy with subsequent strategies. KM has critical importance for a successful business strategy. To become a successful and dominant organization, dynamic organizations link KM strategies with business strategy so that they can enhance their workers' and organizational effectiveness (Smith, Mills, & Dion, 2010).

The literature provides a number of studies where different researchers highlighted different perspectives on the success of KM. According to <u>Jennex (2009)</u>, the success of KM is a process which involves different elements, such as availability of resources within the organization which will facilitate the creation of new knowledge, acquisition of knowledge from different sources, sharing of knowledge, utilization of an application of knowledge so that organizational goals can be achieved. The KM will be considered as successful if it efficiently contributes to the effectiveness of business growth and operational processes.

Another indicator of KM success is the end result of organizational activities, such as improvement in quality of product and service by considering all stakeholders' views, enhancing organizational productivity, introducing new product and services through innovation, effective knowledge about market to become more competitive, having upto-date knowledge about customer's expectation and ensuring its compliance to achieve their satisfaction. The success of KM also represented by workers' satisfaction with respect to information availability, tools, techniques and infrastructure for communication, an organizational culture of information and knowledge sharing and acquisition.

According to <u>Wong (2005)</u>, the success of KM is represented by a number of dimensions. For this purpose, organizations must ensure that they acquire the right knowledge from the right person and made it available for the right person so that he/she can use it in the right manner. If these processes are performed as per the criteria, most likely organizations will experience enhancement in their performance. According to <u>Jennex</u>, <u>Smolnik and Croasdell (2009)</u>, the success of KM is measured through its impact on business processes, business strategy, leadership commitment and its content. A number of researchers, such as <u>Barão, de Vasconcelos, Rocha and Pereira (2017)</u>, <u>Alavi and Leidner (2011)</u>, <u>Jennex (2009)</u> and <u>Beijerse (2000)</u> said that KM has the potential to improve product quality from its development processes. It also facilitates firms to become more innovative, customer focused and develop a strong relationship with employees, customers and all stakeholders.

<u>Skyrme (2008)</u> proposed a mechanism named as KM benefits tree. KM benefits tree is an effective mean which shows the linkage between different benefits. It is divided into three columns, namely knowledge benefits, intermediate benefits and organizational benefits. Each benefit/column has four sections. The KM benefit tree has the potential to provide understanding to senior executives and managers about the bottom-line advantage of KM. Considering these advantages, top management decides to make investment in KM activities. In general, initiating KM system requires infrastructure where the cost can easily be measured. However, the benefits of investing in KM are technically invisible but spread throughout the organization. KM tree helps managers to visualize the unseen benefits immediately through a broad network of steps.



Figure 17: KM benefits tree by Skyrme (2008)

• Knowledge Benefits: The knowledge benefit section contains four sections, namely access to the best thinking, ensuring prompt access to knowledge, efficient knowledge and information sharing, and having awareness about the activities of employees and their performance. It relates to benefits originated from efficient utilization of knowledge, such as eliminating unnecessary information so that workers' efforts to find the right information can be minimized, resulting in saving of time.

• Intermediate Benefits: The intermediate benefits section is also comprised of four sub-sections, namely novel ideas and approaches, prompt solution of problems, deploying new people having new knowledge, and elimination of duplicate information and knowledge. This section focuses on expressing organizational knowledge benefits in the form of efficiency and effectiveness. The intermediate benefits are two-way, having backwards and forward integration. It is backwards integrated with knowledge benefits and forward integrated with organizational benefits.

• Organizational Benefits: The organizational benefits column is also divided into four sub-sections, namely prompt and better innovation, improved customer

services, minimizing the loss of knowledge and enhancing productivity and performance. The fundamental focus of this section is on achieving organizational goals through enhanced productivity, improvement in quality and achieving customer satisfaction.

4.10 - Critical Factors for KM success

Considering the fact that modern firms have understood the importance of knowledge and KM, however, the implementation and success of KM program is a real change. According to <u>Wong (2005)</u>, in the present era firms have become more knowledge-intensive and give more importance to KM. For this reason, managers prefer those strategies which leverage knowledge. <u>Drucker (2004)</u> said that over the years, firms have realized the importance of knowledge workers. By the term 'knowledge worker', Drucker refers to those workers who actively participate in innovation activities.

Considering the importance of KM and to streamline it in organizations, a number of researchers and practitioners have performed a variety of studies to investigate the factors critical for the success of KM. The critical factors for KM success are those elements which require special attention and commitment of top management so that organizational goals and objectives can be achieved. In this section, we will be discussing those factors which have largely been highlighted in a variety of studies.

4.10.1- Technological Infrastructure

KM management is an intangible activity which is supported by tangible equipment, such as technological infrastructure, which enables the flow of knowledge throughout the organization and empowers workers to share their knowledge with others and acquire new knowledge. The technological infrastructure includes internet, intranet, software and programs which permit the exchange of information, facilitate daily operations, and also assist the top management to make effective decisions (Al-Alawi et al., 2007; Pandey & Dutta, 2013).

To obtain maximum benefits from KM, the leadership should ensure that the KM mechanism and system being implemented and used in their organization is simple to

understand and user friendly. Such systems must be suitable for users and incorporate standardized knowledge catalogue and structure (Abbas, Muzaffar, Mahmood, et al., 2014). Taking into account the broader element to the success of KM, <u>Gold, Malhotra and Segars (2001)</u> termed information and communication technology as a key factor which promotes knowledge flow in the organization.

4.10.2 - Process and Activities

KM include different processes and its success depends on the execution of those processes. With respect to knowledge infrastructure, the effectiveness of KM comprises of the division of roles and responsibilities among the workers in the form of team or individual capacity (Heeseok & Byounggu, 2003). KM processes also build and enhance existing capabilities of workers and enhance workers' capabilities by adding new competencies (S. M. Tseng, 2014). As stated earlier, KM is a system which includes different processes and framework to identify required knowledge, create new knowledge, acquire the missing knowledge, share and transfer the available knowledge with colleagues and apply the available knowledge in systematic manners.

To achieve KM objectives, the management should ensure the coordination between the processes and develop a mechanism which facilitates all these processes. According to <u>Holsapple and Joshi (2000)</u>, organizations can incorporate KM processes in their daily operations. To do this, the organization should ensure the identification of knowledge sources and make it easily accessible for workers either through technological databases or through individual personal interaction. This will facilitate the workers for ongoing learning at different stages. It will also motivate and encourage workers to ask questions about what they don't know, and will also motivate them to learn new things (Barão et al., 2017).

4.10.3 - Top Management Commitment

Leadership and top management commitment have central importance in all organizational activities. If an organization wants to take any initiative, the leader's backing is essential for its success. Similar to other systems, leaders' commitment is indispensable to create and share the culture of KM. Leaders have the potential to motivate workers to create new or share the available knowledge with others (Bryant, 2003). The top management can demonstrate its commitment with KM through regular communication with employees about the importance of KM for organizational success.

Knowledge oriented leaders benefit from KM to set organizational direction, developing goals and objectives, formulating strategies to achieve those goals, communicating to workers' about the importance of KM to achieve organizational goals (Ives, Torrey, & Gordon, 1997). Moreover, ensuring the availability of funds and required infrastructure also symbolize top management commitment with the KM processes (Donate & Sánchez de Pablo, 2015). In addition to this, the top management of organizations should demonstrate positive behaviour, such as participation in knowledge sharing and motivating others to share their know-how. This will make the workers ensure the free flow of knowledge throughout the organization, active learning of workers, the establishment of a knowledge network and finally the development of workers' skills (Merat & Bo, 2013).

4.10.4 - Organizational Culture

An organizational culture which supports KM gives the highest value to knowledge workers (Al-Alawi et al., 2007). Organizations with strong knowledge culture encourage the workers for the creation of new knowledge, facilitate the acquisition of knowledge within and outside the organization, and motivate workers to share their knowledge and expertise with others so that they also can have a better understanding to perform their job. Such organizations also create a culture of learning by doing. The literature indicates that learning organizations promote knowledge-friendly culture as they integrate the set of values and belief on the methods of organization to facilitate their workers to innovate new things and try new methods to perform their jobs (Breznik, 2018).

The culture of knowledge-oriented organization makes its employees become more competitive and inclined to knowledge sharing and acquisition. Such activities have great value for other workers, having less knowledge and experience (Mahmood et al., 2014; Ooi, 2014). To promote the culture of knowledge, it is vital to build an atmosphere of trust among the workers. A number of workers in organizations have great knowledge and experience. However, they are reluctant to share it with others because of their fear of lose their value and importance (Habib, Abbas, & Noman, 2019). Here, leaders can play an important role. They can motivate such works to consider knowledge sharing as their moral responsibility. Leaders also can help them to link such workers' goals with organizational goals. The achievement of organizational goals will also facilitate workers. The more collaboration and coordination exist between the workers, the higher level of trust between them will exist (Holste & Fields, 2010).

4.10.5 - Organizational Structure

Organizational structure refers to the arrangement and division of tasks, jobs and responsibilities. It also refers to how the people and seniors coordinate and supervise workers' performance so that organizational goals and objectives can be achieved. Considering the dynamics of the modern business world, learning organizations use to remain flexible and open to learning new things so that they can become efficient, innovative and productive. Organizational structure also refers to the perspectives through which employees perceive their firm and the working environment. Generally, a bureaucratic firm contains a number of division or management layers which characterize the workers' responsibilities. It also formulates a huge reporting criterion which causes a delay in the flow of information and consumption of more time and human efforts (Vitari, Moro, Ravarini, & Bourdon, 2007). Organizations with a strong division of structure demonstrate position-based standing and authority which, most of the situation, hurdle the productivity of workers, resulting in a reduction of organizational performance.

Organizations with few management layers enjoy the ease of knowledge and information flow among the senior management and middle and junior managers (Rowley, 2007). Similar benefits are also enjoyed by junior workers. Firms which empower their middle and junior level workers enjoy more loyalty of their workers as

workers in such companies feels the ownership and take initiatives to achieve KM objectives as their responsibility (J. Darroch, 2005). Similarly, organizations which aim to achieve excellence in their operations design its structure in the manner which boosts their workers' knowledge and learning capabilities (Rose-Ackerman, 1996).

4.10.6 - Organizational Knowledge Strategy

Dynamic **o**rganizations link their KM strategies with their goals and objectives. Such strategies clearly articulate how they will add value to the organization and how the workers will be benefited by it. Organizations which carefully design their strategies and make a clear and well-planned division of roles and responsibilities have the tendency to build a strong foundation for enriching their workers' capacities and efficient utilization of resources so that organizational goals can be achieved through KM. Modern organizations define the key domains and fundamental values of knowledge so that organizational processes can be enhanced. Through organizational strategy, firms also make sure that key organizational issues are being incorporated with business principal strategy (K. Y. Wong, 2005).

4.10.7 - Training

Training refers to teaching or developing individual skills and knowledge which exclusively focus on specific competency. Organizations provide training to its workers with specific goals, such as improving their capabilities, productivity, capacity and performance. Dynamic organizations take training as a continuous and ongoing process (Sarkis, Gonzalez-Torre, & Adenso-Diaz, 2010). Considering the changing business trends and highly competitive business situation, organizations not only provide basic training to their workers, such as trade and skills development, but also go for professional development (Raddon & Sung, 2016). Such training enables managers as well as workers to perform their responsibilities in creative manners. It also facilitates workers to become effective and support KM activities within the organization.

Learning organizations focus on developing their human capital through training and development program (Senge, 1990). Such initiatives not only build their human capital, but also add to organizational intellectual capital. Through training, organizations enhance their workers' understanding of the importance of KM and how knowledge should be conceptualizing. Training also facilitates workers to design a common framework for knowledge throughout the organization, resulting in increased awareness among the workers about the need of KM.

According to <u>Cardoso</u>, <u>Meireles and Peralta (2012</u>), organizations should ensure that the training being provided to employees integrates KM elements. For example, explaining the workers the importance of knowledge sharing with colleagues, use of tools and techniques for knowledge management. According to <u>Barrett</u>, <u>McGuinness</u>, <u>O'Brien and O'Connell (2013</u>), training enhances workers' skills and foster their creativity and innovation level. It also encourages them for social networking, team building, peer learning and collaboration. <u>Calantone</u>, <u>Cavusgil amd Zhao (2002)</u> stated that training foster workers' communication skills and develop a problem-solving attitude in them.

4.10.8 - Human Resource Management

Human resource management (HRM) refers to people working in the organization as well as the organizational department responsible for managing the workers' record and performance (Izvercian, Radu, Ivascu, & Ardelean, 2014). In 1960 the term human resource was used for the first time. This term was linked with the importance of workers, their motivation level to work, organizational behaviour and the emergence of selection and evaluation criteria (Turos & Strange, 2018). Hence, it can be said that HRM is a strategic approach which enables the organization to manage their worker and their performance effectively. This will enable the business to achieve a competitive advantage. Organizations design human resource strategies to maximize their workers' performance (Schneider, Gunther, & Brandenburg, 2010). Therefore, it can be said that the principal aim of HRM is the management of people within the organization with respect to organizational policies and strategies.

Human resource department evaluates workers' performance, and design benefits for outstanding performers (Nejati, Shahbudin, & Amran, 2010). Modern

organizations give the highest importance to human resource section as it not only monitors the workers' performance, but also develop their capabilities to become more innovative and productive (Pinto & He, 2018). Human resource department enables the process of change and its success within the organization. Learning organizations link their human resource strategies with KM strategies (V. H. Lee et al., 2012). A focused and comprehensive human resource system ensures the recruitment and selection of the right candidate and develop their capabilities through development programs.

4.11 - Knowledge Management Flowchart

KM flow means the progress of knowledge from one stage to others. Although, different people have identified the KM flowchart in different manners, most of the people believe that KM flows in the cycle of four stages, namely knowledge creation, knowledge acquisition and retrieval, knowledge transfer/sharing, and knowledge application.

4.11.1 - Knowledge Creation

Knowledge creation or generation of knowledge is the first phase of the KM flowchart. Some researchers, such as <u>Demarest (1997)</u>, have also termed knowledge creation as knowledge construction or knowledge generation. It is considered as the most important stage in the knowledge management process, as all other processes, such as knowledge acquisition, knowledge sharing and knowledge application, are performed after the creation of knowledge. Considering the primary position of knowledge creation, <u>Drucker (2004)</u> said that in the modern economic system where knowledge has critical importance and a prime source of competitive advantage, only those organizations can survive which can efficiently manage their knowledge creation includes the identification of explicit knowledge as well as the acquisition of tacit knowledge, residing in the mind of people. The acquisition of knowledge enables knowledge to become part of the organization.

In the knowledge creation stage, new concepts, processes or ideas are generated by considering the already existing pattern. According to <u>Nonaka (1994)</u>, knowledge creation refers to the development of new or enrichment or replacement of already available knowledge with the new knowledge. In another study, <u>Nonaka and Takeuchi</u> (<u>1995</u>) said that the creation of knowledge involves the addition of new knowledge, refinement of existing knowledge or enriching the old knowledge and improving it with the help of new knowledge. Dynamic organizations facilitate their employees to benefit from the acquired knowledge and create new process by pondering on the existing knowledge (Alavi & Leidner, 2011). Firms create new knowledge through research and development activities. The identification of gap plays a significant role in the creation of new knowledge.

Dynamic firms collaborate with academic institutions and share their expertise with them so that their collaboration can help both to introduce new tools and techniques which would be of benefit for all. For this purpose, a number of organizations around the world provide a significant amount of funding to higher education and research institutions. After the creation of new knowledge, it not only enhances individual learning, but also provides a boost to collective learning, such as team or organizational level learning. This relation has been confirmed by <u>Su</u>, <u>Hsieh and Liu</u> (2003) that knowledge creation activities positively impact on organizational learning abilities. However, to achieve this objective, an appropriate and comprehensive individual learning mechanism is required so that individual learning can be transformed into team learning, leading to organizational learning.

Lettieri, Borga and Savoldelli (2004) stated that the knowledge creation stage also includes the codification of knowledge. The aim of codification is to organize and convert the newly created knowledge in a format which easily can be understood by the people and can be stored in a specific medium. Through the codification, organizations also determine which goals to be achieved through which strategy and evaluate its appropriateness and usefulness. Knowledge is stored in repositories, such as databases, books, manuals and in the minds of people. The retrieval of knowledge includes accessing the codified knowledge and sharing it with others in an effective manner. Dynamic organizations train their employees on how to access the right information and how to use it in the right manners. It is imperative for KM practitioners to consider technology, people and processes, all together (Abbas et al., 2015).

4.11.2 - Knowledge Acquisition

The second phase of the knowledge cycle is the acquisition of knowledge. Firms acquire knowledge mainly from two channels. The prime source of knowledge acquisition is individual interacting with customers, suppliers and general stakeholders. Such people have a better understanding of their needs and want (Hartenian, 2003). The second source of organizational knowledge acquisition is firm interaction with another firm. This is also known as intra-organizational learning. Dynamic firms learn from each other through a healthy competitive environment. Another traditional way of knowledge acquisition is congenital or inherited knowledge which firms received from their founding persons and it keep on passing to other members of the organization. Dynamic organizations encourage their employees to work as a team (P. Lee, Gillespie, Mann, & Wearing, 2010). When workers perform their job on collective manners, they interact with each other. This interaction enables them to acquire and share their knowledge with others.

The knowledge acquisition process focuses on obtaining knowledge from internal as well as external sources. For this purpose, access should be provided to knowledgebased resources so that new knowledge can be captured and available knowledge can be exploited. Firms acquire knowledge through two activities, which is searching and learning. Firms search knowledge through focused research, scanning and performance monitoring. In the learning activity, firms fundamentally involve themselves in knowledge acquisition activities as learning is essential to growing. <u>Drucker (1993)</u> said that knowledge acquisition involves learning by knowledge workers. <u>Argyris (999)</u> mentioned two forms of learning, namely single loop learning and double loop learning. <u>Senge (1990)</u> said that learning organizations have great capability to generate and adopt learning resources.

When individuals acquire knowledge from different sources, it not only benefits him/her in his/her personal capacity, but also facilitates the organization to improve its

performance with respect to productivity, creativity, quality, efficiency and effectiveness in all aspects (Hartenian, 2003). In other words, it can be said that organizational knowledge acquisition activities significantly improve their operational performance (Liu & Liu, 2008). <u>Huber (1991)</u> said that organizational learning occurs when a firm process and benefit from the information and improve its behaviour and culture by benefiting from acquired knowledge. After the acquisition of knowledge, firms document and embed it in organizational processes through its databases, manuals, and handbooks. This is because document knowledge is easier to share and distribute to other members of the organization. In this regard, information and communication technology plays a vital role.

As per knowledge conversation model by <u>Nonaka</u> (<u>1994</u>), a documented knowledge relates to externalization mode of the SECI model. The more the knowledge is documented and codified, the more it becomes easy to share it with others. Considering this element, it can be said that the level of knowledge documentation significantly impacts on the learning capabilities of individual, team and firm. Moreover, according to <u>Su, Hsieh and Liu (2003</u>), organizational ability to store knowledge has a direct relation with its learning attitude. Information technology helps firms to retrieve the stored knowledge so that people within the firm can use it for their operations.

The literature provides a number of different terms for knowledge acquisition, such as knowledge finding, seeking, catching, obtaining etc. however, a common objective is to accumulate knowledge. <u>Gold, Malhotra and Segars (2001)</u> said that knowledge acquisition is a process of accumulating knowledge. <u>Hartenian (2003)</u> said in knowledge acquisition activity, firms focus on capturing and accumulating knowledge through observation and previous experiences. According to <u>Nonaka and Takeuchi (1995)</u> and <u>Gold, Malhotra and Segars (2001)</u>, innovation is one of the significant parts of knowledge acquisition. In this activity, new knowledge is generated by applying existing knowledge. However, organizational ability to do so depends on a number of factors, such as absorptive capacity, realization and obtaining knowledge from different sources.



Figure 18: The knowledge management cycle

Although the literature provides valuable information about knowledge acquisition activities, some researchers, such as <u>Nonaka and Takeuchi (1995</u>), termed knowledge acquisition and knowledge creation as a similar process. <u>Davenport (1994)</u> said that organizational knowledge acquisition and creating value from it depends on a number of factors, such as the ability to integrate it, organize, structure and filter it. The knowledge acquisition process through knowledge creation can be analysed from ontological and epistemological dimensions.

- The Ontological Dimension: This dimension believes in the acquisition of organizational knowledge to improve the existing knowledge created by individuals. Such created knowledge is crystallized in the simulated network of knowledge.
- The Epistemological Dimension: This dimension believes that knowledge is derived by creating the distinction between explicit and tacit forms of knowledge. Most scholars, such as Nonaka and Takeuchi, support this view of knowledge

4.11-3 - Knowledge Sharing

The literature provides similar meanings to knowledge transfer and knowledge sharing. According to <u>Yang (2007)</u> and <u>Turyasingura (2011)</u> when knowledge is shared across companies it is called knowledge transfer; however, when knowledge is shared between individuals within the organization it is called knowledge sharing. For the present study, knowledge sharing refers to the dissemination of knowledge among individuals, teams and organizations through all available channels. Transfer of knowledge is the dissemination of knowledge in the firm. Knowledge must be shared and distributed throughout the firm so that it can be used in different activities, at different levels (Bhatt, 2001). Persons share knowledge with their colleagues through different means, such as sharing ideas, belief, thoughts and experience. The aim of this sharing is to complete the task through teamwork or at the individual level.

The success of knowledge sharing largely depends on receivers' absorptive capacity and the ability to apply it. Organizational knowledge absorptive capacity largely influenced by sources of knowledge, environment and relevance of knowledge (Holste & Fields, 2010; Shahzad et al., 2019). The transfer of knowledge within the organization is significantly influenced by organizational culture, technological advancement of the firm, people and procedure. Individuals transfer knowledge when they are willing to assist. They also transfer the knowledge with the aim to learn from others so that new skills and competencies can be developed. The interaction between people, procedures and organizational technology have the potential to make a direct impact on the effectiveness of knowledge transfer. A key concern in knowledge transfer is that it should be presented in good manners. Knowledge presentation means that the knowledge available to others for their use should be easy to understand, presented in order, allow users to rearrange and integrate knowledge content (Lettieri et al., 2004).

In the view of <u>Senge (1990)</u>, individual learning relates to its ability to absorb, digest and apply the newly acquired knowledge. Knowledge transfer process helps individuals to diminish the unnecessary knowledge areas or individuals and pay attention to significant fields. Such concentration on specific areas of knowledge

enhances the probability of its applicability, thus increasing the individual contribution towards organizational effectiveness. <u>Yang (2007)</u> studied the importance of knowledge transfer in international hotels and concluded that knowledge transfer in International hotels in Taiwan enhances their abilities to transform their collective knowledge and link them with organizational knowledge. Moreover, if firms do not encourage the knowledge sharing activities in their operations it will depreciate their value. In addition to this, knowledge sharing in firms leads to the development of learning activities in the organization. <u>Spinello (2000)</u> said that organizational learning and knowledge sharing are complementary and linked to each other.

4.11.4 - Knowledge Application

The application of knowledge refers to organizational activities to create new values by making knowledge more relevant to all users' fields. Different researchers have used different terms for knowledge application. For instance, <u>Davenport and Prusak (1998)</u> used the term knowledge utilization. <u>Demarest (1997)</u> termed it as knowledge use, and some researchers also referred to it as knowledge reuse. The literature also represents knowledge application as the utilization of the knowledge. <u>Anderson (2009)</u> termed knowledge application as the organizational ability to learn from past experience and mistakes and apply in their processes.

In their study, <u>Zack (1999)</u> said that knowledge cannot and should not be detached from its applications. This means that without application, knowledge is just a piece of information. <u>Nonaka and Takeuchi (1995)</u> said that knowledge application process starts with the acquisition of new knowledge and bringing it in use. A number of researchers focused on the use of effective KM or IT software so that knowledge can be applied in its best possible manner. In the view of <u>Schroeder and Pauleen (2007)</u>, knowledge application is a mechanism which enables firms to access knowledge. According to <u>Zwain (2012)</u>, the knowledge conversion process involves constructing knowledge so that it not only can be stored, but retrieved, disseminated and applied in KM processes. This indicates that knowledge application includes an effective
mechanism to extract knowledge which enables firms' employees to access required knowledge.

Dynamic firms transforms knowledge into action through its application, exploitation and embedding in their daily processes to produce high quality of products and services, make an effective decision, train their workers and solve the problems in innovative manners (Alavi & Leidner, 2011). According to <u>Debowski (2006)</u>, new knowledge is created and facilitated through the application of already available knowledge. To make the best use of existing knowledge, organizations must review it on a regular basis. This will have a positive impact on organizational performance.

<u>King, Chung and Haney (2008)</u> believed that the application of knowledge is done in a number of manners, such as the means of elaborations, comprehensiveness, joint problem-solving activities and innovation activities. Dynamic firms capitalize on available knowledge to develop new products and services. They also use it to improve the quality of their existing products, processes and service. As per the SECI model by Nonaka, the explicit knowledge is converted into tacit knowledge in internalization mode. The explicit knowledge, in such a process, can be embodied in practices and activities. <u>Sabherwal and Becerra-Fernandez (2003)</u> examined the impact of internalization activities on KM effectiveness at different levels, such as individual, group and firm level. As per their results, internalization significantly impacts on the effectiveness of individual-level KM. Moreover, the individual's perception towards the effectiveness.

4.12 – Green Innovation, KM and CSD

A number of researchers believe that SD is mainly driven by innovation. Through innovation, firms identify new techniques and ways to perform their operations. A group of researchers, such as <u>Montabon, Sroufe and Narasimhan (2007)</u>, <u>Wu and Pagell (2011)</u> and <u>Hofer, Cantor and Dai (2012)</u> mentioned that firms' commitment to environmental protection and its management enables them to become innovative and develop new tools and techniques to perform their operations in environment-friendly manners. <u>Wu and Pagell (2011)</u> viewed that innovation enables firms to perform their

operations better than their rivals, minimize their operational cost, increase their market share and achieve excellence in their operations.

Taking into account the importance of natural resources and sustainability, green innovation has taken central importance in organizational strategies and has become a strategic tool in achieving a competitive advantage, particularly in the manufacturing industries. The literature on green innovation provides different terminologies for this concept, such as ecological innovation, ecological technologies, green technologies, environmental innovation etc. These terminologies are used in different sectors and considered as interchangeable.

Most of the firms have paid inadequate attention to invest in natural resources and environment-friendly practices. However, with the increased social awareness about dwindling natural resources and strict ecological regulations by different international bodies, such as United Nations Global Compact (UNGC), firms are now forced to follow environment friendly practices and pay adequate attention to identify new means of production (Yu-Shan, Ching-Hsun, & Feng-Shang, 2012). These new means of productions are directly linked with green innovation. Considering the increased public awareness about environmental issues, <u>Oltra and Saint Jean (2009)</u> recommended using environmental attributes of products for marketing and differentiation.

Green innovation refers to innovation in products, processes and technological development that aims to facilitates firms to save energy, prevent pollution, recycle their waste, benefit from renewable energy and capitalize on practices facilitating firms to achieve effective environmental management. Firms can reshape the market competition scenario and can execute ecological differentiation strategies to achieve competitive advantage. However, this mainly depends on the firms' commitment to green innovation activities. <u>Oltra and Saint Jean (2009)</u> said green innovation consists of modified or new processes, products or systems that directly benefit the environment, rational use of natural resources, minimizes operational cost, resulting in economic and environmental sustainability.

According to <u>Fussler and James (1996</u>), ecological innovation refers to the development of new products or processes that adds value to business and significantly reduces the negative impact of organizational operations on the environment. <u>Kemp and Pearson (2007</u>) termed ecological innovation as the production, exploitation and assimilation of product, service, process or business management which are novel to the organization and results in reduced risk to the environment because of firm's operations. <u>Driessen and Hillebrand (2002</u>) followed pragmatic approach to explain green innovation and said it is not mandatory that green innovation must reduce the negative impact of organizational operations on the environment; but it must yield environmental benefits.

According to <u>Calza, Parmentola and Tutore (2017)</u>, there are two major elements which differentiate green innovation from traditional innovation i.e. specific externalities which green innovation has the ability to procure, and specific drivers which acts at its basis for development. With respect to externalities, <u>Rennings (2000)</u> said that innovation related to the environment results in double-externality issues, namely knowledge spill-over and higher cost. Another key difference in green innovation is the key role which it plays to drive its introduction. The general innovation is envisaged by technology push and demand-pull factors. It is important to clarify that green innovation can be in technological aspects as well as in non-technological aspects. It is mainly driven by environmental or economic forces by considering the needs to set the balance between stakeholders' and shareholders' interests.

Considering different definitions of green innovation, <u>Schiederig</u>, <u>Tietze</u> and <u>Herstatt (2012)</u> proposed six under mentioned different aspects of green innovation:

- Innovation in the method of product, process or service
- Satisfy the customers and stakeholders needs
- Diminish the negative impact of organizational operations on the environment
- Must be considered from resources acquisition to utilization level
- Aims to reduce operational cost

Setting new quality, green and innovation standards to the firm

The analysis of the literature indicates that different researchers have analysed green innovation from different perspectives and found mix results. For example, <u>Chen</u>, <u>Lai and Wen (2006)</u> analysed the relationship between green innovation and firm firms competitiveness and found a positive relationship between them. <u>Yu-Shan, Ching-Hsun</u>, <u>and Feng-Shang (2012)</u> said that green innovation has the great potential to enhance organizational products values. This enables to offset the cost incurred on environmental investment. Therefore, green innovation helps firms to improve their reputation and make it more successful. It can be said that green innovation results in a win-win situation for firms, society, government and all stakeholders.

With the passage of time, the importance of the green environment is increasing. The ratio of firms paying attention to green environment and green innovation is increasing. According to institutional theory, the firm's social objective should not be the profit maximization only, rather they should consider the impact of their operations on other stakeholders. There is a need that firms should obtain external stakeholders' trust through green innovation. The resource-based view (RBV) states that firms which pay proper attention to environmental social responsibility have better potential to take competitive advantage. Chen (2008) therefore suggested that environment management should be regarded as a unique competence from RBV perspective.

Firms investment in environment management activities have significantly been found helping them to protect the environment, achieve efficiency in their production operations, develop and introduce new markets related to the environment, resulting in enhanced R&D capabilities for the green business environment (Y. S. Chen, 2008). Green innovation is one of the most popular approaches to improve environmental performance and manage the natural environment. It focuses on improving the production processes, saving energy, protecting the natural environment from pollution, preserving natural resources and recycling of waste and concentrates on product design and processes so that efficiency can be achieved with respect to resources conservation. Therefore, according to <u>Gladwin, Kennelly and Krause (1995)</u>, a firm that concentrates on green innovation and environment management becomes the leader in

the industry by incorporating a new business model and introducing new ways to promote business.

KM plays central role in organizational innovation activities. In the view of <u>Sesay</u>, <u>Yulin and Wang (2018)</u>, KM acts as foundation for creativity, research and innovation activities. While examining the relationship KM and firm innovation activities, <u>Breznik (2018)</u> said that firms having strong KM mechanism has greater capabilities to innovate. KM greatly triggers organizational competencies to innovate. In their study, <u>Abbas and Sağsan (2019)</u> analysed the relationship between KM and corporate green performance through the mediating impact of green innovation and concluded that firms KM has significant and positive impact on corporate green innovation and green innovation mediates the relationship between KM and CSD.

It is commonly believed that the relationship between corporate social sustainability and firm performance is mediated by organizational innovation activities (Guerrero-Villegas, Sierra-García, & Palacios-Florencio, 2018). However, some researchers, such as <u>Li, Zhao, Zhang, Chen and Cao (2018)</u> said that in a number of scenarios green innovation negatively impacts on the financial performance of firms. For this reason, to encourage firms to adopt and invest in green technologies, they advised government to facilitate firms for investing in green technologies.

According to <u>Graaf and der Duinb (2013)</u>, knowledge sharing and collaboration greatly enhance firms potential to innovate. They further explained that those firms which work together and share their technical knowledge and experimental results has more potential to grow and innovate. While examining the relationship between KM and innovation in Malaysian manufacturing firms, <u>Yusr et al.</u>, (2017) said KM activities greatly enhance firms' product innovation activities.

4.12.1 – Types of Green Innovation

<u>Qi, Shen, Zeng and Jorge (2010)</u> classified green innovation into green technology and green management. In their study, <u>Siva et al.</u> (2016) also proposed the similar two dimensions for green innovation, namely green technological innovation (GTI) and green management innovation (GMI).

4.12.1.1 – Green Technological Innovation

GTI focuses on integrating ecological and environmental familiarity and knowledge with technological understanding. GTI greatly strengthen the organizational capabilities to introduce new products or processes. It also enhances firm's ability to modify or improve the existing product and processes. These modifications enable firms to save energy resources, ensure harmony between production activities, economic growth, society and the natural environment (Fernando, Jabbour, & Wah, 2019).

<u>Abbas and Sağsan (2019)</u> categorized GTI in green product and green process innovation. Both types of innovation have great potential to minimize the negative impact of firms' operations on the environment and enhance their economic and social performance through minimizing waste and operational cost (Kleindorfer et al., 2005). Firms who capitalize on green processes ultimately minimize their operational cost and production time.

4.12.1.1.1 - Green Product Innovation

Green product innovation focuses on introducing new or modifying the design of existing products by using recyclable / nontoxic materials in the production processes. Such innovation aims to minimize the dumping impact of industrial used material on the natural environment and achieve efficiency in organizational operations (Xie et al., 2019). So, it can be said that green innovation offers a new understanding of product life-cycle. As mentioned earlier, such innovation focuses on the efficient utilization of resources at all level; therefore, green product innovation concentrates on bringing reforms in product design from resources acquisition stage to manufacturing and distribution, and from usage to recycling or disposing of. In other words, green innovation brings improvements in the recyclability and durability of the product and significantly reduce the consumption of raw material in the production which result in environment-friendly activities.

4.12.1.1.2 - Green Process Innovation

The second type of GTI is process innovation which includes the introduction of new or modification of existing production or operation processes and equipment along with techniques to minimize the negative impact of organizational operations on the natural environment. In contrast to general process innovation, green process innovation results in safer and cleaner world, leading to significant externalities (Berrone, Fosfuri, Gelabert, & Gomez-Mejia, 2013).

The benefits derived from green process innovation can be divided into two categories, viz; short-term and long-term benefits. Firms' short-term benefits from green process innovation can be represented through financial performance, such as reduced operational cost, increased market share etc. while the long-term benefits represent the visibility of firms over a longer period of time and making it more competitive. Green process innovation also greatly enables firms to minimize their operational cost and control waste and pollution. Through green process innovation, firms can achieve efficiency in resources consumption and significantly reduce their production and operational cost.

4.12.1.2 - Green Management Innovation

Green product as well as green process innovations have critical importance in organizations and play a central role in societal well-being. However, both types of innovations are influenced by green management innovation by the adoption of novel management structure or organizational system which significantly improves the management or production activities that also reduces the negative impact of organizational activities (Qi et al., 2010). In GMI, organizations focus on restructuring their management system by adopting new policies and practices. Those practices are linked not only with improving the management practices, but also the production processes so that negative impact of management practices on natural environment can be minimized (Qi et al., 2010).

CHAPTER 5

THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

TQM and CSD, are believed to be the important sources to get and sustain competitive advantage as their practices are complementary to each other in many ways. TQM is a management philosophy which aims to satisfy customers' needs through continuous improvement of quality and processes. All improvement strategies, such as Deming cycle, ISO 9001 certification, Six Sigma, process management etc. aim to ensure customers' satisfaction and reducing organizational cost. CSD states that firms should consider the impact of their operations on the natural environment and the society where they operate.

It is evident from the previous chapters' discussion that TQM, CSD as well as KM, has gained substantial attention in academic as well as in the business environment. The rapid increase in the publications related to these topics can be taken as evidence of these concepts' importance. Although these studies contain valuable and insightful information that can help understand the relationship between TQM and KM, it is essential to advance these works using more methodologically rigorous research to clarify the pattern of the interrelationship between TQM, CSD, KM and green innovation empirically.

The present study claims that TQM and CSD are related to each other and TQM has the potential to boost the sustainability of firms. For example, TQM focuses on providing products and services of high quality with customers' and employees'

satisfaction, dignity, and loyalty. This inherently contains a set of moral and ethical values foundationally similar to CSD (Detert, Schroeder, & Mauriel, 2000; Wicks, 2001). Hence, TQM can provide support for organizations CSD activities. If the organization is not able to effectively implement TQM practices, there will be doubts about its CSD activities. Therefore, companies should implement them simultaneously and develop a valuable strategy for it. To achieve sustainable development goals, organizations must improve their processes on a continuous basis. Firms must capitalize on modern technology, equipment and human resource which enable firms to align their strategy and objectives to make change a valuable initiative.

Although there are studies which have investigated the relationship between TQM, CSD and KM in an isolated way and there is scare literature which simultaneously investigates these concepts (Benavides-Velasco, Quintana-García, & Marchante-Lara, 2014). Similarly, to the best of researcher's knowledge, the literature lacks to have any empirical study which simultaneously evaluates the impact of TQM and KM on organizational sustainability.

The present study aims to investigate the relationship between TQM and CSD through the mediating impact of KM. For the purpose of TQM, the author used six constructs of American Malcolm Baldridge National Quality Award. These six constructs are leadership, strategic planning, information and a lysis, human resource management, process management and customer focus. A number of other studies, such as <u>Ooi (2014)</u>, <u>Sila (2007)</u> and <u>Kaynak (2003)</u> have also used these variables in their studies. To measure CSD, the author adopted sustainable development theory which has three dimensions, namely economic, social and environmental sustainability. In the first phase of the study, the author analysed how TQM impacts on CSD. In the view of the author, the effective implementation of TQM can result in improved efficiency, elimination or reduction of bureaucracy, alignment of processes and goals which ultimately will lead to CSD. After that, the author performed dimensional analysis to investigate how TQM impacts on different dimensions of CSD, such as economic, social and environmental sustainability.

In the second phase of the study, the author analysed the relationship between TQM and KM and claimed that if firms implement TQM in a holistic manner, it will facilitate KM activities. However, for this purpose, both concepts should be planned in detail. Similar to CSD, the researcher also examined how TQM impacts on different dimensions of KM and proposed sub-hypotheses for different variables. Considering the important supportive role of KM, the author used it as a mediating variable as analysed how KM mediates the relationship between TQM and CSD. For this purpose, the author also examined how KM impacts on CSD and what is the impact of KM on different dimensions of CSD. KM is largely internally focused while CSD's focuses on internal as well as external stakeholders (Preuss & Córdoba-Pachon, 2009). KM and sustainability provide support to organizations and shares similar support functions' features. Finally, taking into account the role of KM in green innovation and CSD the author also examined how KM impacts on green innovation and what is the role of green innovation in CSD.

For the purpose of the current study, the following principal hypotheses are proposed:

- **H1:** Total quality management has a significant and positive impact on corporate sustainable development
- H2: Total quality management has a significant and positive impact on knowledge management
- **H3:** Knowledge management has a significant and positive impact on corporate sustainable development
- **H4:** Knowledge management significantly mediates the relationship between total quality management and corporate sustainable development
- H5: Knowledge management has a significant and positive impact on green innovation
- **H6:** Green innovation has a significant and positive impact on corporate sustainable development



Figure 19: Conceptual Framework

Taking into account the complexity and the dynamics of the business environment and the comprehensiveness of these concepts, the author decided to investigate the dimension-level relationship between the constructs and investigated how TQM impacts on different dimensions of CSD and KM and how KM impacts on different dimensions of CSD. For this reason, following sub-hypotheses are proposed:

- H1a: Total quality management has a significant and positive impact on environmental sustainability
- H1b: Total quality management has a significant and positive impact on social sustainability
- H1c: Total quality management has a significant and positive impact on economic sustainability

- **H2a:** Total quality management has a significant and positive impact on knowledge creation
- H2b: Total quality management has a significant and positive impact on knowledge acquisition
- H2c: Total quality management has a significant and positive impact on knowledge sharing
- **H2d:** Total quality management has a significant and positive impact on knowledge application
- H3a: Knowledge management has a significant and positive impact on environmental sustainability
- H3b: Knowledge management has a significant and positive impact on social sustainability
- **H3c:** Knowledge management has a significant and positive impact on economic sustainability

CHAPTER 6

RESEARCH METHODOLOGY

This chapter aims to explain the methodology and research design adopted in the current study and covers information about the target population, sample size, sampling design, research instrument, data collection, data analysis etc.

6.1 - Research Design

The current study follows an empirical approach and adopted the survey method to achieve its objectives as this approach is ideal to test the formulated hypotheses. Studies that following survey method are usually quantitative and require standardizing information about variables under study and explain their relationship in details. The author conducted a detailed literature review to explain the theoretical relationship between the variables. The current study aims to investigate the relationship between TQM and CSD through the mediating role of KM. For this reason, the present study uses relational survey design to investigate the relationship between the studied variables (TQM, KM and CSD).

6.2 - Research Population

The target population of the current study constitute medium and large manufacturing and services industries located in Pakistan. The author concentrated only on those firms which are registered on the Securities and Exchange Commission (SECP) of Pakistan and are having quality certificate, such as ISO 9001. The reason for

focusing only on quality certificate holders' firms is to find how quality management practices are enabling firms and workers to achieve sustainability and KM goals.

The author collected data only from managerial staff. For the current study, the term managerial staff refers to those people who are supervising the performance of at least ten other workers. The author approached junior, middle and top managers of manufacturing and services firms to share their views about the role of quality management practices being followed in their firms and how these practices are helping them to become a sustainable and environment-friendly organization. The reason for collecting data from management staff is that management is responsible for designing strategies, executing these and also have the best knowledge about their policies and practices.

The target population for the study includes five cities of Pakistan, namely Lahore, Islamabad, Faisalabad, Sialkot and Karachi. The author focused on only these cities since they are considered as leading business venues in the country. The data collection was done from April 2018 to July 2018 and managers of different manufacturing and services firms were approached through telephonic and electronic means. They were asked to respond and share their opinion about the performance of studied variables in their organization over a five-point Likert scale.

6.3 - Sampling Technique and Sample Size

In the current study, the author followed the non-probability convenience sampling technique to collect the responses. The reason for following non-probability convenience sampling technique is that it was almost impossible for the author to collect responses from all managers of manufacturing and services firms located in Pakistan. To estimate the sample size, the author followed <u>Hoelter (1983)</u> and <u>Hair, Anderson, Tatham and Black (2010)</u> recommendations. According to <u>Hoelter (1983)</u>, to perform factor analysis, the minimum number of responses should be two-hundred. The second technique followed in the current study for sample size was introduced by <u>Hair et al.</u>, (2010). According to them, the ideal approach for sample size is attaining the ratio of 5:1. This means that observations being conducted in the study should be five times more than the number of analysed variables. The current study used thirty-six items for

TQM, twenty-two items for KM, fourteen items for CSD, and eight items for green innovation, making a total of eight items with the ideal sample size of around four hundred, considering the 5:1 ratio. The author distributed six hundred and sixty-one (661) questions to managers working in different companies, thus exceeding the minimum number required by both techniques. The author received 442 responses out of which 431 were useable.

6.4 - Measurement Instrument

This study is mainly conducted to analyse how TQM impacts on CSD and how KM mediates this relationship. Considering the comprehensiveness of the constructs, the author benefited from a number of studies to design the measurement instrument. Details of different variables and their constructs are given below;

In the current study, the author followed the American Malcolm Baldridge National Quality Award (MBNQA) to investigate TQM constructs. MBNQA is one of the most popular quality awards in the world and has a number of dimensions. The current study used six dimensions of MBNQA award, namely leadership, strategic planning, customer focus, human resource management, process management and information and analysis. These dimensions have widely been studied by different researchers around the world. The author measured these six dimensions through thirty-six items extracted from <u>Saraph, Benson and Schroeder's (1989)</u>, <u>Kaynak's (2003)</u>, <u>Samson and Terziovski's (1999)</u> and <u>Sila's (2007)</u> studies.

Corporate sustainable development (CSD) refers to a firm's adoption of practices which not only positively impact on the natural environment, but also ensures firm to be socially responsible with enhanced economic performance. The current study used three constructs of CSD, namely economic, social and environmental sustainability. These three constructs have been measured through fourteen items. These items have been taken from Kaynak (2003) and Turker (2009) studies.

Knowledge management (KM) refers to availability of right information at the right to the right person so that right decision can be made. The KM scale was comprised of four constructs, namely knowledge creation, knowledge acquisition, knowledge sharing and knowledge application. These four constructs were measured through twenty-two items. The items for this section were taken from instruments developed by <u>Darroch</u> (2003), <u>Wang, Ahmed and Rafig (2008)</u> and <u>Lee and Wong (2015)</u> containing KM practices.

Green innovation refers to inventions which enable firms to minimize or eliminate the negative impact of their operations on the natural environment. The construct of green innovation has been measured through two dimensions, namely green technological innovation and green management innovation. The author measured these two dimensions through eight items (four for each dimension) which were obtained from <u>Wong (2013)</u> and <u>Kam-sing Wong (2012)</u>.

6.5 - Data Collection and Questionnaire Administration

Considering the above-mentioned dimensions, a self-administered questionnaire was designed to collect the data. In the first section of the questionnaire, demographic information of the respondents was taken, such as industry type, firm-size, gender, number of years of experience, age etc. In the second section, items pertaining to six dimensions of TQM were placed. The third section focused on CSD which was measured through three dimensions. The fourth section contained items related to four dimensions of KM. Finally, the fifth section had eight-items for two dimensions of green innovation.

Taking into account the <u>Hinkin (1998)</u> recommendation, the author pilot-tested the combined instruments on thirty-three firms located in Lahore. During the pilot-study phase, a couple of respondents talked about the length of the survey. However, considering the comprehensiveness of the study and a combination of different instruments, the author decided to use the full instrument. The initial result demonstrated the internal consistency of studied constructs and indicated a Cronbach's alpha value of 0.919. This internal consistency result fully comply with <u>Hair, Anderson, Tatham and Black (2010)</u> requirements of 0.7. On the basis of these results, the author initiated a comprehensive survey.

The author approached 661 different medium and large-sized manufacturing and services firms located in five different cities of Pakistan, namely Lahore, Karachi, Islamabad, Sialkot and Faisalabad. The author approached the managers of these firms through telephonic as well as electronic means to take an appointment for the survey. Instead of a personal visit, nine firms requested to courier or e-mail the study instrument and made a commitment to return it at their earliest convenience. Each firm identified one person responsible for giving feedback to the survey items. Out of 661 distributed questionnaires (including e-mails and personal visits), 442 responses were received. The received responses were entered into Statistical Package for Social Scientists (SPSS) software v.23. The detailed information about the demographics of respondents is given in Table 9.

Particulars	Description	Values	%
Total received	Medium organization	252	61.03%
	Large organization	179	38.97%
Gender	Male	266	65.26%
	Female	165	34.74%
Industry type	Manufacturing	244	58.61%
	Services	187	41.39%
Job Position	Lower management	186	47.13%
	Middle management	152	33.84%
	Upper management	93	19.03%

Table 4: Demographic of respondents

The data entry phase highlighted a number of incomplete responses. Moreover, the initial data screening led to the removal of 11 responses. Finally, the study provided a set of 431 useable responses for detailed data analysis. The author removed the missing or inconsistent responses because, according to <u>Roth and Switzer (1995)</u>, inconsistent and incomplete data may cause a problem in the statistical significance of the results. Moreover, missing data also negatively impact on parameter estimation. The author followed a list-wise deletion approach to remove the missing or inconsistent responses. In such a situation, all data of an individual entry missing critical information

is deleted. The overall final useable response rate of the study is 65.20% which is sufficiently good.

6.6 - Reliability of Data

The author evaluated the internal consistency of the data through Cronbach's alpha value. The ideal value for Cronbach's alpha should be higher than 0.7 (Nunally, 1978). The more the value is close to 1, the more the instrument is supposed to be reliable. As stated earlier, to enhance the reliability of the scale, the author performed pilot-study on 33 firms located in Lahore. The reliability of the pilot study ranges from 0.792 to 0.931. The reliability of comprehensive survey indicated 0.919 Cronbach's alpha value which fully complied with Peterson's (1994) minimum condition of 0.8 and <u>Hair et al., (2010)</u> and Molina et al., (2007) requirements of 0.7. The reliability of TQM constructs ranges from 0.842 to 0.916, for KM constructs 0.815 to 0.913, for CSD constructs 0.819 to 0.853, and for green innovation constructs 0.881 to 0.892. The details for each dimension' Cronbach's alpha value is given in Table 10.

Construct	ltems	Factor Loading Ranges	Composite Reliability ¹	AVE ²
Leadership	5	0.761-0.934	0.911	0.637
Strategic Planning	6	0.712-0.899	0.842	0.612
Customer Focus	7	0.742-0.919	0.847	0.613
Process Management	5	0.701-0.896	0.891	0.629
Human Resource Management	8	0.699-0.952	0.912	0.633
Information & Analysis	5	0.701-0.922	0.842	0.684
Environmental Sustainability	5	0.711-0.883	0.823	0.712
Social Sustainability	5	0.719-0.921	0.819	0.642
Economic Sustainability	4	0.821-0.945	0.853	0.648
Knowledge Creation	5	0.732-0.923	0.815	0.593
Knowledge Acquisition	5	0.706-0.914	0.899	0.621
Knowledge Sharing	6	0.698-0.942	0.913	0.636
Knowledge Application	6	0.724-0.895	0.879	0.661
Green Technological Innovation	4	0.791-0.913	0.892	0.689
Green Management Innovation	4	0.818-0.932	0.881	0.683

Table 5: Reliability and Validity of the Instrument

¹Composite reliability value should be ≥ 0.7 (Molina *et al.*, 2007)

²Average variance extracted (AVE) value should be ≥0.5 (Molina *et al.,* 2007)

6.7- Validity of Data

After the establishment of reliability, the second most important step is to ensure validity. According to <u>Babbie (1990)</u>, validity represents the degree to which empirical data/measure effectively evaluate and represents the actual picture of variables under study. In other words, validity represents the degree to which an instrument measures what it is supposed to measure.

For the purpose of the current study, the author followed the face as well as construct validity techniques to ensure instrument validity. For the face validity, the author approached eleven academic experts to review the wording of items for different constructs under study and analyse their clarity and degree to which they measure what they are intended to measure. The reviewers made a number of suggestions to rephrase different items and corrections were made according to their suggestions. For the purpose of construct validity, the author followed the factor analysis approach which resulted in the establishment of different constructs by considering variance explained and eigenvalues.

The author ensured validity through convergent and discriminant tests. According to <u>Molina, Llorens-Montes and Ruiz-Moreno (2007)</u>, for the purpose of convergent validity, the value of the average variance extracted (AVE) for individual constructs should be greater than 0.5. Moreover, according to <u>Hair et al., (2010)</u>, for convergent validity, each indicator should specify loading more than 0.7. The analysis of results indicated that all factors indicated loading more than 0.7 and factors values for AVE was also higher than the minimum threshold value of 0.5. The details of each factor loading and AVE results are given in Table 10.

After the assurance of convergent validity, the author analysed discriminant validity. According to <u>Awang (2012)</u>, discriminant validity empirically describes how much a construct under study is different from other constructs under study. In other words, it indicates whether the constructs under study are vastly correlated or not. In discriminant validity, the square root of AVE of the single construct is compared with the correlation among that particular construct and other remaining constructs. Awang stated that if the square root of AVE is higher than the correlation with other constructs,

it represents the existence of discriminant validity. According to Fornell and Larcker (1981), for discriminant validity, the covariance of the construct must be higher with its indicators than other constructs. Hair et al., (2010) also recommended the value of the predictor variable should not be higher than 0.9.

The empirical results given in Table 11 clearly indicate that all constructs under study comply with discriminant validity criteria recommended by Fornell and Larcker (1981) and Hair et al., (2010). Taking into account these results, it can be confidently said that the measurement, data and model adequately fulfil goodness conditions and contain benchmarked validity to analyse the formulated hypotheses.

Table 6: Constructs' Discriminant Validity and Correlation

	LD	SP	CF	PM	HRM	IA	KC	KA	KS	KAP	ENS	SS	ECS	GTI	GMI
LD	0.798														
SP	0.475	0.782													
CF	0.533	0.529	0.783												
PM	0.542	0.499	0.522	0.793											
HRM	0.462	0.520	0.483	0.511	0.800										
IA	0.465	0.498	0.542	0.531	0.553	0.827									
KC	0.495	0.586	0.593	0.455	0.518	0.524	0.770								
KA	0.483	0.557	0.498	0.534	0.486	0.435	0.583	0.788							
KS	0.513	0.607	0.510	0.481	0.543	0.469	0.524	0.489	0.797						
KAP	0.479	0.593	0.611	0.582	0.539	0.524	0.458	0.502	0.582	0.813					
ENS	0.593	0.488	0.483	0.527	0.472	0.485	0.621	0.531	0.452	0.442	0.844				
SS	0.603	0.612	0.532	0.614	0.495	0.468	0.485	0.456	0.485	0.492	0.532	0.801			
ECS	0.493	0.484	0.457	0.485	0.467	0.481	0.573	0.459	0.573	0.538	0.485	0.531	0.805		
GTI	0.512	0.564	0.543	0.531	0.563	0.553	0.523	0.492	0.573	0.536	0.544	0.493	0.543	0.830	
GMI	0.534	0.525	0.583	0.499	0.586	0.596	0.584	0.523	0.533	0.522	0.573	0.515	0.512	0.523	0.826

LD= Leadership, SP= Strategic Planning, CF= Customer Focus, PM= Process Management, HRM= Human Resource Management, IA= Information & Analysis, KC= Knowledge Creation, KA= Knowledge Acquisition, KS= Knowledge Sharing, KAP= Knowledge Application, ENS= Environmental Sustainability, SS= Social Sustainability, ECS= Economic Sustainability; Bold and italic values are AVE square root value for each construct

6.8 - Factor Analysis

According to <u>Ooi (2014)</u>, to perform factor analysis followed by SEM, the researcher must fulfil three prerequisite conditions, namely adequacy of sample size, analyse the non-existence of multicollinearity and non-existence of common method variance (CMV). As stated earlier, the researcher followed <u>Hoelter (1983)</u> approach for evaluating the sample size for factor analysis. According to Hoelter, to perform factor analysis, there must be at least a sample of two-hundred. <u>Hair et al., (2010)</u> suggested to have a sample of 5:1. This means that ideally the sample size should be five time

more than the number of items in the instrument. The present study has eighty items and, according to <u>Hair et al., (2010)</u> criterial, the ideal sample size is four-hundred. The current study has 431 useable sample which fully complies with <u>Hoelter (1983)</u> and <u>Hair et al., (2010)</u> requirements. In addition to this, the author also analysed sample size using Kaiser-Meyer, Olkin (KMO) Test. According to Kaiser and Rice's (1974), the minimum value of KMO test should be higher than 0.6. The KMO test indicated a value of 0.912 which is well above 0.6 minimum required value by Kaiser and Rice.

After ensuring the adequacy of sample size, the author analysed the multicollinearity. Multicollinearity is a situation in which high correlation or association exists between independent variables. Such high association results in a disturbance in data and can cause an issue in results' reliability. The existence of high multicollinearity increases the coefficient of the confidence interval and decreases statistics. In the presence of multicollinearity in the data, the rejection of the null hypothesis becomes difficult. Normally, multicollinearity is caused by adding variable which is calculated through other variables in the data, the inaccurate or improper use of dummy variable, repeating same variables time and again and when variables are highly correlated.

Multicollinearity can be analysed through different indicators. For instance, if the researcher does not get significant results for individual statistic and found significant results for overall statistics. This can cause the generation of mix results, such as significant or insignificant and also indicating the existence of multicollinearity. Researchers can also analyse multicollinearity by dividing the sample into two groups. If the coefficient of two samples drastically differ, it also represents the existence of multicollinearity. Another approach to identify multicollinearity is by using the variance inflation factor (VIF). VIF is one of the most popular approaches among researchers to identify multicollinearity. According to Hair et al., (2010), a value of VIF higher than 4 represents the existence of multicollinearity. Some studies also mentioned 10 as the maximum acceptable value for VIF. The analysis of VIF indicated a value of 2.958. This value fully meets the 4 maximum value recommended by Hair et al., (2010) and indicates the non-existence of multicollinearity.

After assuring the non-existence of multicollinearity, the author examined common method variance (CMV). CMV is the attributed to the method of measurement instead of to the constructs represented by the measures. This issue occurs with differences in responses produced by measurement instrument. For this reason, there can be contamination in results caused by the instrument. If the measurement instrument has CMV issue, the correlation between items or variables will either increase or decrease. Harman's single factor loading is one of the most popular approaches to analyse CMV. It is important to note that Harman's test is an approach to merely evaluate but not to control CMV. In this test, all items are loaded to one common factor. According to Podsakoff et al., (2012), if the results of all items' loading are higher than 50% on a single factor, it represents the issue of CMV. In this study, the analysis of CMV indicated 39.86% single factor influence that represents the non-existence of CMV issue in the data.

6.9 - Measurement and Structural Models Assessment

The measurement model, also known as the outer model, is used to identify the relationship between latent variables and their measures. In other words, it is used to describe the relationship between individual constructs and their indicator variables. Normally, in the measurement model, calculations for composite reliability, indicators' reliability, Cronbach's alpha value and convergent and discriminant validity is assessed. The structural model is the inner model which is used to describe the relationship between constructs. The Measurement model shows how different variables are linked and presents the theoretical foundation of the model.

Different researchers have proposed different indicators which represent the goodness of fit of measurement and structural models. However, chi-square to degree of freedom (χ^2 /df), normative fit index (NFI), comparative fit index (CFI), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) are the commonly reported indices. In addition to these seven indices, the author also reported Tucker-Lewis index (TLI) so that the goodness of measurement and structural models can further be ensured.

The χ^2 test is used to examine whether a significant relationship exists between two categorical variables or not. According to Byrne (1989), the acceptable value for χ^2 /df should be less than 2 while Bagozzi and Yi, (1988) suggested that the value to be less than 3. The analysis of the measurement model indicated 1.146 value which fully complied with Byrne (1989) and Bagozzi and Yi, (1988) requirements of less than 2 and 3, respectively. After χ^2 /df test, the author analysed NFI. The NFI measure is used to analyse the statistical model's goodness of fit. The goodness of fit of the model is measured by making a comparison between the model of interest and uncorrelated variables. One of the issues of NFI is that it can be affected by sample size. To overcome this issue, TLI is used that is similar to NFI, and is also another incremental fit index.

CFI is another important index which describes the goodness of model and considered as an improved version of the relative non-centrality index. CFI examines the extent of tested model's superiority over the alternative model. The GFI is used to analyse the fit between the observed covariance matrix and the hypothesized model. The result of GFI can be affected by the latent variable's indicators. To cover this issue, researchers use AGFI. The values of NFI, GFI, AGFI, TLI and CFI ranges from 0 to 1. According to Bagozzi and Yi, (1988), Bollen (1986) and Byrne (1989), values above 0.9 represents the ideal goodness of fit. RMSEA is yet another index which represents the fitness of the model. This index analyses the difference prevailing between the hypothesized covariance matrix representing the model and observed covariance matrix. According to Browne and Cudeck (1992), the ideal value for RMSEA is 0.08. Finally, the SRMR is the square root of the difference between the covariance model and sample covariance matrix with value less than 0.08 (Hu & Bentler, 1998).

The structural analysis indicated that the values for these fit indices adequately comply with different standards. For instance, NFI indicated 0.921 value, CFI indicated 0.959, GFI indicated 0.914, AGFI demonstrated 0.911 and TLI showed 0.961 result. According to Bagozzi and Yi, (1988), Bollen (1986) and Byrne (1989), the value for these indices should be more than 0.9. It is clear from structural results that the values for all indices fully comply with benchmark values. The analysis of SRMR and RMSEA

values indicated 0.0363 and 0.027, respectively. These values adequately comply with Hu and Bentler (1998) and 0.08 criteria for SRMR and Browne and Cudeck (1992) 0.08 criteria for RMSEA, respectively. Similar to the measurement model, the results of the structural model also indicated consistent results and complied with standards. The results for the measurement and structural models are given in Table 12.

	CMIN/D	NFI	GFI	AGFI	CFI	TLI	RMSE	SRMR
Recommended	≤3 ¹	≥0.9²	≥0.9²	≥0.9²	≥0.9²	≥0.9²	≤0.08³	≤0.08 ⁴
Measurement	1.146	0.92	0.91	0.91	0.95	0.96	0.027	0.0363
Structural model	1.151	0.95	0.97	0.96	0.95	0.95	0.031	0.0331

Table 7: Model Fit Measures

¹ (Bagozzi & Yi, 1988)

² (Bagozzi & Yi, 1988; Bollen, 1986; Byrne, 1989)

³ (Browne & Cudeck, 1992)

4 (Hu & Bentler, 1998)

6.10 - Analysing Hypotheses

Considering the complexity of variables and formulated hypotheses the author followed the SEM technique to analyse the hypotheses. SEM helps the researchers to interpret different factors as constructs or real variables underlying their items and link among them. This technique is perfect when the researcher wants to measure variables in perfect manners. It also facilitates researchers to analyse theoretical propositions in non-experimental data. SEM is a versatile multivariate statistical approach which facilitates researchers to evaluate the relationship between the latent variable and studied variable through CFA and path analysis. It has great strength to identify the causal relationship between exogenous and endogenous variables.

SEM uses two statistical analyses, namely CFA and multivariate statistical analysis. CFA is used to validate the indicators linked with constructs, while multivariate analysis provides a theoretical foundation given in the research framework and provides support for the conclusion. The credibility of the statistical conclusion is ensured by adding reliability and validity tests on theoretical constructs. Another advantage of SEM is that it is flexible and has the strength to tackle the multicollinearity issue. Through SEM, researchers can include multiple measures in the model which makes the model more stable. However, it allows only one variable to enter the equation.

In the path analysis, TQM indicated a significant and positive impact on CSD with 0.231 coefficient and 0.019 p-values. TQM also indicated a significant and positive impact on KM with 0.202 coefficient value and 0.031 p-values. KM indicated a significant and positive impact on CSD with 0.151 path coefficient and 0.031 p-values. KM also indicated a significant and positive impact on green innovation with 0.263 coefficient value and 0.008 p-values. Finally, green innovation also indicated a significant and positive impact on sustainability with 0.322 coefficient and 0.002 p-values. This led to the conclusion that main hypotheses H1, H2, H3, H5 and H6 are accepted.

Subsequent to testing above relationship between different variables, the author analysed the mediation effect to find how inclusion of mediator, also known as an intermediary or intervening variable, impacts on the relationship between the independent and dependent variable. In the mediation analysis, instead of a direct causal relationship between the dependent and independent variables, an intermediary is added and it is proposed that independent variable impact on the intermediary variable (non-observed variable) which ultimately leads to an impact on the dependent variable. Hence, it can be said that the mediating variable aims to elucidate the type of relationship between dependent and independent variables. The literature provides a number of types and techniques to analyse the mediation effect. Some of the popular techniques are <u>Baron and Kenny's (1986)</u> mediation steps, direct versus indirect effect, full versus partial mediation, Sobel test, bootstrapping method etc.

The author analysed the mediation effect by following Awang's (2016) recommendation of direct and indirect effect and confirmed it through bootstrapping. Awang suggested that to check the mediation effect, the researcher should first investigate the direct relationship between dependent and independent variables and the direct effect should be significant to show mediation. The direct effect of TQM on corporate sustainability indicated significant and positive result with 0.231 coefficient value, 2.216 composite reliability and 0.019 p-values. This direct significant and positive

result provided the foundation for testing the indirect effect for mediation. The author included a mediating variable, KM in the relationship between TQM and KM. The inclusion of the mediating variable reduced the direct effect of TQM on corporate sustainability to 0.159 with 2.119 composite reliability and 0.028 p-values. According to Awang, some portion of direct effect of TQM on CSD transferred through KM. For this reason, the direct effect of quality management on corporate sustainability reduced. Although the inclusion of KM as mediating variable reduced the direct effect of TQM on CSD, yet, the result still remained significant with 0.028 p-values. According to Awang, after the inclusion of the intermediary variable, if the result still remains significant, it represents the existence of partial mediation. This led to the conclusion that KM partially mediates the relationship between quality management and sustainable development.

The author also confirmed the existence of partial mediation through bootstrapping. Bootstrapping is a non-parametric test and was proposed by Preacher and Hayes. In bootstrapping, a different set of samples are selected on a random basis from the data set so that the desired statistic in each resample can be computed. The resample range vary from one hundred to one thousand, depending on the sampling distribution of researcher's interest. The author analysed the mediating role of KM in the relationship between quality management and sustainable development by performing bootstrapping with 1,000 resample size and 95% bias correction. The indirect effect of bootstrapping provided 0.029 composite reliability and 0.021 p-values, while the direct effect indicated 0.031 p-value and composite reliability value of 0.591. As the indirect effect is still significant, it confirms the existence of partial mediation. Therefore, the hypothesis H4, KM partially mediates the relationship between TQM and CSD is also accepted.

To analyse these variables relationship in detail, the author performed dimensional analysis and analysed the relationship between different dimensions. The dimensional analysis indicated an insignificant relationship between KM and social sustainability while all other dimensional hypotheses have been supported. The details of different dimensional hypotheses results are given in Table 13.

Table 8: Results of hypotheses testing

Hypothesis	Constructs	Coefficient	Critical	p-	Decision
H1	$TQM\toCSD$	0.231	2.216	0.019*	Supported
H1a	$TQM\toENS$	0.205	2.253	0.016*	Supported
H1b	$TQM\toSOS$	0.189	2.215	0.030*	Supported
H1c	$TQM\toECS$	0.273	3.624	0.001**	Supported
H2	$TQM\toKM$	0.202	2.194	0.031*	Supported
H2a	$TQM\toKC$	0.213	2.112	0.037	Supported
H2b	$TQM\toKAQ$	0.231	2.204	0.007^{*}	Supported
H2c	$TQM\toKS$	0.263	2.523	0.004*	Supported
H2d	$TQM\toKAP$	0.157	2.314	0.027*	Supported
H3	$KM\toCSD$	0.151	2.211	0.031*	Supported
H3a	$KM\toENS$	0.157	2.483	0.031*	Supported
H3b	$KM\toSOS$	0.149	1.771	0.061	Not supported
H3c	$KM\toECS$	0.192	2.315	0.027*	Supported
Mediation					
H4	$TQM\toCSD$	0.159	2.119	0.028*	Supported
	$TQM\toKM$	0.192	1.894	0.039*	Supported
	$KM\toCSD$	0.149	2.103	0.035^{*}	Supported
H5	$KM\toGI$	0.263	2.244	0.008*	Supported
H6	$\text{GI} \rightarrow \text{CSD}$	0.322	2.912	0.002	Supported
Control					
Firm size	$FS\toCSD$	0.048	2.011	0.046	Supported
	$FS\toENS$	0.139	1.545	0.128	Not supported
	$FS\toSOS$	0.139	2.035	0.041	Supported
	$FS\toECS$	0.019	0.376	0.697	Not supported
Industry type	Ind-Typ \rightarrow	0.031	0.291	0.683	Not supported
	Ind. Typ \rightarrow	0.041	1.973	0.042	Supported
	Ind. Typ \rightarrow	0.046	0.631	0.519	Not supported
	Ind. Typ \rightarrow	0.074	1.041	0.256	Not supported

*p≤0.05; ** p≤0.01; TQM= total quality management, CSD= corporate sustainable development, KM= knowledge management, ENS= environmental sustainability, SOS= social sustainability, ECS= economic sustainability, KC= knowledge creation, KAQ= knowledge acquisition, KS= knowledge sharing, KAP= knowledge application, GI= green innovation, FS= firm size, Ind. Typ= industry type.

CHAPTER 7

DISCUSSION AND CONCLUSION

This chapter focuses on providing a detailed discussion about results with respect to hypotheses of the study, explaining the role of control variables, highlighting the implications, detailing the limitations, proposing the directions for future researches and summarizing the study in conclusion.

7.1 - Discussing the Results

The current study is conducted with the aim to examine how quality management practices impact on corporate sustainability and how KM mediates the relationship between them. The author also examined how KM impacts on green innovation which further facilitates firms to achieve sustainability. The researcher focused on collecting data from manufacturing and services firms located in five major business cities in Pakistan, namely Lahore, Karachi, Islamabad, Faisalabad and Sialkot. The author selected only firms registered on the Securities and Exchange Commission (SECP) of Pakistan and having quality certification, such as ISO 9000. Following the nonprobability convenience sampling technique, the author approached the junior, middle and top managers of manufacturing and services firms located in above-mentioned cities to take their opinion about how different variables are linked together.

The construct of TQM has been examined through six dimensions, namely leadership, strategic planning, customer focus, HRM, information analysis and process management, and have been extracted from American MBNQA award. CSD has been measured through three dimensions, namely environmental, social and economic sustainability. KM construct has been measured through four dimensions, namely knowledge creation, knowledge acquisition, knowledge sharing and knowledge application. Finally, green innovation is analysed through green technological innovation and green management innovation.

7.2 - Relationship between TQM and CSD

The relationship between different variables was analysed through a multivariate statistical technique. This was facilitated by SEM as this technique has a great strength to analyse the causal relationship between the studied variables and build the hierarchy of latent constructs. The analysis of the structural relationship between TQM and CSD indicated significant and positive results. The empirical results indicated 0.231 coefficient value with 2.216 critical ratios and 0.019 significance value. The 0.019 p-value indicates that TQM has a significant and positive impact on CSD. This result is in line with the study of Todorut's (2012) who partially examined the relationship between TQM and Singh (2018) study which stated that TQM positively impacts on organizational performance. However, in their study, Li et al., (2018) analysed the relationship between TQM and corporate green performance in the manufacturing firms in China and found a negative relationship between them. For this reason, this result contradicts with Li et al., (2018) study.

This positive relationship indicates that sampled firms in Pakistan are adequately benefiting from TQM practices to achieve corporate sustainably. TQM is a management system which involves a number of constructs, such as leadership, strategy, customer focus, employees' participation etc. To achieve TQM goals, firms must implement these practices as a whole as a holistic approach in TQM enables firms to achieve short as well as long-term objectives. The successful implementation of TQM greatly depends on top management commitment. The <u>EFQM (2003)</u> model also placed leadership at the beginning level of TQM and stated that leadership enables other TQM factors, such as strategic planning, customer focus, human resource management etc. On the basis of this result, it can be said that the leadership of the sampled firms is showing adequate

commitment with the TQM practices and are also devoting adequate resources to link their quality strategy with overall business strategy.

In the view of the author, this significant relationship is grounded on the fact that TQM is a management system which focuses on continuous improvement (Kaizen). Firms achieve this goal through TQM by capitalizing on a set of practices, known as the core constructs of TQM, such as process management, customer focus, strategic planning etc. Through continuous improvement, TQM facilitates firms to achieve efficiency in resources consumption and also achieve operational excellence. These activities enable firms to become environment-friendly organizations.

During the last two decades firms, particularly the manufacturing businesses, are facing growing pressure to follow environment-friendly practices. In the capitalist era, firms used to consume natural resources to maximize their profit. Businesses across the world radially consumed different natural resources, such as water, oil, gas etc. which resulted in a sharp decline of these resources (Abbas & Sağsan, 2019). Moreover, the emission caused by firms has greatly damaged the natural environment, resulting in climate change, global warming etc. With the passage of time, these firms kept on expanding and increasing their production level which greatly damaged the natural environment. In the late nineteenth century, a number of ecologists started raising voice to counter this issue and follow environment-friendly practices. In 1987, the Brundtland Commission issued a report which highlighted the need for linking economic performance with environmental performance (UN, 1987).

<u>Elkington (1998)</u> added the third dimension to sustainability, namely social sustainability or responsibility and termed it as Triple Bottom Line (TBL). The United Nations Global Compact (UNGC, 2000) has directed firms across the world to ensure sustainability practices in their operations. Taking into account these practices and UNGC recommendations, the author performed dimension level analysis to investigate how TQM impacts different dimensions of corporate sustainability, namely environmental, social and economic sustainability.

The dimensional analysis indicated a significant and positive impact of TQM on all CSD dimensions, namely environment, social and economic sustainability. The path analysis of TQM on environmental sustainability indicated 0.205 coefficient value, 2.253 critical ratios and 0.016 p-values. This significant result indicates that TQM, as a management system has great strength to facilitate firms in achieving environmental sustainability. One of the key reasons could be the focus of TQM on continuous improvement through efficient utilization of resources. That is how the quality-focused firms focus on integrating quality strategy with the environmental management system to achieve environmental sustainability.

From the empirical results, it can be concluded that the sampled firms in Pakistan are substantially benefiting from TQM practices to achieve environmental sustainability and focusing on efficient consumption of resources through minimum waste. TQM and the management of the natural environment are highly related to each other as they both have similar long-term objectives. For this reason, these firms are able to achieve environmental sustainability objectives. According to Yuan and Xiang (2018) firms which pay attention to the impact of their operations on the environment and follow environment-friendly practices are the preferred choice of customers. For this reason, such firms also enjoy more customer loyalty.

TQM also indicated a significant and positive impact on social sustainability with 0.189 coefficient value and 2.215 critical ratio and 0.030 p-values. This significant result relates to the study of Kang et al., (2015) and Todorut (2012). Social sustainability received the least attention by the business community since its introduction. According to Shahzad et al., (2019), the reason for such low attention is that it is hard to measure this aspect. In the context of social sustainability, firms try to evaluate the impact of their operations, positive as well as negative, on the society. Firms dedicated to social sustainability take measures to counter the negative impact of their operations on society. They allocate a valuable amount of their resources to develop and promote their relationship with primary and secondary stakeholders. The aim of social sustainability is to enhance the life-standard of society and includes a number of topics,

such as social equality, participation in social development, health and safety, workers' or labour right, social justice etc.

The above significant results enable the author to conclude that TQM is significantly enabling the sampled firms to achieve social sustainability goals to become a socially responsible organization and the management of these firms are paying adequate attention to their role in social development. Firms which understand the importance of customers and relationship with them integrate their social participation and social development strategies with their prime business strategy.

The empirical analysis of TQM on corporate economic sustainability also indicated a significant and positive impact with 0.273 coefficient value and 3.624 critical ratio and 0.001 p-values. This result is in line with the study of Singh et al., (2018). In another study, Lasrado and Hafeez (2017) and Al-Qahtani et al., (2015) also identified a similar relationship. TQM indicated the highest impact on economic sustainability than social and environmental aspects. As per the author view, this is because TQM has a great focus on improving the operational performance of businesses, ensuring customer satisfaction, minimizing waste, training and development of workers etc. All these elements directly impact on the financial performance of firms. According to <u>Mahmood et al., (2014)</u> enhancing customer satisfaction, minimizing work the firms to achieve economic sustainability over the longer period of time.

The quality of product or service can help the firm to create and maintain a competitive advantage. However, this requires consistency in production and operation processes. Firms must understand that TQM practices are interdependent and, to achieve maximum benefit from TQM, they must apply these practices in a holistic manner. For this purpose, organizational leadership has to play a critical role. The top management or leadership of firms are responsible for designing strategies and objectives. They are also responsible for formulating operational plans. Therefore, to achieve sustainability leadership commitment with TQM and sustainability is essential, which, in the present study case, is also being demonstrated by the management of the studied firms.

7.3 - Relationship between TQM and KM

This section focuses on discussing the results pertaining to the relationship between TQM and KM. The analysis of TQM's impact on KM indicated a significant and positive impact with 0.202 coefficient value and 2.192 critical ratio and 0.031 p-values. This finding is harmonized with the study of Yusr *et al.*, (2017) in which they examined the relationship between different components of TQM and KM. In the daily business operations, firms have to make a number of decisions. They have to be updated about the market trends, customers' needs, competitors' activities etc. For this purpose, dynamic firms focus on having an effective KM system. KM facilitates firms to have the right information at the right time in the right format. This enables organizational workers to perform their tasks within least amount of time, in an efficient and effective manner. In their study, <u>Abbas (2014)</u> said that knowledge has great potential to improve the performance of workers. In another study, <u>Abbas and Sağsan (2019)</u> also that KM practices significantly impact on workers' innovation capabilities.

In the author view, one of the key reasons for this significant and positive relationship between TQM and KM is that TQM and KM share similar objectives. For example, TQM aims to achieve customer satisfaction by focusing on the identification and complying with their needs. It also focuses on process management, ensuring continuous improvements and designing an effective strategy to tackle market needs. All these elements are directly related to KM. For this reason, it is expected to have a positive relationship between TQM and KM in a quality committed group of companies.

After the establishment of a positive relationship between TQM and KM, the author performed dimensional analysis to investigate how TQM impacts on different KM dimensions. TQM indicated a significant and positive impact on all four dimensions, namely knowledge creation, knowledge acquisition, knowledge sharing and knowledge application. The path analysis of TQM's impact on knowledge acquisition indicated 0.231 value with 2.204 critical ratio and 0.007 p-values. This positive and significant result indicates that the sampled TQM firms are allocating adequate resources and making enough efforts to acquire knowledge from different channels.

Organizational employees acquire knowledge mainly through two channels, internal sources and external sources. One of the principal sources for acquiring knowledge within the firm is colleagues. Most of the workers acquire knowledge from their colleagues to perform their operations. They discuss their operational circumstances and issues faced by them with colleagues. This discussion helps them to get viable solutions and perform their tasks in effective manners. There are a number of external sources for knowledge acquisition and most popular are customers, suppliers, competitor and expert institutions. These internal and external sources of knowledge acquisition are directly linked with TQM, since TQM aims to achieve excellence in operations by focusing on customers, developing their employees, ensuring effective collaboration work with suppliers etc. On the basis of current study's finding with respect to knowledge acquisition, it can confidently be said that the sampled firms are paying adequate attention to knowledge acquisition activities and taking maximum benefit from TQM to achieve knowledge objectives.

TQM also indicated a significant and positive impact on knowledge sharing with 0.263 coefficient, 2.523 critical ratio and 0.004 p-values. The analysis of TQM's impact on knowledge application also demonstrated similar significant and positive results with 0.157 coefficient value and 2.314 critical ratio and 0.027 p-values. These significant results indicate that the experimented firms are effectively implementing the TQM practices and showing commitment to it. This commitment is facilitating the firms to achieve KM objectives. TQM and KM are interrelated concepts and dynamic firms do take them as inter-subjective concepts. TQM focuses on the development of employees by providing them with training and enhancing their knowledge and skills. By focusing on employees' development through KM activities, firms not only achieve excellence in their operations but also enhances their potential to achieve competitive advantage.

In the view of Hsu and Shen (2005), TQM and KM are related to each other and share some similar processes, such as result orientation, leadership, customer focus, and HRM. Such similarities form the basis of the interactive relationship between these two concepts (McAdam & Leonard, 2003). Organizations can also achieve SD objectives by meeting customers' as well as stakeholders' requirements on a long-term

basis. In this regard, TQM and KM can play a significant role as, with the help of knowledge workers, TQM and KM can strengthen the operational and financial sustainability of the organizations (M. L. Tseng, Lim, Tan, & Bui, 2017).

On the basis of the significant and positive association between TQM and KM constructs, it can confidently be said that TQM practices are greatly benefiting the sampled firms to achieve KM objectives. In the TQM based KM environment, organizations concentrate on the continuous restoration of resources to smooth the progress of the personal development processes of their members (Nonaka, 1994). The mega companies in Japan have placed a strong emphasis TQM along with KM processes as they focus much of their energy on their intellectual capital (human assets), which is one of the key elements in maximizing organizational financial and operational performance (Nonaka & Takeuchi, 1995). On the basis of these significant results, it can be concluded that the sampled firms in Pakistan are also paying adequate attention to TQM practices to achieve excellence in their operations, and they are linking TQM strategy with KM practices.

7.4 - KM, CSD and Green Innovation

In the modern, highly competitive, and dynamic environment, KM is seen as a critical factor for the success of businesses as it enables organizations to examine how and which strategy should be used in combination with others to enhance organizational efficiency. KM helps the organizations to investigate new products and services for their customers. This enables firms to achieve competitive advantage and lead the market. Effective KM system also results in increased performance for employees as well as the organization itself. Many organizations have a dedicated team for managing and creating knowledge (Yusr et al., 2017) as it has a vast impact on a company's strategic competencies.

The author analysed the relationship between KM and CSD through SEM. According to the structural analysis result, KM significantly and positively impacts on CSD with 0.151 coefficient value and 2.211 critical ratio and 0.031 p-values. This result is aligned with the study of <u>Abbas and Sağsan (2019)</u> who identified a significant and positive relationship between KM and firm sustainable performance. This result is also

in line with the study of <u>Shahzad et al., (2019)</u> in which they investigated the relationship between firms' knowledge absorptive capacity and its impact on sustainable performance through the mediating role of CSR and found significant and positive results. In another study Choi, Poon and Davis (2008) examined the effects of KM strategies on organizational performance and said that KM is one of the principal sources for creating new core competencies for organizations and enhancing their competitiveness.

The analysis of KM on different dimensions of sustainability indicated mixed results. As per the dimensional analysis, KM positively and significantly impacts on environmental and economic aspects of sustainability and indicated an insignificant impact on corporate social sustainability. The structural analysis indicated 0.157 path coefficient value for the direct impact of KM on environmental sustainability and 2.483 critical ratio and 0.031 significance values. Similarly, KM indicated 0.192 coefficient value for its impact on economic sustainability along with 2.315 critical ratio and 0.027 p-values. These significant results indicate that experimented firms are paying adequate attention to KM processes and this commitment is giving them gentle support to achieve sustainable development objectives. It is crucial for organizations to allocate adequate resources for creating new knowledge as it will lead to a competitive advantage for the organization. Dynamic and progressive organizations offer financial and non-financial rewards to employees who introduce new ideas or solutions. The creation of new knowledge directly impacts on the performance of the firm as, according to Roblek et al., (2014), KM positively affects the organizational sustainability and innovative performance.

The analysis of the mediation effect of KM between TQM and CSD indicated a significant and positive result, which led to the conclusion of the existence of partial mediation between TQM and CSD by KM. This partial mediation means that along with KM, there are also other factors which influence the relationship between TQM and CSD. KM also indicated a significant and positive impact on green innovation with 0.263 coefficient value and 2.244 critical ratio and 0.008 p-values. This significant result means that KM significantly enhances firm capabilities to innovate. This result also
confirms <u>Abbas and Sağsan (2019)</u> study in which they identified a similar relationship between KM and green innovation. In another study, <u>Yusr et al., (2017)</u> also said that those firms which pay attention to TQM and KM activities tend to innovate more than other companies. Such companies also have a tendency to lead the market and dominate the competitors.

This significant result indicates that firms' commitment to KM triggers their ability to innovate environmental-friendly products and services. Effective KM provides a foundation for employees to share their knowledge and expertise with other workers so that other workers can capitalize on their colleagues' experience and know-how. This collaboration greatly enhances firms' capabilities to innovate and achieve excellence in operations. The analysis of green innovation on CSD indicated 0.322 coefficient value along with 2.912 critical ratio and 0.002 significance values. This significant relation confirms <u>Yu and Huo (2019)</u> and <u>Xie, Huo and Zou (2019)</u> studies in which they said that green innovation has a significant and positive impact on firms financial performance.

7.5 - The Influence of Control Variables

According to <u>Habib</u>, <u>Abbas and Noman (2019)</u>, there are a number of factors which influence the performance of organizations, such as industry category, marketsize, organizational size, age of population etc. The nature of each factor varies according to study type. Considering the nature of variables, the current study incorporates two control variables, namely industry-type and firm-size. The author followed Hoang et al's., (2006) approach and divided firms into medium and large-size firms. As explained earlier, firm-size is taken as a control variable because large firms possess more resources and technical expertise than small or medium firms. Considering Hoang et al., (2006) criteria firms having 50 to 200 employees were categorized into the medium group and those with more than 200 workers were placed into large-size firms.

The author first analysed the direct impact of TQM on CSD keeping 'firm size" as the control variable and found a significant and positive impact. This means that the degree of TQM's impact on CSD varies from medium firms to large-size firms. Taking into this significant result, the author decided to perform dimension level analysis for firm-size. The inclusion of firm-size in the relationship between TQM and CSD dimensions indicated mix results. The firm size indicated an insignificant impact in the relationship between TQM and environmental and economic dimensions of CSD. This means that TQM practices are equally important for all sizes firms to achieve economic and environmental sustainability. However, social sustainability indicated a significant result indicating that the impact of TQM practices varies from large firms to medium firms with respect to their participation in social development programs.

The second control variable of the study is the "industry type". The author divided the target population into two groups, namely "manufacturing" and "services", by considering the differences in their operations. The reason for separating manufacturing firms from services firms is that manufacturing firms perform their operations totally in different manners from services firms. For example, the output of the services sector is instantly utilized by the customers while manufacturing firms output takes time to consume. The inclusion of industry type in the relationship between TQM and CSD indicated an insignificant result that represents the equal importance of TQM in manufacturing and services industries with respect to achieving sustainability objectives.

After the identification of the insignificant role of the industry type, the author analysed this relationship at a dimensional level. Inclusion of industry type in the relationship between TQM and sustainability's dimensions indicated the insignificant impact on social and economic sustainability and significant impact on environmental sustainability. The insignificant results represent the equal importance of TQM for manufacturing and services firms in order to achieve economic and social sustainability. However, a significant result for environmental sustainability means that the importance of TQM varies from manufacturing firms to services firms with respect to achieving environmental sustainability.

7.6 - Implications of the study

The current study provides a number of implications for academician and practitioners. These implications also serve as recommendations to the leadership or

management of firms. The author has divided implications into theoretical, practical and methodological sections.

7.6.1 - Theoretical Implications

The current study analysed the relationship between TQM, KM and CSD. The conceptual framework of the study, which has empirically been tested, has a number of theoretical implications. Firstly, it is one of the pioneer studies to analyse the relationship between TQM and CSD through the mediating impact of KM, with special focus on firms located in Pakistan. Although there are some studies which have partially examined these variables in different contexts, however, as per the researcher's knowledge, the conceptual framework proposed in this study has never been tested before. Therefore, this study empirically confirms the relationship between TQM and CSD through the mediating between TQM and CSD through the mediating has never been tested before.

Secondly, this study makes a contribution to the empirical relationship between TQM, CSD and KM and its findings support TQM advocators' arguments that effective implementation of TQM can benefit the firm in achieving excellence in their operations. However, as to achieve maximum benefits from TQM with respect to CSD, firms must ensure their commitment to KM practices. This study also provides a detailed understanding of the relationship between different variables by conducting dimension level analysis of all constructs. The dimensional analysis enabled the author to compile a comprehensive framework in quality, sustainability and KM framework.

The findings of this study also provide empirical evidence on the relationship between KM and green innovation and how green innovation impacts on CSD. This study provides evidence that KM, similar to TQM is a holistic approach and, to achieve maximum benefits from KM, firms must pay attention to its processes in comprehensive manners. The holistic approach represents the interdependence of KM practices and the importance of each practice for the success of the KM program. This study extends the prospects of KM and explains how KM can enhance the capabilities of firms to achieve green innovation goals. Another implication of the study is that it integrates different theories, such as the theory of KM, the theory of SD and green theory with the MBNQA model. As elaborated in the literature section, the author developed the framework for TQM, KM and CSD and analysed the relationship between them on the basis of these theories. Thus, the findings of this study provide empirical evidence to support the principles of these theories.

7.6.2 - Practical Implications

The findings of the present study also provide a number of practical implications. This study highlights the importance of institutionalizing TQM in the manufacturing and services industries to achieve SD objectives through it. This study will not only create awareness among organizational leaders about the role of TQM in corporate sustainability and KM, but will also encourage them to ensure their commitment with its implementation in a holistic manner. From the practical perspective, it is crucial to implement TQM in a holistic manner as all the dimensions of TQM used in the current study are considered as TQM's core components. Therefore, if organizations want to get maximum benefits from TQM, they must implement and show commitment with these six elements, namely leadership, strategic planning, process management, customer focus, information and analysis and HRM.

In terms of KM, the current study suggests that TQM has great potential to improve firms KM activities that has critical importance in designing business strategies and achieving organizational objectives. By integrating TQM with KM strategies, firms can achieve improvements in their processes. The integration between TQM and KM can also enable firms to find new means of operations and achieving strategic advantage. However, to achieve this objective, the management must concentrate on all practices of KM, namely knowledge creation, knowledge acquisition, knowledge sharing and knowledge application.

Another practical implication of the study is the finding that TQM practices are equally important for manufacturing as well as services industries to achieve corporate sustainability. This finding provides confidence to the services firms that if they implement TQM in a holistic manner, they can get similar benefits as being obtained by manufacturing firms with respect to sustainability. Taking into account different dimensions of sustainability, the current study suggests that to achieve environmental sustainability, manufacturing firms need to pay more attention to their operations as their operations are causing more damage to the natural environment. However, with respect to social and economic sustainability, TQM plays an equal role in manufacturing and services firms.

This study also provides confidence to the managers of medium-sized firms that if they implement TQM in its true spirit and pay attention to its operations, they also can achieve excellence in their operations, similar to large-size firms. However, the significant role of firm-size in the relationship between TQM and CSD means that mostly, large-sized firms tend to follow sustainability practices while medium-sized firms pay inadequate attention to such practices. For this reason, it is suggested that the management of medium-sized firms must take initiatives to ensure sustainability in their operations and integrate their quality and business strategy with sustainability strategy.

The current study proposes that firms must sustain their attention to knowledge creation activities as the empirical results indicate that the sampled organizations are giving adequate attention to knowledge creation activities. It is recommended that firms must take initiatives to identify the gap between available and required knowledge and allocate adequate resources to fill this gap. Firms should also capitalize on technological techniques to further benefit from the latest trends in the market and enhance their knowledge sources.

In connection to knowledge acquisition, the management of firms must focus on obtaining required knowledge from different means, such as customers, suppliers, employees and all other stakeholders. The obtained knowledge must be converted into a valuable form so that it can be used in organizational development processes. In knowledge sharing aspect, firms must promote the culture of sharing and trust among the workers. They should encourage their employees for collaboration, promote and develop their communication skills and provides incentives for knowledge sharing by offering financial and non-financial rewards to workers proposing unique and innovative ideas. Such organizations also ensure their workers' participation in decision-making processes and respect their voice.

In connection to knowledge application, the current study proposes that organizational leadership must capitalize on the latest technology to take benefit from created or acquired knowledge. Learning firms focus on exploiting knowledge through different innovation means using knowledge to solve existing problems and avoid potential issues. In connection to green innovation, this study highlights the important role of KM and states that to achieve green innovation objectives, firms should pay attention to KM activities, particularly knowledge acquisition and knowledge sharing practices.

In general, both, manufacturing and services firms should promote the culture of TQM in their organizations as, according to current study findings, this will enhance organizational capabilities to achieve excellence in KM practices, green innovation performance and finally achieving sustainability objectives. The contributions made by TQM not only directly facilitate firms to achieve sustainability, but also impact on KM which further makes an impact on green innovation leading to enhanced organizational performance.

7.6.3 - Methodological Implications

The current study has a number of methodological implications. The author combined different previously developed and validated instruments in the present study to measure different variables, namely TQM, KM, green innovation and CSD. The author performed a rigorous analysis to further validate the combined instrument. The literature provides a number of studies on TQM and KM. However, most of the studies paid little attention to traditional testing techniques, such as Cronbach's alpha and multivariate statistical technique. By focusing on different validation techniques, discussed in the methodology section, and performing CFA, the present study makes a valuable contribution to the literature of TQM, KM, CSD and green innovation.

In addition to this, rare attention has been given to analyse the causal relationship between studied variables through SEM. Although SEM has become a popular technique in different social sciences researches, inadequate attention has been given to it in management sciences through multivariate statistical analysis. To ensure the true representation of the results, the author adhered to all prerequisite and conditions linked with SEM, such as sample size, multicollinearity and common method bias.

To get a detailed understanding of the variables from different perspectives, the author divided the sampled firms into different groups by considering their demographics, such as medium and large-size firms, manufacturing and services firms etc. This categorization enabled the author to analyse these variables from a demographic perspective and investigate whether demographic differences affect the relationship between the studied variables or not.

7.7 - Detailing the Limitations

Similar to other scientific researches, the current study also has some limitations which are essential to clarify. The Author has categorized the present study's limitations into two categories, namely generalizable and methodological. From the generalizability perspective, it is difficult to generalize the findings of the current study in a broad context, such as in different countries and cultures, since the author collected data from firms located in Pakistan. The author analysed how the sampled firms in Pakistan focus on TQM practices and how this phenomenon (TQM) impacts on studied firms' KM and CSD practices. The target population of the study consists of manufacturing and services firms registered on the Securities and Exchange Commission on Pakistan (SECP) and having ISO 9001 quality certification. For this reason, firms which do not contain quality certification have been ignored in the sampling process.

In term of methodological limitations, the author focused only on the people having management positions. The author divided the respondents into three groups, namely top management, middle management and lower management. The reason for getting responses only from the management persons was that they not only are responsible for designing organizational strategies, but they also have factual knowledge about the operations and execution of strategy. Another limitation of the study is that responses collected through questionnaire are based on respondents' perception and ignores the published reports. The respondents' perception of these variables with respect to their firm performance could have caused bias. Although the author has performed a common method bias test to examine this issue which indicated its non-existence, however, the bias issue cannot be fully ignored.

7.8 - Future Recommendations

To counter the issue of previously mentioned limitations, this research proposed a number of questions which can be investigated by different researchers in future studies. The author followed a cross-sectional approach to collect data between the studied variables by adopting the questionnaire developed in different studies. TQM, KM and CSD are long-term initiatives and their effects take time. For this reason, in the future researches, it is recommended to follow the panel data approach so that the changes made by TQM on KM and CSD over time can be analysed.

The author followed a quantitative approach to analyse the causal relationship between the studied variables. For this purpose, junior, middle and top management persons were contacted. It is recommended to expand the target population and, along with management person, include operational and supervisory staff as their opinion can provide a further understanding of the variables. Moreover, along with empirical techniques, the incorporation of qualitative technique can make the investigation of the relationship between these variables more comprehensive.

For the purpose of the present study, the author collected data for dependent and independent variables from the same person. The feedback by a single respondent on dependent and independent variables could have caused the bias issues. Although, the author has performed CMV bias test to ensure its non-existence, however, it is recommended to collect data for dependent and independent variables from different persons so that the issue of CMV bias can fully be eliminated.

As mentioned in the limitations section, the present research is focused on firms located in Pakistan. The author collected data from medium and large-size manufacturing and services firms located in top five industrial cities of Pakistan, namely Karachi, Lahore, Islamabad, Sialkot and Faisalabad. It is recommended to replicate the same study in a different region so that the issue of regional and cultural differences can be analysed.

7.9 - Conclusion

The introduction of the TQM concept gained a lot of attention from different academicians and practitioners. A number of researchers have analysed TQM from different perspectives. In the current study, the author has examined how TQM, as a management system, impacts on organizational sustainability and how KM mediates the relationship between the two variables. For this purpose, the author followed six TQM practices proposed in MBNQA, namely leadership, strategic, planning, customer focus, process management, HRM and information and analysis. Corporate sustainability has been evaluated through three dimensions, namely economic, social and environmental sustainability. The construct of KM has been analysed through four dimensions, namely knowledge creation, knowledge acquisition, knowledge sharing and knowledge application. The current study focuses on medium and large-size manufacturing and services firms located in five top-ranked business cities in Pakistan, namely Karachi, Lahore, Islamabad, Sialkot and Faisalabad.

The structural analysis of the impact of TQM on CSD indicated significant positive results. Similar results are found for the impact of TQM on CSD's dimensions. The author incorporated KM as the mediating variable in the relationship between TQM and CSD and identified the partial mediation effect with the inclusion of KM in TQM and CSD relationship. The author also analysed the relationship between KM and green innovation and examined how KM impacts on green innovation which has critical importance in SD.

Overall, the current study concludes that TQM, as a management system, has great importance for organizations to achieve sustainability objectives. It also has great strength to enhance the firms' KM activities, which ultimately help the firms to enhance their performance and achieve sustainability objectives. For this purpose, it is strongly recommended that TQM must be implemented in a holistic manner. The current study makes a number of theoretical and practical contribution. The author grounded the framework of the study on the American quality MBNQA model, theory of KM, the theory of SD and green theory. The findings of the study provide empirical support to the theories and literature pertaining to these theories. Moreover, the empirical results add value to the limited literature on TQM, KM and CSD.

From the practical perspective, the present study findings strongly propose that firms should pay strong attention to TQM practices since it has great potential to improve operations as well as financial performance and ensure the achievement of SD objectives. TQM also indicated a significant impact on KM which ultimately impacts CSD. Considering this significant role of TQM, it is suggested that firms must integrate their KM strategies with TQM strategy so that sustainability can be achieved in all aspects of the operation.

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APPENDIX

Questionnaire

Dear sir/madam, I am conducting a research to investigate the impact of total quality management on corporate sustainable development through the mediating impact of knowledge management. Please rate your organization on the following questions from 1 to 5 where 1 represents strongly disagree and 5 represent strongly agree. Your responses will be kept confidential and will be used for the stated purpose, only. Your cooperation is highly appreciated.

Demographic Informati	on:	Gender:	1) Fem	ale	2) Male		3) Prefer n	ot to c	discl	ose
Age:	1) Less thai	n 20		2) 20-3	0		3) 31-40			
	4) 41-50		5) 50+							
Years of Experience:	1) Less thai	n 1-5		2) 6-10		3) 11-1	5		4)	16-
20	5) 2´	1-25		6) 25+						
Position within the organ	ization: 1) Jι	unior Mana	gement	2) Midd	le Mana	gement	3) Тор Ма	nagen	nent	
Organizational status:	1) Governm	ient	2) Priva	ite	3) Semi	-Govern	ment			
Organizational purpose:	1) Profit		2) Non-	Profit (ir	cluding	NGOs)				
Industry:	1) Manufact	turing	2) Serv	ices						

Particulars	SD	DA	Ν	AG	SA
Leadership					
The top management of my company is strongly committed to the culture of	1	2	3	4	5
change					
The top management of my company is dedicated to quality improvement and	1	2	3	4	5
learning					
The top management of my company allocate sufficient resources for	1	2	3	4	5
products and service quality improvement					
The top management strongly encourage the employees to share their views	1	2	3	4	5
and try new things					
The top management regularly share the organization vision with employees	1	2	3	4	5
and ensures the unity among departments to achieve excellence					
Strategic Planning					
My organization has a clear vision and mission statements which are	1	2	3	4	5
supported by all employees					
The top management of my company regularly sets and reviews short and	1	2	3	4	5
long-term goals for managers					
The management provides adequate resources and support to achieve short	1	2	3	4	5
and long-term objectives					
The policies and plans of my company consider employees', customers', and	1	2	3	4	5

other stakeholders' needs

The strategies and plans of my company are focused on quality improvement	1	2	3	4	5
Our office's operations are effectively aligned with mission and vision	1	2	3	4	5
statements					
Customer Focus					
My organization design products and services by considering the customers'	1	2	3	4	5
requirements					
We regularly provide information about our new products and services to our	1	2	3	4	5
customer					
My organization regularly takes feedback from customers about their	1	2	3	4	5
experiences and expectations to measure their satisfaction					
The information about customers' experience and expectations is widely used	1	2	3	4	5
by the management to improve the products and services					
Managers and executives support the employees' initiatives to improve	1	2	3	4	5
customers' satisfaction					
We are keen to resolve customers complaints and have an effective	1	2	3	4	5
mechanism for it					
My organization keeps a strong relationship with customers by providing them	1	2	3	4	5
with an easy channel for communication					
Process Management					
We have standardized operational processes which are clear and well	1	2	3	4	5
understood by employees and customers					
Most of the processes in our organization are automated, fool-proof, and	1	2	3	4	5
minimizes human error chances					
We have the latest technology and equipment to serve our customers more	1	2	3	4	5
effectively and efficiently					
Our system allows us to inspect and track key processes that are critical to	1	2	3	4	5
the organization					
We regularly evaluate and improve our business processes to ensure quality	1	2	3	4	5
Human Resource Management					
The management gives value to recruitment and selection standards and	1	2	3	4	5
employs a right man at the right place					
My organization regularly arranges training and development sessions for its	1	2	3	4	5
employees					
We have effective work recognition and reward system to motivate the	1	2	3	4	5
employees					
The management of my company regularly takes employees' views and	1	2	3	4	5

consider them to improve product and service quality					
We have effective top-to-bottom and bottom-to-top communication process	1	2	3	4	5
Quality is taken as their responsibility by all employees	1	2	3	4	5
My company treats its employees as assets and regularly measure their satisfaction level	1	2	3	4	5
The management of my company is concerned about the well-being of its	1	2	3	4	5
employees (health, medical and security) and provide financial support to them					
Information & Analysis					
We have effective information and reporting system for all products and	1	2	3	4	5
services					
The management regularly provides quality data (errors, complains, defects etc) to the workers	1	2	3	4	5
Workers, supervisors, and managers can easily retrieve information about	1	2	3	4	5
different products and services					
The top management uses quality data to make decisions and plans	1	2	3	4	5
All departments coordinate with each other to implement and monitor quality	1	2	3	4	5
improvement programs					
Knowledge Creation					
My organization uses existing knowledge to create new knowledge	1	2	3	4	5
The management encourage debates and discussions related to business	1	2	3	4	5
issues to create new knowledge					
Employees proposing new ideas, knowledge, and solutions are highly	1	2	3	4	5
appreciated and rewarded by the management					
Different departments work together (like brainstorming) to create new	1	2	3	4	5
knowledge					
We evaluate new ideas on regular bases to further refine it	1	2	3	4	5
Knowledge Acquisition					
My organization regularly takes information about market trends (customers and suppliers) by conducting a market survey	1	2	3	4	5
The management of my company regularly acquire information from	1	2	3	4	5
employees about their needs					
My organization regularly provides training to its employees to acquire new	1	2	3	4	5
knowledge					
We have well-developed information system through which employees can	1	2	3	4	5
acquire required information					
My organization encourage and support the employees to acquire new	1	2	3	4	5

knowledge

Knowledge Sharing					
My organization's workers regularly interact with each other to discuss	1	2	3	4	5
different developments and share knowledge					
We have a well-organized system through which we can share knowledge	1	2	3	4	5
and learn from each other					
We are provided with the latest equipment and technology to obtain and share	1	2	3	4	5
the knowledge					
My organization recognizes and rewards the employees sharing innovative	1	2	3	4	5
ideas and new information					
My organization regularly share latest knowledge and market trends with its	1	2	3	4	5
employees through e-mail, training sessions, and workshops					
We regularly share information and knowledge related to business with our	1	2	3	4	5
customers, suppliers, and other stakeholders					
Knowledge Application					
We regularly apply newly obtained knowledge into practice to solve different	1	2	3	4	5
operational issues					
My organization quickly respond to customers' and suppliers' needs	1	2	3	4	5
My organization uses acquired knowledge to produce new products and	1	2	3	4	5
services					
We use the knowledge obtained from our experiences and mistakes to	1	2	3	4	5
improve our operational and financial performance					
We use the acquired knowledge to develop our strategies	1	2	3	4	5
We have strong commitments for implementing our organizational strategies	1	2	3	4	5
Environmental Sustainability					
Our operational activities are friendly to the natural environment and minimize	1	2	3	4	5
pollution (air and water) and climate change risks					
We have the latest equipment to minimizes the negative impact of our	1	2	3	4	5
operations on the environment					
My organization has strong commitments to the natural environment and	1	2	3	4	5
regularly participates in events to protect and promote it					
We are committed with least utilization of conventional or non-renewable	1	2	3	4	5
energy resources					
My organization is committed to creating a better environment for the future	1	2	3	4	5
generations					
Social Sustainability					
My organization regularly participates in social development programs e.g.	1	2	3	4	5

support to underprivileged and needy ones to im	prove the society					
My organization regularly provide opportunities to	o youngsters e.g. training and	1	2	3	4	5
development to promote their talent						
My organization regularly provides financial a	and non-financial support to	1	2	3	4	5
NGOs, medical institutions, and related organiza	tions for a healthy lifestyle					
My organization provides financial and non-fination	ancial support to educational	1	2	3	4	5
institutions for students learning and developmer	nt					
My organization encourage its employees to part	ticipate in voluntary activities	1	2	3	4	5
Economic Sustainability						
We offer innovative products and services at low	cost	1	2	3	4	5
Our operating cost is less than our competitors		1	2	3	4	5
Our effective operational performance has resul	ted in improved market share	1	2	3	4	5
and profitability						
My organization has experienced a significant inc	crease in overall profit	1	2	3	4	5
Green Technological Innovation						
Our new technology facilitates the developn	nent of environment-friendly	1	2	3	4	5
product						
Out new technology enables the use of clean a	and recyclable material in the	1	2	3	4	5
production process						
Our new technology enables the use of less resc	ources	1	2	3	4	5
Our new technology ensures that our production	n and operation activities are	1	2	3	4	5
environment-friendly						
Green Management Innovation						
The management of my organization is I	highly committed to follow	1	2	3	4	5
environment-friendly policies						
We regularly review and redesign our strategies	to ensure its compliance with	1	2	3	4	5
environmental criteria						
Our organization is open to adopt new or in	nprove existing management	1	2	3	4	5
system with respect to policies and practices						
The management ensures the availability of i	infrastructure to improve the	1	2	3	4	5
operational processes						
Our organization is open to adopt new or in system with respect to policies and practices The management ensures the availability of i operational processes	nprove existing management	1	2	3	4	Ę

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BİLİMSEL ARAŞTIRMALAR ETİK KURULU

23.10.2018

Sayın Jawad Abbas

Bilimsel Araştırmalar Etik Kurulu'na yapmış olduğunuz YDÜ/SB/2018/271 proje numaralı ve **"Examining the role of total quailty management in corporate sustainable development through the mediating effect of knowledge management and green innovation"** başlıklı proje önerisi kurulumuzca değerlendirilmiş olup, etik olarak uygun bulunmuştur. Bu yazı ile birlikte, başvuru formunuzda belirttiğiniz bilgilerin dışına çıkmamak suretiyle araştırmaya başlayabilirsiniz.

Doçent Doktor Direnç Kanol

Bilimsel Araştırmalar Etik Kurulu Raportörü

Direnc Kanel

Not: Eğer bir kuruma resmi bir kabul yazısı sunmak istiyorsanız, Yakın Doğu Üniversitesi Bilimsel Araştırmalar Etik Kurulu'na bu yazı ile başvurup, kurulun başkanının imzasını taşıyan resmi bir yazı temin edebilirsiniz.



BİLİMSEL ARAŞTIRMALAR ETİK KURULU

23.10.2018

Dear Jawad Abbas

Your application titled **"Examining the role of total quaity management in corporate sustainable development through the mediating effect of knowledge management and green innovation"** with the application number YDÜ/SB/2018/271 has been evaluated by the Scientific Research Ethics Committee and granted approval. You can start your research on the condition that you will abide by the information provided in your application form.

Assoc. Prof. Dr. Direnç Kanol

Rapporteur of the Scientific Research Ethics Committee

Direnc Kanol

Note: If you need to provide an official letter to an institution with the signature of the Head of NEU Scientific Research Ethics Committee, please apply to the secretariat of the ethics committee by showing this document.