THE MEDIATING EFFECT OF TOTAL QUALITY MANAGEMENT ON THE RELATIONSHIP BETWEEN MANAGEMENT INFORMATION SYSTEMS AND ORGANIZATIONAL PERFORMANCE

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UNIVERSITI PENDIDIKAN SULTAN IDRIS
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Dedicated to my beloved family to the most precious persons in my life, my parents, my wife, my darling sons(Mohammed and Hasan), my sisters and my brother.

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My praise is fully directed to Allah for enlightening me and giving me the knowledge and strength to complete this research.

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ABSTRACT

Management Information Systems (MIS) play a vital role in the success and performance of organizations. Information is essential for organizations to develop. Although extensive literature is available on the effectiveness of MIS to enhance organizational performance, it is unclear which MIS indicators can be linked with organizational performance. Thus, to fill this gap, this study investigated the effect of MIS indicators on organizational performance in Missan Oil Company in Iraq. In addition, the study identified the mediating role of Total Quality Management (TQM) between MIS indicators and organizational performance. A quantitative approach using Structural Equation Modeling (SEM) as a research design. A study sample of 250 managers (low, middle and high level) using simple random sampling was related. After screening the initial data, 201 questionnaires were utilized for the final data analysis. SEM was used to analyze the data. Findings revealed that MIS indicators, namely net benefits ($\beta = 0.20$, $p > 0.05$), information quality ($\beta = 0.13$, $p > 0.05$), and user satisfaction ($\beta = 0.13$, $p > 0.05$) had positive effects on organizational performance. Meanwhile, TQM fully mediated the relationship among system quality (p.bootstrap = 0.013), information quality (p.bootstrap = 0.001), use of system (p.bootstrap = 0.001), and organizational performance. Furthermore, TQM partially mediated the relationship among user satisfaction (p.bootstrap = 0.001), net benefits (p.bootstrap = 0.001), and organizational performance. In conclusion, MIS indicators play an important role in increasing organizational performance, and TQM serves as an influential mediator in the relationship between MIS indicators and organizational performance. Clearly, these findings have the potential to guide the Iraqi oil sector to focus on the appropriate MIS indicators that enhance its organizational performance.

KESAN MODERATOR PENGURUSAN KUALITI MENYELURUH TERHADAP HUBUNGAN ANTARA SISTEM PENGURUSAN MAKLUMAT DAN PRESTASI ORGANISASI

ABSTRAK

Sistem Pengurusan Maklumat (MIS) memainkan peranan penting kepada kejayaan dan prestasi organisasi. Maklumat menjadi elemen penting kepada pembangunan organisasi. Walaupun kajian literatur terhadap keberkesanan MIS bagi meningkatkan prestasi organisasi tersedia dengan banyaknya, tetapi masih tidak jelas indikator-indikator MIS yang dapat dikaitkan dengan prestasi organisasi. Oleh itu, bagi mengisi jurang itu, kajian ini mengkaji hubungan antara indikator Sistem MIS dan prestasi Syarikat Minyak Missan di Iraq. Di samping itu, kajian ini cuba untuk mengenal pasti peranan mediator Pengurusan Kualiti Menyeluruh (TQM) antara indikator MIS dan prestasi organisasi. Kajian ini menggunakan pendekatan kuantitatif Pemodelan Persamaan Struktur (SEM) sebagai reka bentuk penyelidikan. Sampel kajian 250 pengurus (peringkat bawahan, pertengahan, dan tinggi) yang dipilih melalui pensampelan rawak mudah. Selepas melalui proses penapisan, 201 soal selidik dipilih untuk analisis data. SEM digunakan untuk menganalisis data. Dapatan menunjukkan indikator MIS, iaitu manfaat bersih ($\beta = 0.20$, $p > 0.05$), kualiti maklumat ($\beta = 0.13$, $p > 0.05$), dan kepuasan pengguna ($\beta = 0.13$, $p > 0.05$) mempunyai kesan positif terhadap prestasi organisasi. Sementara itu, TQM mempunyai kesan mediasi sepenuhnya terhadap hubungan antara kualiti system ($p.bootstrap = 0.001$), kualiti maklumat ($p.bootstrap = 0.001$), kepuasan pengguna ($p.bootstrap = 0.001$), dan prestasi organisasi. Tambahan pula, TQM mempunyai kesan mediasi separa terhadap hubungan antara penggunaan sistem ($p.bootstrap = 0.001$), manfaat bersih ($p.bootstrap = 0.001$), dan prestasi organisasi. Sebagai rumusan, indikator MIS memainkan peranan penting dalam meningkatkan prestasi organisasi, dan TQM berfungsi sebagai mediator yang berpengaruh dalam hubungan antara indikator MIS dan prestasi organisasi. Jelas sekali, dapatan ini mempunyai potensi untuk membimbing sektor minyak Iraq untuk memberi tumpuan kepada indikator MIS yang sesuai yang meningkatkan prestasi organisasinya.

LIST OF CONTENTS

CHAPTER 1 INTRODUCTION

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BSC	Balanced Scorecard
CFA	Confirmatory Factor Analysis
DOI	Diffusion of Innovation Theory
DSS	Decision-Support Systems
GDP	Gross Domestic Product
ISO	International Organization for Standardization
IT	Information Technology
MIS	Management Information Systems
RBV	Resource-Based View
ROA	Return on Assets
ROE	Return on Equity
ROI	Return on Investments
SEM	Structural Equation Modeling
TAM	Technology Acceptance Model
TQM	Total Quality Management
UPSI	Universiti Pendidikan Sultan Idris

LIST OF APPENDICES

(A) Cover Letter for Survey Questionnaire

(B) Survey Questionnaire

(C) Assumption of Normality

CHAPTER 1

INTRODUCTION

1.1 Introduction

Modern time management relies heavily on information to thrive. Nothing changes without information. In general, it is believed that information is powerful and that its owner has power (Gonfa, 2013). Ironically, many organizations currently suffer from an excess of information. They need to manage such large amounts of information they to confront the information overload the digital era has heralded with its rapid technological advances and widespread knowledge dissemination (Dias, 2001). In this context, the need for information systems arises (Franco & Garcia, 2017). Organizations are investing heavily in information systems because they seek to remain competitive in the market (Thomas, 2008).

Apart from the accelerated pace of technological developments in the field of production, there has also been an evolution in the means of communication and the transmission of information. The growing number of competitive organizations is forcing companies to take quick and effective decisions, which is both a requirement and product of effective organizational performance (Belkur, Mehta, Shafter, & Amar, 2017). Therefore, organizations require tools to aid them to make quick and effective decisions and find ways to reduce uncertainty. Only an effective Management Information System (MIS) can mitigate these challenges (Obara, 2013).

A review of the literature related to MIS and Total Quality Management (TQM) and organizational performance highlights how, a company's prosperity depends on its capability to improve decisions by enhancing the quality of information processing in MIS by adopting TQM and improving organizational performance. To support this hypothesis, this study aims to clarify the effect of the TQM meditation on the relationship between MIS and organizational performance at the Missan Oil Company in Iraq.

1.2 Background of The Study

Contemporary life is characterized by accelerated levels of technological invention and innovation in all fields of life. Such developments include significant advancement in Information Technology (IT). This has resulted in the need for business administrators and organizations manage the rapid technological advancement to ensure that they are operating at the highest level of productivity.

This is vital to ensure competitive advantage in highly competitive markets. One such modern management tool in global organizations is TQM. TQM first appeared in Japan and has been enabled companies to penetrate Western markets through excellence and superiority in performance, reliability and efficiency, and competitive pricing (Almashaqba, 2013).

The IT revolution has dramatically changed the nature of a business and created competitive advantages for those who appreciate its impacts (Ismail, Abdullah, & Tayib, 2003). Although the key function of information is to avoid uncertainty, uncertain circumstances tend to create a solid basis for qualitative decision-making in leadership and administration (Shaqiri, 2014). MIS is a computer-based information systems designed to meet the overall information needs of administrators across the breadth of its operations (Asemi, Asefeh, & Ali Safari, 2011). MIS manages, organizes and retrieves information that assists the company to provide faster services, and market products with more accuracy and ease, thereby improving the performance level (AL-Gharaibeh & Malkawi, 2013).

MIS is a systematic, automated, and varied information system that collects, stores, processes, and distributes data associated with various parts of an enterprise. This data is processed in different forms, such as graphs, diagrams, charts, and reports to create accurate, pertinent and valuable information for the administration. This information is shared with different units to be utilised for decision-making and effective management (Ranisavljević, Spasić, & Mladenović-Ranisavljević, 2012).

The large number of MIS utilised in contemporary business can implement various functions that can perform all business operations simultaneously. In decision-making, the ability to perform multiple tasks ensures that decisions are made quickly when compared to those systems that cannot handle more than one task at a time (Balan & Dhanapandian, 2012).

MIS is distinct from other information systems in that are used to analyse and facilitate strategic and operational activities. Academically, the term is commonly used to refer to the study of how individuals, groups, and organizations evaluate, design, implement, manage, and utilize systems to generate information to improve efficiency and effectiveness of decision-making, including systems termed decision support systems, expert systems, and executive information systems (Deoda, 2015).

In order to ensure its viability and growth, an organization seeks to exploit MIS as it aims to produce information that guides management to meet these challenges. The most important of these challenges is the need for organizations to implement the TQM system with all its requirements and stages. This system has the advantage of ensuring the survival of organizations in a highly competitive business world (Zbar, 2009).

In addition, TQM is an administrative approach that supports organizations to increase their performance and effectiveness as a whole, making it easier for TQM organizations to compete globally (Boon, 2013). In the present competitive environment, TQM has become vastly known as a vital engine for both industrial and service organizations to survive and succeed (Claver-Cortés, Pereira-Moliner, Tarí, &

Molina-Azorín, 2008). Empirical studies have shown that when TQM is performed in an enterprise effectively, it will improve the performance of the organization (Anderson & Sohal, 1999). The above view also underlines the principles of TQM as a means to improve an organization's performance in order to achieve benefits like enhancing customer satisfaction, improving the quality of goods and services, productivity and profits, waste minimisation and cost among other advantages (Ciptono, 2011).

Realistically, TQM and information systems (including MIS) have common goals. Some of the main goals of TQM are to develop product and process quality to meet the needs of the organization's members and consumers and to increase competitiveness and effectiveness. Whereas the objectives of information systems are to increase production, improve quality, improve services, lower costs, increase the competitiveness of companies (Khalil, 1994). On this basis, the researcher believes that TQM assists in increasing the ability and skill to use MIS which supports improved performance in an organization.

MIS, TQM, and organisational performance are the variables addressed in the current study. However, the researcher found that limited literature is available for studying these variables in the context of the Iraqi oil industry. Moreover, the researcher believes that dealing with these variables will be important for the Iraqi oil sector, given the significant risks associated with the processes of the Iraqi oil industry. Manager's monitor and evaluate the trends in their business environment through available internal and external channels of information which are made accessible to them using modern IT (Gonfa, 2013). Also, macroeconomic problems

such as the cost of the war on terror, inflation rates, exchange rates, unemployment rates, debt, debt service rates, export and import growth rates, political instability, lack of reliance on MIS in decision making, and poor TQM implementation adversely affect the performance of the companies operating in Iraq's oil industry (Saddam, 2017).

Depending on the above, the current study discusses the impact of MIS on organizational performance in the context of TQM within the organization. The impact of MIS on organizational performance in the context of TQM was assessed by collecting data using a questionnaire distributed to managers of the Missan Oil Company in Iraq.

1.3 Problem Statement

One of the most important roles of managers is to make decisions to solve current problems and achieve progress across the entirety of the firm (Mirahmadi, Rashidi, Kianian, & PoorAlian, 2014). In modern organizations, administrative decision-making has become extremely complicated. Therefore, administrators require accurate and timely information to make effective decisions (Nedelko, 2009). Baum and Wally (2003) and Goll and Rasheed (1997) stated that organizational leaders are expected to make strategic decisions that have an important effect on their companies. The pattern and speed of decision-making are strongly linked to organizational performance. Therefore, information has become an essential resource for managing modern organizations. This is so because today's business environment is volatile,

dynamic, turbulent and necessitates the burgeoning demand for accurate, relevant, complete, timely and economical information needed to drive the decision-making process in order to accentuate organizational abilities to manage opportunities and mitigate threats (Şükrü, 2015).

In management literature, there is an increasing awareness of the importance of information as a cornerstone of the strategic planning process that provides the basis for effective decision-making (Yap, Platonova, & Musa, 2006). Accordingly, information systems play a main function in the decision-making process (Siejka, 2017).

As lack of information had resulted in the management system lacking an accurate and complete picture of operations, and being unable to recognise the complete strengths and weaknesses of the past and present. As a result, it is not able to properly target and design suitable activities for a management system. This will result in the inefficient use of resources (Faraji & Najafzadeh, 2016). Prior to the development of modern information systems, traditional decision-making processes had been undertaken in the form of accidental management technique. Such an approach to decision-making was randomly and failed to identify the organization's problems accurately. This trial and error approach often resulted in poor performance and bankruptcy (Gonfa, 2013).

MIS represents a subset of total planning and control activities that cover human implementation, techniques and company procedures. Information systems are a mechanism to guarantee that information is available to the administrators in the

desired form and time (Satyanarayana, Srinivasu, Rikkula, & Rao, 2009). Therefore, MIS supports effective decision-making and supports other management processes such as plan development, policy-making, supervision, and performance appraisal, to name a few. The use of such information in performance assessment is more effective when the performance is seen as an administrative process. For example, sensitive subjects need to be considered when planning the development of any organization. Subsequently, managers at all levels of the organization's hierarchy need appropriate data and information to make decisions that enhance organizational performance (Asemi et al., 2011).

Firms are advised to ensure that they recruit the correct person to oversee the control systems because MIS is a very complicated and precise operation requiring careful attention. For this reason, the more careful and professional the assigned person, the more positive the person will be in MIS concerning decision-making and other relevant areas of work (Deoda, 2015). Also, information systems relate to the critical functioning of modern enterprises, institutes and companies. Enterprises use information system technology to gain a competitive advantage over their competitors. Many basic business processes are undertaken to raise production and productivity through the utilisation of information systems (Shaqiri, 2014).

Organizations in developed and developing economies need to transform their traditional bureaucratic management style into a highly value-effective, proactive and proactive approach. For this transformation, the adoption of effective quality strategies and practices is one of the key factors of success (Ahmad & Elhuni, 2014). Performance improvement requires improved quality, hence the need to implement

TQM. Where, TQM is often considered a vital precedent of an organization's performance (Mahmood, Qadeer, & Ahmad, 2015). TQM is an ideology described in management as the philosophy of general administration to assist the company in expecting high-quality in all its operations and processes (Ehigie & McAndrew, 2005). Ciptono (2011) proved that TQM has a positive effect on improving oil companies' performance. As well as the effect of the implementation of TQM on organizational performance, TQM plays a positive mediation role in improving its performance (Demirbag, Koh, Tatoglu, & Zaim, 2006). The adoption of TQM by organizations has contributed to the formulation of organization culture to achieve long and short-term goals. Achieving the desired objectives of organizations requires the establishment, development and strengthening of organizational culture and ensuring the participation of all its members (Al-Dhaafri, Al-Swidi, & Yusoff, 2016).

1.3.1 Identification of The Study Problem

According to Sekaran (2003), the research problem is any situation where a gap exists between the actual and desired state. Figure 1.1 shows how the study problem was defined.
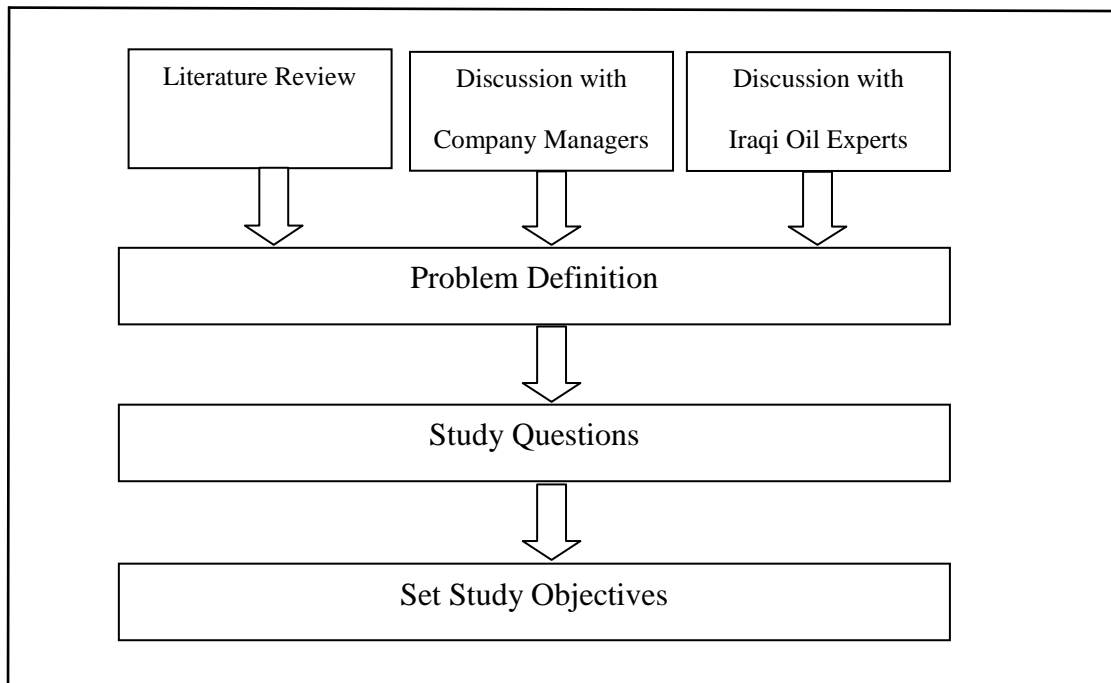
Figure 1.1. Definition of The Study Problem.

Based on the above, and through reviewing the literature on MIS, TQM, and organizational performance, the researcher believes that the development and utilisation of MIS is a recent phenomenon that is related to information that can be accessed. Therefore, the researcher believes that the efficiency of MIS can be increased when the organization implements TQM which will lead to continuous improvement in the planning and decision-making process, thus achieving better organizational performance in developing countries such as Iraq. The ways in which the Iraqi oil companies operate, and the management approach adopted, have proven ineffective. This is because of the management philosophy and approach influence the organization's performance. In reply to the challenges that Iraqi companies are facing, Drucker (2001) and Juran (1995) emphasised that TQM could offer a competitive advantage in today's work environment.

Notably, the Iraqi oil sector is the most significant contributor to Iraq's gross domestic product (GDP). It contributed 99% of total exports, over 90% of government revenues and 60% of GDP (Oil and Gas Factsheet, 2011). Also, Iraq has an enormous wealth of crude oil and natural gas as it has now the fifth-largest oil reserves internationally. Iraq has an estimated potential of 500 billion barrels (Moussa, 2010). In addition, Iraq is managing the oil revenue through a central budget, which is designed to grow and redistribute oil profits to the people. Temporarily, the exports and the production of oil suffer from numerous disruptions (Saddam, 2017). Medium to long-term export profits from oil can increase dramatically only if the production of oil recovers strongly. The economic performance of its oil exports is lower than in other countries in the region. This is frequently elucidated through the impact of wealth of oil over authority and via the risky real effects of exchange rate resting on the non-oil sectors (Mahdi, 2013).

Surprisingly, the impact the oil sector in the Iraqi economy has yet to be studied in detail. Research and exploration are modest, and the levels of production are well-below the country's export potential (Dawood, 2016). Advancing economic efficiency could provide a high-level of luxury, but the wealth has not been exploited according to this standard. Since the discovery and extraction of oil at the beginning of the last century, foreign oil companies took advantage of that wealth until the 1970s, after which it was controlled by the state which drained this wealth on spending on war since the early eighties (Moussa, 2010).

According to Ramlakhan and Chawathe (1993), advanced technology supports the profitability of oil companies. Therefore, Ramlakhan and Chawathe (1993),

suggested that the TQM approach is a means to achieve this advantage and improve the organization's performance through more effective management of technology.

The researcher believes that the Iraqi national oil companies face numerous challenges since the signing of oil licensing with foreign companies since mid-2009 (Dawood, 2016). The main problem is that the Iraqi national oil companies because of the multiple wars and the long years of economic sanctions have no qualifications or human capabilities to keep pace with the global companies that came to work in Iraq, which requires Iraqi companies to improve their performance. Therefore, the researcher believes that in order for the Missan Oil Company to operate on par with international companies, it needs to adopt the philosophy of TQM and MIS, thereby improving the decision-making process and, in turn, improving organizational performance.

According to Zbar (2009), the challenges faced by modern management is the rise of competition which necessitates the use of TQM systems to obtain the certificate of standards set by international organizations, the most important of which is the International Organization for Standardization (ISO).

Hence, according to Zbar (2009), Iraqi organisations are challenged by:

1. The need for quality information produced according to relatively high-quality standards to contribute to the planning and implementation of TQM programmes. This is provided by the MIS, which must conform to the standards of ISO.

2. The problem of not implementing TQM in the organization leads to the failure of MIS to benefit from high-quality information standards.

3. Each system (kernel) is in isolation from each other which leads to the weak performance of the organization.

Based on the above, the researcher believes that, despite the interest of Iraqi oil companies needing MIS, there is a lack of clarity in the interest in these companies to recognise the importance of relying extensively on those systems in rationalising the decision-making process to improve organizational performance. Also, bad management decisions by managers in the company business and entrepreneurial skills can be due to untimeliness and the importance of appropriateness, accuracy and reliable information. Overall, failure to achieve visualizes logical and reasonable prospects for the future is one of the major causes for inefficiency and failure of the management system in the oil industries in Iraq, especially at the Missan Oil Company.

1.3.2 Research Gaps

In view of the importance of MIS, there are many studies on TQM relating to the performance of organizations. Also, many studies addressed the relationship between MIS and the performance of organizations (Al-Mamary, Shamsuddin, & Aziati, 2014a). In addition, numerous studies combined MIS and TQM (Almashaqba, 2013) with other studies that dealt with the relationship between TQM and organizational performance (Ajay & Dhall, 2016).

Limited studies have addressed one or two of these variables in Iraq in general and Missan governorate in particular (Ibrahim, 2008). Furthermore, no study that has combined MIS, TQM and organizational performance together (within the limits of the researcher's knowledge). On the other hand, there are few studies that have been applied to the oil sector in general and in the Iraqi oil sector in particular (Saddam, 2017). Based on Iraqi academic scientific journals (the database of the Ministry of Higher Education & Scientific Research of Iraq), only six studies were carried out by Iraqi oil companies. Three of these studies were on performance and three others were about information systems and IT (Iraqi academic scientific journals, 2017). These three aspects represent a knowledge gap which this study attempts to fill.

On that basis, the present study is an extension of previous studies (Agu, Ugwu, & Igwegbe, 2017; Mehralian et al., 2017; Shafiq, Lasrado, & Hafeez, 2017; Khresat, 2015; Siam, Alkhateeb, & Al-Waqqad, 2012; Dewhurst et al., 2003) which adopted an informational framework in its theoretical approach and methodology. It also constitutes a new addition which deals with the effect of MIS on organizational performance in the context of TQM in the Iraqi oil environment.

This study aims to serve the Iraqi oil industry address the gap in the literature and selecting Missan Oil Company as the sample of the study. Studying this company is significant given that it is the second-largest oil company in Iraq (Official website of the Iraqi Ministry of Oil, 2018).

In addition, the Missan Oil Company is specialised in oil exploration and production. According to Cevenini (1993), the exploration and production of oil is the

basis of any oil corporation. The study clarifies the impact on the use of MIS on the organizational performance in the context of TQM within the company is using Structural Equation Modeling (SEM), a multivariate statistical technique, as a statistical tool to examine the relationship between variables.

1.4 Objectives of The Study

This study investigates the relationship of MIS and organizational performance along with the mediating role of TQM between MIS and organizational performance. The study seeks to achieve the following objectives:

1. To examine the effect of MIS indicators on organizational performance and identify the most effective MIS indicators in organizational performance at the Missan Oil Company.

2. To examine the effect of MIS indicators on TQM at the Missan Oil Company.

3. To examine the effect of TQM on organizational performance at the Missan Oil Company.

4. To examine the mediating role of TQM in the relationship between MIS indicators and organizational performance at the Missan Oil Company.

1.5 Research Questions

The following research questions have been formulated to guide the study to its logical conclusion:

1. Do MIS indicators affect organizational performance and which of the MIS indicators dominantly affect organizational performance at the Missan Oil Company?

2. Is there any effect of MIS indicators on TQM at the Missan Oil Company?

3. Is there any effect of TQM on organizational performance at the Missan Oil Company?

4. Does TQM mediate the relationship between the MIS indicators and organizational performance at the Missan Oil Company?

1.6 The Framework of The Study

The systematic treatment of the study problem in light of the theoretical framework and its practical implications require the design of a default scheme represented by Figure 1.2. This refers to the logical relationship between the variables of the study. In preparing the plan, the study focused on the following points:

1. The possibility of measuring each variable of the study.

2. Inclusiveness of the plan and the possibility of testing.

3. The consistency of variables with the Iraqi environment, particularly in regards to the Missan Oil Company.

In this present construct, the MIS indicators were adopted in the current study as an independent variable that plays a major role in the mediating variable TQM which affects the organizational performance as a dependent variable. The outline of the study is illustrated in Figure 1.2.
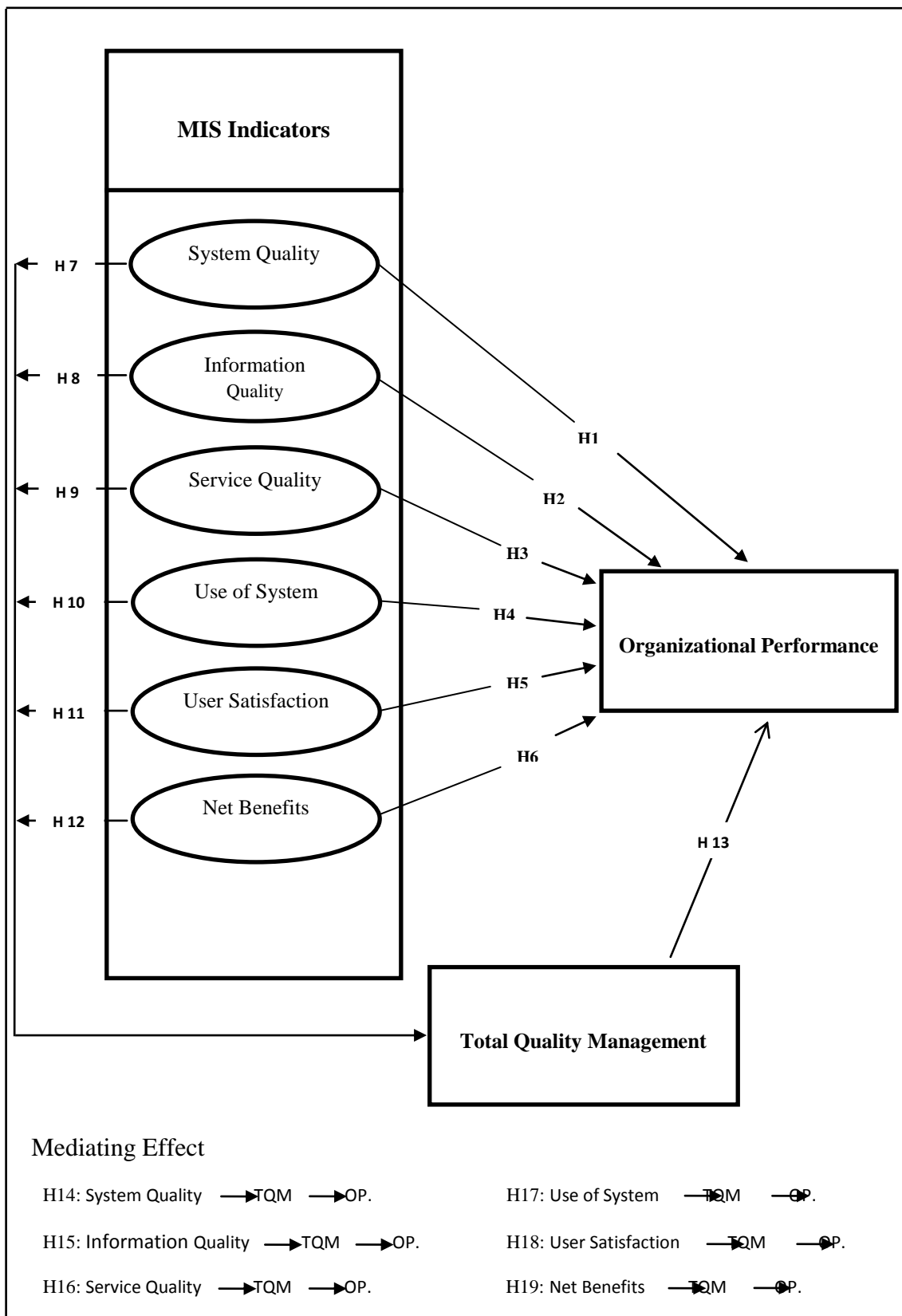
Figure 1.2. Framework of The Study.

1.7 Research Hypotheses

The following hypotheses emerge from the study plan:

H1.System quality is positively related to organizational performance at the Missan Oil Company.

H2.Information quality is positively related to organizational performance at the Missan Oil Company.

H3.Service quality is positively related to organizational performance at the Missan Oil Company.

H4.Use of MIS is positively related to organizational performance at the Missan Oil Company.

H5.User satisfaction is positively related to organizational performance at the Missan Oil Company.

H6.Net benefits are positively related to organizational performance at the Missan Oil Company.

H7.System quality is positively related to TQM at the Missan Oil Company.

H8.Information quality is positively related to TQM at the Missan Oil Company.

H9.Service quality is positively related to TQM at the Missan Oil Company.

H10.Use of MIS is positively related to TQM at the Missan Oil Company.

H11. User satisfaction is positively related to TQM at the Missan Oil Company.

H12.Net benefits are positively related to TQM at the Missan Oil Company.

H13.TQM is positively related to organizational performance at the Missan Oil Company.

H14.TQM mediates the relationship between system quality and organizational performance at the Missan Oil Company.

H15.TQM mediates the relationship between information quality and organizational performance at the Missan Oil Company.

H16.TQM mediates the relationship between service quality and organizational performance at the Missan Oil Company.

H17.TQM mediates the relationship between use the system MIS and organizational performance at the Missan Oil Company.

H18.TQM mediates the relationship between user satisfaction and organizational performance at the Missan Oil Company.

H19.TQM mediates the relationship between net benefits and organizational performance at the Missan Oil Company.

1.8 Scope of The Study

For many years, the influence of MIS on TQM and organizational performance has been studied in various sectors, including the oil sector. MIS has an extensive and considerable impact on the performance and outcomes of an organization (Oil and Gas Factsheet, 2011) .

However, the literature relating to MIS, especially in the context of developing countries, did not include the oil sector. Also, there is a paucity in studies on MIS, TQM, and organizational performance in the oil sector in Iraq. Therefore, this study explores the relationship between MIS, TQM, and organizational performance at the Missan Oil Company that operates in the south of Iraq. Furthermore, to view the concerned MIS and organizational performance, TQM is regarded as a mediating

variable. The oil industry is selected given that it has not been sufficiently explored by research, especially in relation to MIS-performance nexus. Secondly, in Iraq, the oil sector contributes more than 90% to the national exchequer (Oil and Gas Factsheet, 2011).

1.9 Importance of The Research

This study is significant from both theoretical and practical perspectives. The present study would be beneficial for academics as it develops a framework that incorporates MIS indicators, TQM practices, and organizational performance. This would provide an avenue for further researchers. Practitioners involved in MIS for oil companies, as well as the management of the oil companies in Iraq, would benefit from this study as it would provide them with empirical evidence regarding the role MIS plays in organizational performance, making it more of a strategic tool rather than technical function. In addition, the importance of this study stems from its objectives and expected results. It is set to enhance the company's performance by implementing TQM to improve MIS at the Missan Oil Company.

Practically, this study is significant for practitioners, company managers, and government policy makers. The results could guide policy-makers to formulate standardized policies related to application and adoption of MIS by oil companies in Iraq which could help them grow and become more effective. Another contribution of the study is to investigate the mediating role of TQM between the relationship of MIS

and organizational performance. The findings of this study will help decision-makers understand the role of TQM in enhancing organizational performance.

1.10 Conceptual and Operational Definitions

This section explains the key concepts that are frequently used in this study for answering the study questions. A complete explanation is presented in the next chapter.

Management Information System

Conceptual Definition: MIS is a set of interrelated components which collects, retrieves, processes, stores and distributes information to support decision making of managers in an organization (Gupta, 2011).

Operational Definitions: In this study, MIS is the system that combines technology and management and consists of six main indicators, namely system quality, information quality, service quality, use the system, user satisfaction, and net benefits, in order to process data and transform it into meaningful information to help improve the decision-making process then improve the organizational performance.

Total Quality Management

Conceptual Definition: TQM is a holistic management philosophy which aims for continuous improvement in all functions of an organization to produce and deliver commodities or services in line with customers' needs or requirements by

offering better, cheaper, faster, safer, easier processing services under the leadership of top management (Demirbag, Tatoglu, Tekinkus, & Zaim, 2006).

Operational Definitions: In this study, TQM is a managerial philosophy based on the participation of all employees in the organization to improve the quality that includes six dimensions, namely leadership, strategic planning, customer focus, information & analysis, human resource and process management.

Organizational Performance

Conceptual Definition: Organizational performance refers to the phenomena of how well enterprises obtain their desired goals (Khalil, Khalil, & Khan, 2019).

Operational Definitions: In this study, organizational performance can be defined as the effort of the organization to achieve its objectives. This includes four major perspectives, namely financial, customer, internal process, and learning & growth.

1.11 Organization of The Thesis

This thesis was organized into five chapters. Chapter One presents the background of the study, statement of the problem, study questions, objectives of the study, significance of the study, the study scope, conceptual and operational definitions, and the summary. Chapter Two was devoted to the literature review. The aim of this chapter is to acquaint the reader with existing studies relative to the issues covered in

the study. Thus, it provides the theoretical inference for the study and partly establishes the need and relevance for it. This includes pioneering writings on concepts, and the types, practice, areas and applications of MIS, TQM, and organizational performance. Chapter Three examines the research method used in undertaking the studies. Chapter Four dealt with a detailed analysis of the findings, presentation, and interpretation of data. Chapter Five incorporates the summary of major findings, conclusions, and recommendations.

1.12 Summary

The first chapter provided an overview of the research beginning with the concept and the background of the study. The study background identified the challenges and risks faced by Iraqi oil companies and their need to adopt MIS in order to improve their organizational performance. The Iraqi Ministry of Oil should develop a unified policy for IT and orientation towards the knowledge economy by expanding the reliance before the development of modern information systems.

Based on the above, the researcher believes that MIS contributes to organizational performance at the Missan Oil Company. Thus, the researcher listed MIS and TQM as predictors that lead to organizational performance. Furthermore, the first chapter presented the statement of the problem, objectives of the study, significance of the study, scope and limitation of the study and definition of terms that consist of conceptual and operational definitions. Chapter Two reviews the relevant literature on the variables used in the current study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The current chapter presents a review of the literature on MIS, TQM and organizational performance. The first section provides an overview of the Missan Oil Company, followed by the discussion on MIS and organizational performance. This is followed by a discussion of the mediating variable TQM along with the linkages between MIS, TQM, and organizational performance. The theoretical foundations that underlie the model are discussed later in the chapter. A detailed flow of the chapter is presented in Figure 2.1.

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┌─────────────────────────────────────────────────────────────────────┐
│  ┌──────────────┐      ┌──────────────┐      ┌──────────────┐        │
│  │  Missan Oil  │ ──▶  │     MIS      │ ──▶  │     TQM      │        │
│  │   Company    │      │              │      │              │        │
│  └──────────────┘      └──────────────┘      └──────────────┘        │
│                                                      │                │
│                                                      ▼                │
│  ┌──────────────┐   ┌─────────────────────┐   ┌──────────────┐       │
│  │ Theoretical  │◀─ │ Relationship Between │◀─ │Organizational│      │
│  │  Framework   │   │ MIS, TQM, and        │   │ Performance  │      │
│  │              │   │ Organizational       │   │              │      │
│  │              │   │ Performance          │   │              │      │
│  └──────────────┘   └─────────────────────┘   └──────────────┘       │
└─────────────────────────────────────────────────────────────────────┘
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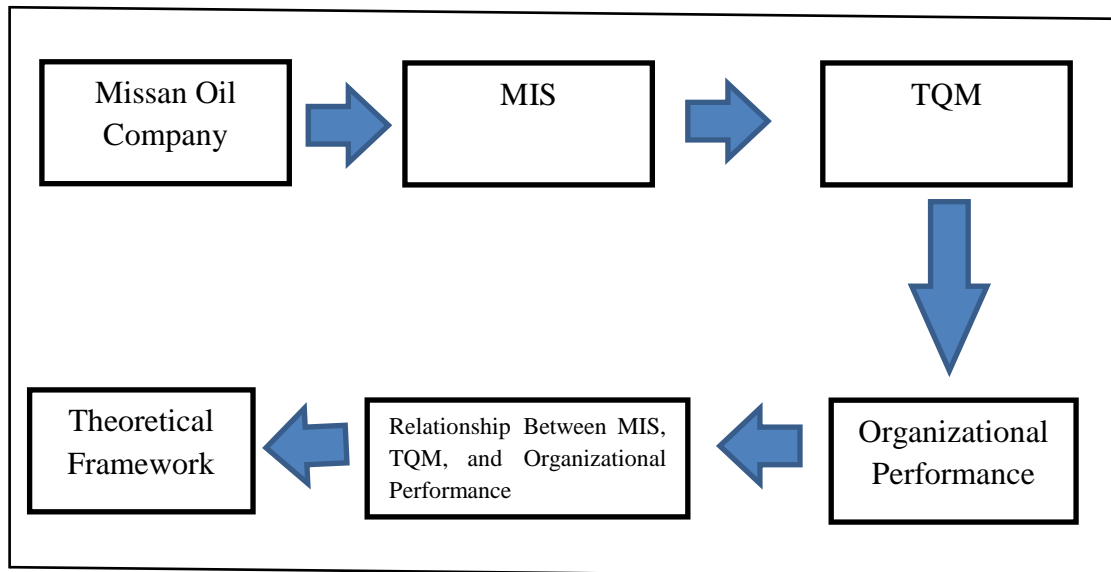
Figure 2.1. Structure of Chapter.

2.2 Overview of The Missan Oil Company

The oil industry is leading source of revenue and contributes significantly to economic performance (Blanchard, 2009). Oil exports help a country earn significant amounts of foreign exchange, which, in turn, helps build its infrastructure. Similarly, the oil sector is considered one of the most important sectors of the economy in Iraq. It contributes 95% to government revenues and 60% to GDP, and it offers tremendous employment opportunities for Iraqis (Al-Nusairi.S, 2016).

Through its 80 known oil fields, Iraq is estimated to have almost 10% of the world proven reserves (143 billion barrels) and 2% of the world natural gas reserves. In Baghdad-administered Iraq, the industry is completely state-owned, with the oil marketing company SOMO selling crude to 40 accredited international companies on

behalf of four producing companies, South Oil Company, North Oil Company, Missan Oil Company and Midland Oil Company. Over 4.38 million barrels per day were produced in 2016 (including production in Iraqi Kurdistan). The 11 international Technical Service Contracts that have been signed hold the promise of total production of over 13 million barrels per day. If this figure were ever achieved, Iraq would become the largest oil producer in the world. The current goal of the Ministry of Oil is to reach a production capacity of 6.5 million barrel per day by 2022 (Extractive Industries Transparency Initiative, 2019).

The Iraqi oil sector includes 15 state oil companies (upstream, midstream and downstream), extractive industry, manufacturing and industrial services (Saddam, 2017). The Missan Oil Company is one of the companies of the Iraqi Ministry of Oil which is concerned with the development and implementation of plans and the studies of oil operations ranging from extraction, processing, transportation, storage and disposal of crude oil. This is carried out in coordination with the ministry departments concerned, through drilling wells and development of oil fields under the Missan province national and investment efforts (Official website of The Missan Oil Company, 2018). However, in 2008, it was separated from the Southern Oil Company to expand oil activities in the province of Missan and the establishment of joint ventures with international companies to develop oil fields (Ibrahim, 2008).

The headquarters of the company is located in the capital of The Missan province, Amara city, which is approximately 360 km from Baghdad and is responsible for fields in the Missan province covering six producing fields (Bazergan, Abu-Gharb, Fakka, Halfaya, Noor and Amara). In addition to the field of Majnoon,

which it operates in partnership with the Southern Oil Company, Missan also holds five discovered fields which are not producing fields, including the Huweiza, al-Rafi'e, East Rafidan, Dujeila and Kumait fields (Iraq Oil & Gas News, 2011).

The company has been operating since 2008 until an agreement was signed within the framework of the Ministry of Labour in 2009, to develop four oil fields for the drilling of wells for producing, and building treatment centers. Currently, more than 350 000 barrels are produced per day. Recently, three oil fields belonging to the company were included in the first round of licenses (Bazarkan, Fakkah and Abu-Gharb) which are granted to Cnooc and the Turkish company, Tabuk, in order to increase the production of the three Missan fields to 450 000 barrels per day in early 2017 (Official website of the Iraqi Ministry of Oil, 2018). Whereas, Iraq produced an estimated 4.659 million barrels of oil a day in August 2017 according to an analysis of the Iraqi oil report for data collected from each of the fields produced in the country (Iraq Oil Report, 2017).

The company has about 5000 employees, and the company is headed by a Council of Management, which consists of 14 people. The Council is headed by a Director-General, who has two assistants and the heads of 11 organizations (Official website of The Missan Oil Company, 2018).

2.3 Management Information Systems

Some believe wrongly that MIS is only converting paperwork to electronic acts leading to electronic calculations. As some think that just the acquisition of computer and learn it off sponsor to provide solutions to the problems faced by management and decision-making (Almashaqba, 2013).

To understand the meaning of MIS, the responsible manager should consider the facility as a set of secondary systems or a series of secondary systems, each with its built-in input, process and output system. For example, the production enters raw materials (inputs) and is ready for sale (outputs). Also, it supports all secondary systems on the first secondary systems. The outputs of one of these systems are the inputs required for a secondary system. Each secondary system presents a set of information from other outputs and has a set of information with other outputs (El-Ebiary, 2016).

According to Lucey (2005), MIS has become synonymous with a computer, however, both concepts are not identical because MIS exists in the lives of pre-modern firms long before the advent of computer technology. This argument is supported by the fact that the computer was not used when companies kept records utilising traditional and manual information management mechanisms. Also, according to Ottih (1995), MIS is important although it indicates that the computer takes credit for the increasing attention of the MIS because it facilitates data processing which adds new perspectives to important professional choices in MIS.

Therefore, one of the approaches by which organizations can capitalise on computing capabilities is by developing MIS (Adekeye, 1997).

Based on the foregoing, MIS is a form of information systems that aims to transform data into information, which effectively contributes to improving the decision-making process and thus improving the performance of the organization.

2.3.1 Concepts and Definition of MIS

MIS is a concept of the last decade. It has been understood and described in a number of ways. According to Deoda (2015), it is also known as the information systems, the information and decision system, the computer-based information systems.

The foremost concept of MIS was to deal with data from the company and submit it at regular intervals in the form of reports. The system was largely able to process data from collection to processing. It was impersonal, requiring everyone to choose the data that was processed, selected and used for their requirements. MIS is different for people in the two firms who participated in the same work. The MIS model might be the same, but it differs greatly in content (Tripathi, 2010). Therefore, MIS is a dynamic concept that can be changed, over and over again, by changing the work administration. It constantly reacts with the internal and external environment of work and expands the corrective technique in the system, so such information requirements are effectively changed (Amenta, 2017).

There is no universally accepted definition of MIS (Adekeye, 1997). However, many researchers have agreed (Amenta, 2017; Agu et al., 2017; Surwade, 2016; Mishra, Kendhe, & Bhalerao, 2015; Yadav & Kumar, 2015; Babaei & Beikzad, 2013; Al-Mamary, Shamsuddin, & Aziati, 2013; Almashaqba, 2013; Ranisavljević et al., 2012; Lin, Chuang, & Shih, 2012; Ajayi & Omirin, 2007; Adekeye, 1997; Daodu, 1994; Argyris, 1971) that MIS is a database administration system designed specifically for the requirements of administrators or decision-makers in an enterprise (Adekeye, 1997).

According to Dantes and Hasibuan (2011), MIS is a generic term for the computer systems in an organization that provides information for its business processes as it is utilised to refer to individuals who manage these systems. Typically, the term MIS or MIS department is used by large organizations to refer to a central or centrally coordinated system of computer experience and management, predominantly involving central computer systems, but also involving the full network of computer resources of the company (Gikang, 2016).

Arrawatia and Meel (2012) and Nowduri (2011) agreed that MIS refers to a system that utilises information in order to ensure the appropriate administration of organizations. Essentially, all aspects of MIS work in conjunction to ensure the efficiency of the entire system. Therefore, failure in one part results in the failure of the other parts as they are all designed to work coherently (Davenport, & Short, 1990).

MIS can be defined according to the components of the term as follows: (El-Ebiary, 2016):

1. System is defined broadly as: A set of interconnected parts and these parts may be processes or components or a person, group, institute or anything.

2. Management can be defined as: The art of doing business through others.

3. Information is: Data processing so that it is of specific importance and these data must be handled, and the mutation more or less, so that it can be converted into so-called information.

On the other hand, according to Bafrouei, Sarlak, Mahmoudi, and Jandaghi (2013), MIS can be seen in the following three aspects:

1. From the systemic viewpoint, information systems are a combination of hardware, software, data and related technologies that are organized and integrated to receiving, process and transferring of data and information.

2. From the functional viewpoint, information systems are formed by three various systems which include information storing system, information processing system and information retrieving system. Therefore, in the process of converting data to information, initially, from the raw data center to the system and then after recording, it will be processed and finally will be presented to end-users by information search and retrieval system.

3. From the organizational viewpoint, information systems include human resources, material and instrumental resources, information centers, methods and procedures. Therefore, in this approach, the concept of organization or information institute that is expanded and comprehensive is used.

Based on these definitions, there are several inherent points of convergence (Gabriel & Obarar, 2013):

1. MIS includes the collection, processing and ultimate use of data from any available source.

2. Such data are collected regarding events in the past, present or expected in future from within and outside the enterprise.

3. It is provided to those who need them in a timely and appropriate place.

4. Eventually, it is backing the process of decision-making.

Based on previous definitions, MIS denotes a system consisting of a set of elements of inputs, processes, outputs, and feedback is intended to process the data and transform it into significative information to help upgrade the decision-making.

2.3.2 Importance of MIS

One of the names for the present period of human life is the information and communication age. It is known by this name because of the attention and extensive activities at the time of collection, processing and transfer of information (Faraji & Najafzadeh, 2016). The IT revolution has dramatically changed not only the nature of the business but also created competitive advantages for those who appreciate its effects (Elliott, 1992).

Nowadays, successful organizations rely laboriously on information systems to improve work on one hand, while on the other to concentrate on achieving goals

and benefits. MIS helps in solving both structured and unstructured environmental problems. Its primary objective is to help decision-makers provide accurate and timely information that could help them in making the right decisions in different environments (Alkhaffaf, 2012).

Whereas in a modern business environment, organizations can (no longer) compete without accurate and timely information, as contemporary organizations are mainly supported by MIS (Nedelko, 2009). Thus, the success of the decision-making process depends heavily on the information available and partly on the functions that are the process elements (Al-Zhrani, 2010). Therefore, MIS is one of the more significant achievements in the field of managerial business, which seeks to supply dependable, delicate, relevant and complete information to administrators in order to raise the organizational performance of firms (Al-Mamary, Shamsuddin, & Aziati, 2014).

According to Babu and Sekhar (2012), MIS aims to assist companies to fulfil its objectives by supplying administrators with insight into the company normal operations so that they can control, organize and plan more effectively. Moreover, MIS furnishes the right information to the right person in the right format at the right time. Also, most MIS programmes provide a lot of time and resources to their owners. In other words, business managers, through their programmability, can programme systems to detect and even resolve some shortcomings (Alam, 2014). Therefore, the role of MIS in any company is to supply information support to plan and control the performance of the organization (Ramani, 2004). Specifically, for mid-level

managers, MIS supplies organizational performance reports, which in turn assists of forecast future performance for the company (Nowduri & Al-Dossary, 2012).

According to Roll (2001), the benefits of information systems include reducing repetitive tasks, maintaining databases, providing more accurate data, and creating better relationships within a company, so that each person can access the required information, which can be regarded as a coordinated approach to the information needs of a company (Poya & Mohammadi, 2015). The positive and negative impacts of MIS are summarised in Table 2.1.

Table 2.1

Advantages and Disadvantages of MIS

No.	Benefits of MIS	Negative Impacts
1	MIS can perform calculations or process paperwork faster than people.	By automating activities that were previously performed by people, MIS may eliminate jobs.
2	MIS can help companies learn more about the purchase patterns and performances of their customers.	MIS may allow organizations to collect personal details about people that violate their privacy.
3	MIS provide new efficiencies through services such as Automated teller machines, Telephone systems or computer-controlled airplanes air terminals.	MIS are used in so many aspects of everyday life that system outages can cause shutdowns of businesses or transportation services, paralyzing communities.
4	MIS have made possible new medical advances in Surgery, radiology and patient monitoring.	Heavy users of MIS may suffer repetitive stress injury, techno stress, and other health problems.
5	The internet distributes information instantly to millions of people across the world.	The internet can be used to distribute illegal copies of software, books, articles, and other intellectual property.

Source: Adapted from M.W.Abbadi, 2010.

By reviewing Table 2.1, the researcher finds that despite the many benefits provided by information systems, there are also significant disadvantages related to its use. Also, relying heavily on information systems may lead to a decline in some of the skills possessed by workers. In addition, there will be strong future competition between man and expert systems, which will eventually reduce the need for manpower.

2.3.3 Objectives of MIS

The purpose of MIS is to assist administrators to resolve organized problems (Reddy et al., 2009). Furthermore, there is an agreement that information management systems bring management levels closer together and, by facilitating the transmission of information, enable senior management to exercise closer control over all processes (Daodu, 1994).

The following are the objectives of MIS (Surwade, 2016):

1. MIS is a very effective instrument for the effective management and control of the functions of administration. MIS will be useful in accomplishing things by supplying quick and timely information for the administration.

2. Reports give an idea about the performance of humans, materials, machinery, money and administration. Reports throw light on the exploitation of resources employed in a company.

3. MIS serves to control costs by providing information on idle time, labour turnover, waste, loss and excess capacity.

4. By comparing the actual performance, standard performance and budgeted performance, the differences are brought to the notice of management by MIS, which can be corrected by taking remedial steps.

5. MIS brings to notice the strength of administration (i.e., strong points) in a company, to take advantage of available opportunities.

6. MIS provides reports on production statistics regarding rejections, defects and damages and their impact on product costs and quality.

According to Anderson, (2000) an effective MIS must provide information with the following characteristics:

1. Information must be timely and up-to date, outdated information are useless for decision-making.

2. Information must be correct and accurate.

3. Information must be concise/confined to what is most necessary, due to the limited ability of manager to absorb huge quantities of information at once.

4. Information must be relevant, because in a given situation only a small portion of given data is useful information.

5. Information must be complete.

Based on the above, the researcher concludes that the main objectives of MIS are to obtain data and successfully manage the information thus maximising the benefit of this information.

2.3.4 Classification of MIS

Prior to the 1980s, information systems are usually classified as a data processing system or a computing system that governs the MIS. System data processing was geared towards data invasion, processing and storage, while MIS was user-oriented to the creation of information governance (Shaqiri, 2014).

A number of experts in the field of management literature have presented various MIS classifications. McLeod (1990), classified the information systems under two general systems:

First: Management Information System

These systems supply specialised information to help in the management decision-making. This objective can be fulfilled through the following subsystems of this system:

1. Executive Information Systems.

2. Decision Support Systems.

3. Information Reporting System.

Second: Operations Information System.

These systems specialised in the operation of organization-specific data, possibly through the following subsystems:

1. Office Automation Systems.

2. Control Systems Operations Process Control System.

3. Transaction Processing System Data Conversion Systems.

According to Arrawatia and Meel (2012), IS can be theorised in terms of three sorts of systems:

1. Transactional Processing Systems.

2. Management Information Systems.

3. Expert Systems. MIS has numerous subsets such as Executive Information Systems and Decision Support Systems the part on MIS in decision support is best debated in the context of the subset known as Decision Support System (DSS).

On the same note, Mason and Swanson (1981), described four divisions of MIS:

1. Databank Information System.

2. Predictive Information System.

3. Decision-Making Information System.

4. Decision-Taking Information System. The classification depends on the level of support provided by the information system in the decision-making process.

According to Yadav and Kumar (2015), there are several types of MIS in the market that offers a vast scope of profit for companies:

1. Transaction Processing Systems.

2. Decision-Support Systems.

3. Executive Support Systems.

4. Knowledge Management System.

5. Strategic Information System.

6. Functional Business System.

According to El-Ebiary (2016), MIS can be classified into:

1. Financial Information Systems.

2. Marketing Management Information Systems.

3. Information Systems in the Directorate of Operations.

4. Project Management Information Systems.

5. Organizing the Senior Management Information.

Obara (2013), highlighted the classification of MIS based on the basic administrative functions of the organization, as follows:

1. Accounting Management Information Systems.

2. Human Resources/Personnel Management Information Systems.

3. Marketing Management Information Systems.

4. Manufacturing Management Information Systems.

Based on the above, the researcher believes that the multiple classifications of information systems are due to the lack of a comprehensive definition of information systems. Also, these differences are a reflection of the lack of agreement on the functions and roles of MIS, in addition to the diversity and multiple uses of these systems. Overall, however, these classifications cover all the activities of the organization, reflecting the importance and effect of MIS for all the functions of the organization.

2.3.5 Difference of MIS and DSS

MIS and DSS are mainly abbreviated in the work administration area (Ada & Ghaffarzadeh, 2015). Although both MIS and DSS are designed to support and improve the decision-making process, but MIS can be considered as a system that provides information to assist in the formulation of intelligent queries, which can then be transferred to DSS (Abbadi, 2010). Therefore, the most important differences between them can be determined in Table 2.2.

Table 2.2

Difference Between MIS and DSS

No.	MIS	DSS
1	MIS focuses more on the information gathered and the information that has poured from different quarters.	DSS focuses more on leadership It is all about senior management in a firm providing innovative vision.
2	MIS focuses more on planning the report of various topics concerned with the organization that would assist the managers to take vital decisions pertaining to the functioning of the organization.	Experts on managerial behavior say that DSS focuses more on decision making.
3	MIS focuses on operational efficiency.	DSS focuses more on making effective decision or in other words helping the company to do the right thing.
4	Flow of information is from both sides, up and down.	flow of information is only upward.
5	The report is usually not flexible.	The report can be flexible.
6	MIS is characterized by an input of large volume of data, an output of summary reports and process characterized by a simple model.	DSS is featured by an input of low volume of data, an output of decision analysis and a process characterized by interactive model.
7	MIS is a primary level of decision making.	DSS is the ultimate and the main part of the decision.
8	MIS concentrates on supporting the top level of management down to the lower level management.	DSS were developed to support decisions from the middle level up.

| 9 | The intention of the MIS is to allow managers to familiarize themselves with the organization as a whole, and not just one particular area. | The DSS usually provides very detailed information to assist analysis of problems in one section/department of a business. |
| 10 | MIS is the ability to incorporate "what if" models in the program, as well as internal data will be examined when answering. | DSS typically only places a moderate emphasis on incorporating external data into the decision process. |

Source: Adapted from S.Ada & M.Ghaffarzadeh,2015. and M.W.Abbadi,2010.

By reviewing Table 2.2, the researcher finds that although there are many similarities between MIS and DSS, but the fundamental difference between the two is that MIS includes many functions which functions more broadly than DSS as the focus of MIS is primarily in helping decision-making. In summary, MIS focuses on operational efficiency whereas DSS focuses more on making an effective decision in assisting the company to do the right thing.

2.3.6 Elements of MIS

Al-Basheer and Shtanawi (2015) emphasised that MIS includes several main elements, namely:

a. Input/ data: It involves data entry from internal or external sources, which must take into account the accuracy of the data entry process. Any inaccuracy will lead to erroneous results affecting the nature of the output system. The data entry operation takes place through suitable devices of entry as there is a keyboard, mouse or scanner in the foreground.

b. Processing: This means processing forthcoming data and converting it into comprehensible and usable information, and the processing portion of the computer system is the brain.

c. Output: It contains information that has been processed and transported from the central processing unit to suitable output devices like a computer screen or printer... etc.

d. Feedback: Information obtained in the form of informational reports, which makes the system receives the opinions of user or decision-maker about their appropriateness to their information need or it may return to the system as an input for other practical aims.

According to Munirat, Sanni, and Kazeem (2014), the elements of MIS are the inputs/outputs control, storage and process:

1. Input: This involves a keyboard, the data users, punch cards, computer process and programmes.

2. Processing: It indicates that the mission was executed before the input is created into output.

3. Output: This is the outcome that is configured after input (data) processing.

4. Storage: It indicates to the prime and auxiliary memory. The storage of data is the basis of the information systems.

5. Control: It indicates to different measures taken to ensure timeliness, accuracy and cost-effectiveness.

Based on the above, MIS is like any system that consists of inputs, processes, outputs, and feedback.

2.3.7 MIS Model

Researchers have proposed several models for measuring the success factors of information systems (DeLone & McLean, 1992; DeLone & McLean, 2003; Myers, Kappelman, & Prybutok, 1997; Seddon & Kiew, 1996; Seddon, 1997; Pitt, Watson, & Kavan, 1995; Wixom & Todd, 2005; Gable, Sedera, & Chan, 2003; Gable, Sedera, & Chan, 2008). One of the widely accepted models is the DeLone-McLean information systems model in 1992 and the updated version in 2003. The popularity of the DeLone-McLean model can be seen in Table 2.3, whereby it has the highest citation count (original and updated versions combined).

These models assume their definition on the success of information systems and the factors that affect the success of specific information systems; models are grounded theoretically and tested experimentally. Moreover, different research has been carried out in which the success factors of the models are utilised to evaluate the information systems (Lee & Yu, 2012).

Table 2.3

Some Prominent Information Systems Success Models

Theory / Framework	Number of Citation
(Delone & Mclean, 1992)	11705
(DeLone & McLean, 2003) the updated version of (Delone & Mclean, 1992)	9956
(Seddon, 1997)	2785
(Wixom & Todd, 2005)	2553
(Pitt et al., 1995)	2257
(Seddon & Kiew, 1996)	1188
(Gable et al., 2008)	672
(Myers et al., 1997)	599
(Gable et al., 2003)	438

Source: www.scholar.google.com

By reviewing the range of studies listed in Table 2.4, the researcher concludes that there is a consensus among the researchers on the use of the six indicators of the model.

Table 2.4

Indicators of (Delone-Mclean) Model

No.	Indicators Authors	S	IQ	SQ	U	US	NB
1	(Monika & Gaol, 2017)	√	√	√	√	√	√
2	(Ojo, 2017)	√	√	√	√	√	√
3	(Wibawa et al., 2017)	√	√	√	√	√	√
4	(Agbabiaka & Ugaddan, 2016)	√	√	√	×	√	√
5	(Nindiaswari et al., 2016)	√	√	√	×	×	×
6	(Suryanto et al., 2016)	√	√	√	×	×	×
7	(Abugabah et al., 2016)	√	√	×	√	×	×
8	(Vinh & Alagar, 2016)	√	√	√	√	√	×
9	(Hu & Wu, 2016)	√	√	×	√	√	√
10	(Halim, et al., 2016)	√	√	√	×	×	×
11	(Sandjojo & Wahyuningrum, 2015)	√	√	√	√	√	√
12	(Rouibah et al., 2015)	√	√	√	×	√	×
13	(Mardiana et al., 2015)	√	√	√	√	√	√
14	(Al-Ghazali et al., 2015)	√	√	√	√	√	×
15	(Ghobakhloo & Tang, 2015)	√	√	√	√	√	√

16	(Rana et al., 2015)	√	√	√	√	√	√
17	(Hu, 2015)	√	√	×	√	√	√
18	(Al-Mamary, et al., 2015)	√	√	√	×	×	×
19	(Hazen et al., 2014)	×	√	×	√	×	×
20	(Al-mamary et al., 2014)	√	√	×	×	×	×
21	(Elham et al., 2014)	√	√	√	√	√	√
22	(Lwoga, 2013)	√	√	√	√	√	√
23	(Bossen et al., 2013)	√	√	√	√	×	√
24	(Debei et al., 2013)	√	√	√	√	√	×
25	(Lee & Yu, 2012)	√	√	√	√	√	×
26	(Chen & Lin, 2012)	√	√	×	√	√	×
27	(Gay, 2012)	√	√	√	√	√	√
28	(Sørum, et al., 2012)	√	√	√	×	√	√
29	(Alexandre & Isaías, 2012)	√	√	×	√	√	√
30	(Jafari et al., 2011)	√	√	√	√	√	√
31	(Chang et al., 2011)	√	√	√	√	√	√
32	(Fang et al., 2011)	√	√	√	×	√	√
33	(Khayun & Ractham, 2011)	√	√	√	√	√	√
34	(Kaiser & Ahlemann, 2010)	√	√	√	√	√	√
35	(Mun et al., 2010)	√	×	×	√	√	×

		S	IQ	SQ	U	US	NB
36	(Allour, 2010)	√	√	√	×	√	×
37	(Petter & McLean, 2009)	√	√	√	√	√	√
38	(Bernroider, 2008)	√	√	√	√	√	√
39	(Wu, 2007)	√	√	√	√	√	×
40	(Chien & Tsaur, 2007)	√	√	√	√	√	√
41	(Stone et al., 2007)	√	√	√	√	√	×
42	(Hussein et al., 2007)	√	√	×	×	√	√
43	(Schaupp et al., 2006)	√	√	×	×	√	×
44	(Leila A Halawi, 2005)	√	√	√	√	√	√
45	(Elmorshidy, 2004)	√	√	√	√	√	√
Conclusion		freq. 44	% 97	freq. 44	% 97	freq. 35	% 77	freq. 33	% 73	freq. 37	% 82	freq. 26	% 57

Note, S=System Quality; IQ= Information Quality; SQ= Service Quality; U= Use of System; US= User Satisfaction and NB=Net Benefits.

Therefore, in this study, we relied on the six indicators which are system quality, information quality, service quality, use of system, user satisfaction, and net benefits.

The DeLone and McLean model has contributed significantly to the literature measuring the success of information systems because it was the first study to attempt to force some order on information systems (Seddon, Staples, Patnayakuni, & Bowtell, 1999).

Although the model incorporates the comprehensive independent variables used by researchers in information systems, it has received much criticism. First, the information systems used in the DeLone and McLean models provide many explanations. Also, the use of information systems plays a complex and controversial role in the success of the modeling system. Secondly, since user satisfaction represents the individual effects of information systems in a regulatory framework, investigating the cause of user satisfaction on individual influences is critical. Finally, and more importantly, the model does not plainly and completely explain the relationship between user satisfaction and individual/organizational effect (Garrity, Glassberg, Kim, Sanders, & Shin, 2005).

Ten years later, DeLone and McLean, (2003) offered an updated model reflecting the criticism of others and the situation at the time. The service concept was added to IT with the use of the internet, including service quality. It comprises several constructs as follows:

a. System Quality

System quality is a desirable characteristic of information systems (Petter, DeLone, & McLean, 2008). It is concerned with whether or not there are bugs in the system, the consistency of the user interface, and ease of use (Seddon, 1997). Also, it considers both performance characteristics and functionality (Urbach, Smolnik, & Riempp, 2009). In addition, the system quality represents the quality of processing the information systems itself, which contains software and data elements, and also measures the success of the system (Lee & Yu, 2012).

System quality is also a key factor that affects the acceptability of information systems and improving organizational performance (Al-mamary et al., 2014). According to Gorla, Somers, and Wong (2010), it is assumed that system quality is positively associated with information quality and organizational effect. Furthermore, Raymond and Bergeron (2008) confirmed that the quality of the information outputs is strongly related to the technical and service aspects of the system, i.e. to the quality of the system.

b. Information Quality

Information quality is defined as the degree to which information generated by the website is delicate, pertinent, complete, and in the form required by the user (Schaupp et al., 2006). Petter et al., (2008) emphasised that the desirable characteristics of the system outputs are where the information is of high-quality and fulfils the user requirements (Kaiser & Ahlemann, 2010). Information systems are generated to supply valuable information for decision-making for people and groups by storing, maintaining, processing and managing resources of information (Lee & Yu, 2012).

According to Lee, Strong, Kahn, and Wang (2002), information quality has become an important concern for organizations and play an active role in MIS research. Therefore, a company needs to pay attention not only to the system quality to improve the quality of the information produced but also to improve the organization's performance (Al-mamary et al., 2014).

c. Service Quality

To date, service quality is the most researched area in services marketing (Fisk, 1993). Service quality is founded on a comparison between what the customer feels should be offered and what is provided (Pitt et al., 1995). This success dimension covers various aspects such as responsiveness, reliability, empathy, competence, and overall quality (Urbach et al., 2009).

Most studies have established that there is a positive relationship between service quality and performance (Jafari, Forouzandeh, & Hashemi, 2015). The impact of service quality can be understood from the effect of a company's service quality on the company's performance. Therefore, the promotion of service quality could enhance organizational performance (Cheng & Lin, 2014), as organizational success depends on how well the information system services are delivered. Furthermore, the reliability of service quality will result in timely and efficient decision-making, which, in turn, will improve internal organizational efficiency (Gorla et al., 2010).

d. Use of System

According to Seddon (1997), using the system refers to the degree and method to which employees and customers use the capabilities of the information system. For example, the amount of use, frequency of use, nature of use, fitness for use, the extent of use, and the aim of use (Petter et al., 2008).

Kroll (2015) explained that the relationship between the use of information systems and their impact on organizational performance is a positive relationship and a significant improvement in the organizational performance of the organizations.

e. User Satisfaction

User satisfaction is one of the most significant measures when verifying the success of information systems in general (Urbach et al., 2009). It is a factor that improves the levels of service or system performance that users feel for the success of the information systems (Lee & Yu, 2012). For example, the level of user satisfaction covers reports, websites, and support services (Ives, Olson, & Baroudi, 1983).

In the first place, the relationship between satisfaction and performance has been the object of in-depth and disparate studies for many decades (Ouedraogo & Leclerc, 2013). Mulyani, Hassan, and Anugrah (2016) clarified how it positively affects the satisfaction of information systems users on their performance thus improving the performance of the organization.

f. Net Benefits

This construct summarises the benefits that can be gained by users, benefits completing their own tasks (Kaiser & Ahlemann, 2010). These benefits cover aspects of task performance, job efficiency, improved use and exchange of knowledge, improved communication, and total benefit (Urbach et al., 2009). Other benefits include increased sales, cost reductions, improved profits, market efficiency, consumer welfare, creating jobs, and economic development (Petter et al., 2008).

Furthermore, Halawi, McCarthy, and Aronson (2008) specified that there is an important relationship between net benefits as measured by improvements in the performance and intention to use. Thus, it is assumed that high-performance leads to greater intention to use. Subsequently, MIS can impact organizations in different

ways. For example, to raise operating efficiency and revenue and customer satisfaction, to lower costs, to fulfil the objective and business strategy, and to raise the performance of organizations (Boonmak, 2007).

2.4 Total Quality Management

The concept of quality is not limited to products but also includes the production, organization and design functions that may be linked with an accurate product or service including the persons participating in such processes. TQM is a managerial philosophy that includes all dimensions of quality that are of interest to both the customer and the enterprise (Sawalim, 2014).

TQM has emerged as a new paradigm for the management of product and service quality (Ayers, 1993). TQM is a managerial approach which was created in the 1950s and has become more common since the early 1980s (Siam et al., 2012).

The recognition of TQM as a competitive advantage is widespread all over the world, especially in Western countries. Today, very few (especially manufacturing) firms can endure disregarding the TQM term (Dean & Bowen, 1994) as TQM is based on the assumption that a company will seek lasting success. This desire by the company determines the circumstances in which the human and the material resources of the company are designed to achieve the goals that have been effectively adopted, such as customer satisfaction, enterprise profit, and employee satisfaction (Górny, 2018).

Based on the foregoing, TQM is an administrative philosophy aimed at building quality rather than examining, by making quality the responsibility of all employees of the company.

2.4.1 Concept and Definition of TQM

Many researchers believe that TQM is an enterprise-wide philosophy which has been pursued to improve the quality of products/services and processes in order to meet or exceed customer anticipations (Shafiq, Lasrado, & Hafeez, 2017; Anil & Satish, 2016; Nekoueizadeh & Esmaeili, 2013; Al-Kassem, In'airat, & Bakri, 2013; Mellat-Parast, 2013; Gharakhani, Rahmati, Farrokhi, & Farahmandian, 2013; Wang, Chen, & Chen, 2012; Ooi, 2012; Talib, Rahman, & Qureshi, 2011; Guion, 2010; Sadikoglu & Zehir, 2010; Kumar, Choisne, Grosbois, & Kumar, 2009; Moghaddam & Moballeghi, 2008; Vouzas & Psychogios, 2007; Nair, 2006; Boon, Safa, & Arumugam, 2006; Prajogo & Mcdermott, 2005; Rad, 2005; Pheng & Teo, 2004; Kaynak, 2003; Montes, Jover, & Fernández, 2003; Cheon & Stylianou, 2001; Martinez-Lorente, Dewhurst, & Gallego-Rodriguez, 2000; Au & Choi, 1999; Terziovski & Samson, 1999; Kiella & Golhar, 1997; Hackman & Wageman, 1995; Powell, 1995; Sitkin, Sutcliffe, & Schroeder, 1994; Flynn, Schroeder, & Sakakibara, 1994).

According to Bemowski (1992), the term TQM was first utilised in 1985 by the Naval Air Systems Command to describe the Japanese management style that focuses on quality improvement. In his study, Deming (1986), stressed that TQM is

an administrative philosophy that uses a certain set of principles, practices and techniques to expand business and profit. Unambiguous, and increasing market share is a direct result of better quality that provides an override for improved productivity by avoiding re-employment, rejection, waste, customer complaints, and high cost (Rahman & Siddiqui, 2006).

Juran (1988) pointed out that TQM is a philosophy aimed at achieving overall performance. TQM has become a global strategic force, which can lead to many benefits: improving customer satisfaction, increasing staff concentration and motivation, minimising waste and improving overall performance.

Mossard (1991) defined TQM as a philosophy which is based on the current situation and future development, using quantitative analysis and human resources to improve the provision of material and services for the organization, and improving the overall operation process of the organization, and enhancing satisfactory level of consumers need.

TQM has been defined as a comprehensive set of management practices to manage the organization in order to achieve its objectives while meeting customer requirements for business success (Hackman & Wageman, 1995; Dean & Bowen, 1994). According to Terziovski, Sohal, and Samson (1996), TQM is the intensive management of information. Information plays a pivotal role in all quality improvement activities which is based on informed decision-making.

Yusof and Aspinwall (2001) proclaimed that TQM is a philosophy that presents a business system that companies should adopt to achieve organizational excellence. According to Brah, Tee, and Rao (2002), TQM is a group of guiding principles and practices, in addition to a philosophy, that addresses not only the management of quality but also the quality of management.

Escrig-Tena (2004) stressed that TQM can be understood as a strategic measure that focuses on managing the enterprise as a whole to supply patrons with products or services that meet their needs, through the mobilisation of personnel, management leadership and cohesion of all the company's resources. According to Martínez-Costa, Martínez-Lorente, and Choi (2008), TQM is typically defined as a system of practices with an overarching or systematic impact on the organization's practices and performance. Holjevac (2008), declared that TQM is a system to enhance and improve flexibility and perform effective and efficient work. According to Khanna (2009), TQM is also a term used to describe a comprehensive view of quality assurance.

Siam et .al (2012) pointed out that TQM is an administrative approach for improving organizational performance that encompasses a variety of topics, both technical and behavioural. On the other hand, Alzhrani, Khadijah, and Alotibie (2016) stressed that TQM placed focus on quality and minimise the defects as much as possible in the product or service provided. According to Bouranta, Psomas, and Pantouvakis (2017), TQM can be seen as an administrative philosophy based on a set of theoretic principles, practices, tools and methodologies. According to Matta, Chen,

and Tama (1998), definitions of TQM all have the same main attributes, which can be summed up in the following nine dimensions :

• Leadership; • strategic planning process; • output quality assurance; • supplier quality assurance; • important innovations; • information and analysis; • human resource utilisation; • customer satisfaction; • quality results.

2.4.2 Importance of TQM

Why is quality important? According to Dale, Wilele, and Iwaarden (2007), to answer this question, just consider the unsatisfactory examples of product and/or quality services that you, the reader have experienced, the bad feelings it gave you, the resulting actions taken and the people you told about the experience and the outcome.

According to Juran, international competition requires higher levels of quality achievement by organizations (Blackiston, 1996). In today highly competitive markets, demand for quality is the single most important factor for firms to survive in an expanding global market (Curkovic, Melnyk, Calantone, & Handfield, 2000).

Moghaddam and Moballeghi (2008) considered that TQM is a way of life for an organization. Dean and Bowen (1994) Au and Choi (1999) and Agus and Sagir (2001) pointed out that TQM is not just another management fad; it is capable of delivering a real competitive advantage. World-class manufacturing firms have gained competitive advantage and greater market share through exceptional levels of

performance by providing quality products at competitive prices as required by demanding customers (Zakuan, Yusof, Laosirihongthong, & Shaharoun, 2010).

TQM is more than just a programme; it is a way of managing the business of the company (Yusuf et al., 2007) as TQM is one of the most significant evolution in management practices for managing a business effectively (Haffar, Al-Karaghouli, Djebarni, & Gbadamosi, 2017; Prajogo & Sohal, 2003). Also, it has increasingly become a strategic tool for successful organization management (Olian & Rynes, 1992). In practice, TQM emphasises that every part and person of an organization works together for the clients need and continuous improvement (Yusuf, Gunasekaran, & Dan, 2007). Also, TQM is the key to the success of global manufacturing and service firms. To fulfil this goal, TQM practitioners have generated a combination of tools and practices (Nguyen, 2006).

TQM's level of interest has increased significantly (Porter & Parker, 1993), and it has grown into a solid research field (Sha'Ri Mohd Yusof & Aspinwall, 1999). Also, in recent years, administrators have been widely exposed to the accomplishments of Japanese and Western companies that have achieved TQM (Agus, 2004).

According to Jayaram, Ahire, and Dreyfus (2010) Sweis, Shanak, El-Samen, and Suifan (2014) and Munizu (2013), TQM has been adopted excessively by companies in the past 50 years, but firms still report less than optimal results. Companies that have been successful with TQM have found that new staffs have a greater request for delicate and timely information. Employees must be able to

communicate through organizational levels, functions, product lines, and problem-solving sites between departments and to manage effectively the changes required by applying TQM (Jones, 1988).

TQM creates a wide range of benefits, involving improved intercom, improved problem-solving, increased staff commitment and motivation, stronger relationships with suppliers, a better understanding of client's needs, improved client satisfaction, fewer errors and reduced waste (Powell, 1995). Also, the advantages that an organization can achieve by introducing the TQM system in practice have been confirmed. According to Holjevac (2008), these involve:

1. Improved quality of products and services.

2. Greater customer satisfaction. Better competitive ability and market strength . Reduced business costs.

3. Increased business profits. Greater employee satisfaction.

4. Enhanced management quality.

5. Better company reputation and reliability.

6. Increased social responsibility and ethics.

The most important benefits of TQM can be summarized as follows (Cheon & Stylianou, 2001):

1. Improvements in quality and productivity (e.g., higher quality products; lower maintenance costs; reduced application development time).

2. Improvements for staff and management (e.g., better utilisation of human resources; better management control; increased morale, teamwork and job satisfaction).

3. Improved relations with customers (e.g., increased customer focus, customer satisfaction, and awareness of the importance of service; increased flexibility in meeting customer demands) and

4. Strategic benefits (e.g., increased alignment with corporate culture and organizational objectives and better targeting of business value).

2.4.3 Objectives of TQM

The application of TQM aims to improve quality to raise efficiency and to fulfil a high-level of sophistication (Mitreva, 2014). TQM implementation is a competitive advantage which increases the performance of organizations (Tabe, Rezaeekelidbari, & Chegini, 2013).

The purpose of TQM is not only to provide the foundation of a constantly evolving system but also to guarantee a competitive and stabilised position by the continuous development of quality. A system can have an excellent product if it is of high-quality. The philosophy of TQM comprises five basic rules: senior management commitment, customer focus, continuous improvement, organizational problem-solving processes, and employee empowerment (Cheon & Stylianou, 2001).

According to Bounds, Yorks, Adams, and Ranney (1994), TQM focuses on customer value, cross-functional systems and continuous improvement. Zero defects mean that the final objective of TQM is to reduce defects in products and services that may emerge in order to achieve no shortcomings (Lin et al., 2012).

Based on the above, the main objective of TQM is to make quality the responsibility of all employees of the company and not just the responsibility of a specific department.

2.4.4 Requirements for TQM

The application of TQM typically consists of the philosophy from Deming's 14 points, Juran's 10 steps and Crosby's 14 steps, which are classified as soft TQM, and tools and techniques which are classified as hard TQM (Huarng & Chen, 2002). One of the best-known descriptions of the requirements for TQM in organizations is found in Deming's 14 Points for Management (Jordan, 1997):

1. Create constancy of purpose for the improvement of product and service.

2. Adopt the new philosophy.

3. Cease dependence on mass inspection.

4. End the practice of awarding business on the basis of price tag alone.

5. Improve constantly and forever the system of production and service.

6. Institute training and retraining.

7. Institute leadership.

8. Drive out fear.

9. Break down barriers between staff areas.

10. Eliminate slogans, exhortations, and targets for the workforce.

11. Eliminate numerical quotas.

12. Remove barriers to pride of workmanship.

13. Institute a vigorous programme of education and retraining.

14. Take action to accomplish the transformation.

Based on the above, there are no agreed requirements for the application of TQM except Deming's 14 points, Juran's 10 steps and Crosby's 14 steps which can be considered as the basis for an organization to implement TQM.

2.4.5 TQM Practices

There are many TQM models utilised for self-assessment. These models are an expression of the definitions of TQM in a broad sense concerning the company and all its activities (Wali, Deshmukh, & Gupta, 2003). The criteria of awards are well defined and generally accepted as significant for each company (Brown & Wiele, 1996). The most important examples of TQM can be found in Table 2.5.

Table 2.5

Models of Quality Awards

Awards Dimensions	DPI 1951	MBNQA 1987	AQA 1988	MQA 1990	EQA 1991	CQA 2001	Freq.	%
Leadership	√	√	√	√	√	√	6	%100
Strategic Planning	√	√	√	√	√	√	6	%100
Customer Focus		√	√		√	√	4	%66.6
Information & Analysis	√	√	√	√		√	5	%83.3
Human Resource		√	√	√	√	√	5	%83.3
Process Management		√	√		√	√	4	%66.6
Business Results		√					1	%16.6
Policies	√						1	%16.6
organization & its operations	√						1	%16.6
Education & dissemination	√						1	%16.6
Standardisation	√						1	%16.6
Quality Assurance	√			√			2	%33.3
Resources					√		1	%16.6
Effects	√						1	%16.6
Quality innovation improvement				√			1	%16.6

Note, DPI= Deming Prize; MBNQA= Malcolm Baldrige National Quality Award;
AQA = Australian Quality Award; MQA= Malaysian Quality Award; EQA=
European Quality Award and CQA= China Quality Award.

Source: Adapted from A.Ghobadian & H.S.Woo, 1996. and M.R.Kumar, 2007. and

J.Y.Xiang, Z.He, Y.H.Suh, J.Y.Moon, &Y.F. Liu, 2010. And V.Prybutok, X.Zhang,

& D.Peak, 2011. and O.K. Boon, 2013.

The MBNQA model consists of seven dimensions, six of which are present in almost all these models, namely, (leadership, customer focus, human resource, strategic planning, process management and information & analysis).

Many researchers have used these six TQM constructs identified by the MBNQA, as shown in Table 2.6.

Table 2.6

Practices of (Malcolm Baldrige) Model

No.	Practices Authors	L	CF	HR	SP	PM	IA	BR
1	(Psomas, et al., 2017)	√	√	√	√	√	√	×
2	(Haffar et al., 2017)	√	√	√	√	√	√	×
3	(Oliveira, et al., 2017)	√	√	√	√	√	×	×
4	(Shafiq et al., 2017)	√	×	√	√	√	×	×
5	(Lee & Ooi, 2015)	√	√	√	√	×	×	×
6	(Valmohammadi & Roshanzamir, 2015)	√	√	√	√	×	×	×
7	(Delic, et al., 2014)	√	√	√	√	√	×	×
8	(Sawalim, 2014)	√	√	×	×	√	√	×
9	(Tan, 2013)	√	√	√	√	√	√	×
10	(Bon & Mustafa, 2013)	√	√	√	×	×	√	×
11	(Boon, 2013)	√	√	√	√	√	√	×
12	(Yunis, et al., 2013)	√	√	√	×	√	×	×

13	(Jaeger,et al., 2013)	√	√	√	√	√	√	√
14	(Ooi, 2012)	√	√	√	√	√	√	×
15	(Fotopoulos & Psomas, 2010)	√	√	√	×	×	√	×
16	(Guion, 2010)	√	√	√	√	√	√	×
17	(Zakuan et al., 2010)	√	√	√	√	×	√	√
18	(Bou-Llusar, et al., 2009)	√	√	√	√	√	×	×
19	(Jung, et al., 2009)	√	√	√	√	√	×	×
20	(Arumugam, et al., 2008)	√	√	√	×	√	√	×
21	(Fening, et al., 2008)	√	√	√	√	√	√	√
22	(Lam, et al., 2008)	√	√	√	√	√	√	√
23	(Prajogo & Hong, 2008)	√	√	√	√	√	√	×
24	(Sila, 2007)	√	√	√	√	√	√	×
25	(Feng, et al., 2006)	√	√	√	√	√	√	×
26	(Nair, 2006)	√	√	√	×	√	√	×
27	(Prajogo & Sohal, 2006a)	√	√	√	√	√	√	×
28	(Prajogo & Sohal, 2006)	√	√	√	√	√	√	×
29	(Nguyen, 2006)	√	√	√	×	√	√	×
30	(Davis & Stading, 2005)	√	√	√	√	√	√	√
31	(Prajogo & McDermott, 2005)	√	√	√	√	√	√	×
32	(Prajogo & Sohal, 2003)	√	√	√	√	√	√	×
33	(Prybutok, et al., 2011)	√	√	√	√	√	√	√

		F	%	F	%	F	%	F	%	F	%	F	%	F	%
34	(Curkovic et al., 2000)	√		√		√		√		√		√		√	
35	(Samson & Terziovski, 1999)	√		√		√		√		√		√		×	
	Conclusion	F	%	F	%	F	%	F	%	F	%	F	%	F	%
		33	100	34	97	34	97	28	80	30	85	27	77	7	20

Note, L= Leadership; CF= Customer Focus; HR= Human Resource; SP = Strategic Planning; PM= Process Management; IA= Information & Analysis and BR= Business Results.

The MBNQA was established in 1987 by the US Congress to recognise American organizations for superlative performance and quality (Prybutok et al., 2011). These six TQM practices can be categorised into soft and hard elements (Wilkinson, 1992).

The soft elements promote awareness among the employees regarding the customers' requirements and encourage quality management in the company. These involve leadership practices, customer focus and human resource management. As for the hard elements, they seek to enhance the production techniques as well as to improve the business processes within companies which involve practices such as strategic planning, process management and information and analysis (Yong & Wilkinson, 2001). Furthermore, many of the manufacturing companies in high-tech industrialised countries, such as the European countries, USA, Japan, and Australia have implemented these six practices and found them to be successful (Samson & Terziovski, 1999).

Many renowned researchers (Psomas, et al., 2017; Haffar et al., 2017; Jaeger et al., 2013; Tan, 2013; Prajogo and Hong, 2008) have also used these six TQM

dimensions to develop their framework and examine the relationships between TQM with different variables (Ooi, 2012). Through the extensive review of past literature, the six TQM practices were chosen.

a. The Practices of Leadership

The importance of top management support and their leadership in TQM has been emphasised repeatedly in the theoretical and empirical quality literature (Ang, Davies, & Finlay, 2001). Commitment in management involves participative management which, enables all members of the organization to focus on achieving overall quality goals and to adhere to regulatory systems designed to ensure total quality (Ugboro & Obeng, 2000) as the leadership is related to the outlet for other practices. Evans (1996) emphasised that the leadership of an organization which promotes quality and high-performance create a strategic vision and clear values which serve as a basis for all business decisions at all levels of the organization and that the vision and values revolve around customers.

Studies have found that leadership improves performance (Sadikoglu & Olcay, 2014). Raghunathan, Rao, and Solis (1997) noted that leaders play an important role in deciding how TQM practices are projected in a consistent manner where it affects organizational performance and profitability. Therefore, leadership is deemed the fundamental driver of business excellence (Kanji, 2001).

b. Customer Focus

The customer determines quality. Thus, it is significant for any company to pay immediate attention to customer focus. Customer focus may be the key factor in assisting companies to define their vision for the future (Siam et al., 2012). Waldman (1994) pointed out that the customer can be viewed both internally and externally as a potential partner. As an organization, the ability to exceed customer expectations is to understand the needs and requirements of customers. Organizations must listen, collect customer data, analyse and understand what customers want (Fening et al., 2008) in order to exceed customers' expectations and anticipate their needs (Ang et al., 2001).

Studies have found that customer focus positively affects performance (Sadikoglu & Olcay, 2014). Dadfar, Brege and Semnani (2013) conclude that service organizations must build strong customer relationships in order to improve their performance. Therefore, customer focus is considered an essential element in production. Accordingly, it is expected that customer focus will enhance organizational performance and eventually improve the relationship between customer focus and organizational performance (Sweis, Saleh, Al-etayyem, Qasrawi, & Mahmoud, 2016).

c. Human Resource Management

Human Resource Management is another criteria factor of TQM in company service that is strongly associated with customer satisfaction within organizations (Saleh & Hasan, 2015) by managing staff to work jointly in groups within a company in order to improve organizational performance (Sit, Ooi, Lin, & Chong, 2009). Moreover, it

has a fundamental role in TQM practices to be effective and efficient (Abu-Doleh, 2012).

The participation and empowerment of staff appear to be vital to the application of TQM. The importance of these factors seems to increase as quality efforts mature in the application of TQM. The importance of these factors seems to jointly include staff and administration to enhance ownership and commitment. With these elements, training plays a pivotal function in developing the skills necessary to allow continuous employees' participation and empowerment (Siam et al., 2012).

Along with this idea, Talib et al. (2011) stated that human resource management is important for improving business performance and management processes. As a result, it is a critical success factor in any successful TQM application as it is correlated positively with quality performance (Talib, Rahman, & Qureshi, 2013). The participation of an organization's staff can help to modify and improve the negative attitudes of some staff, to reduce the difference caused by work pressure, and provide a good understanding of the importance of their role in producing high-quality products and to create a good organizational culture (Boateng,Okrah & Appiah Fening, 2012).

Human resource development is correlated positively with organizational performance (Zakuan et al., 2010). Therefore, human resource development is one of the crucial success factors in benchmarking practice, which assists in improving the processes of business and management (Deros, Yusof, & Salleh, 2006).

d. Strategic Planning

Strategic planning is also an important success factor in TQM. Ideally, this involves defining long-term and short-term organizational vision/mission (Tari, 2005). Appropriate systems for quality planning will lead to efficient product quality and thus customer satisfaction (Chong & Rundus, 2004).

Strategic planning discovers the degree to which quality vision is clear so that it can develop a plan according to quality standards. Likewise, it measures the degree to which all members of the board of strategic planning are aware of the participation of customers, shareholders and suppliers. It also measures the effectiveness of the plan in attaining achievable operational objectives (Oliveira et al., 2017).

Previous studies have found that strategic planning is positively associated with performance (Sadikoglu & Olcay, 2014). Also, many researchers consider that strategic planning is one of the crucial success factors of TQM (ALNasser, Yusoff, & Islam, 2013). Feng et al., (2006), in his comparative study found that there is an important effect on strategic planning in TQM practice with organizational performance.

e. Process Management

Process management is also one of the key factors for the success of TQM (Saleh & Hasan, 2015). The focus of this factor is managing processes to provide high-quality products and services (Jamali, Ebrahimi, & Abbaszadeh, 2010). This component can be defined as an organized way to improve the performance of a company by

allocating and utilising obtainable resources efficiently and effectively (Sit et al., 2009).

According to Kristal, Huang, and Schroeder (2010), process management is considered the implementation of process control with the aid of statistical process control methods. There are many techniques for controlling statistical processes such as control schemes, graphs of effects, scattered charts, and Pareto charts.

All activities within the company can be divided into core tasks or processes, and these core processes are linked together in the quality chain. Being in a chain, all operations will have an impact on one another (Yong & Wilkinson, 2001). Also, it assists companies in identifying and reducing the occurrence of errors (Ahire & Dreyfus, 2000).

Empirical studies established a positive correlation between process management and organizational performance (Fotopoulos & Psomas, 2010). Process management deals with the practice of quality management as a means of achieving high-performance in company activities and processes. It includes the use of tools and techniques to improve quality, the presence of statistical analysis and control, and the documentation of critical standard processes (Oliveira et al., 2017).

f. Information and Analysis

Information and analysis cover a broad scope of topics that are related to information and knowledge management, measurement and analysis of organizational performance (Ju, Lin, Lin, & Kuo, 2006).

Information plays a pivotal role as all quality refinement activities are based on making informed decisions (Terziovski et al., 1996). A firm's database must be inclusive and cover all crucial areas such as customers, suppliers, workers and projects/processes (Flynn et al., 1994).

Since managing quality generates a great deal of data, it is important to identify which data are worth retaining and how to organize it in an accessible structure. Databases should be able to facilitate the processing of various data and in-depth analysis to meet the information requirements of each level (strategic, tactical and operational) for activities of decision-making (Collins, 1994 ، Lin, 1991). Thus, meeting customer's needs and expectations is the baseline for any business. Satisfaction is achieved when meeting customer's needs and expectations (Sit et al., 2009). In this study, six of the dimensions were adopted.

Information and analysis of TQM practices are correlated positively with organizational performance (Zakuan, Yusof, & Laosirihongthong, 2008). Moreover, Prajogo (2005) investigated the important effect of information and analysis of TQM on quality performance. This was supported by Lee, Rho and Lee (2003), who showed that the quality information and analysis derived from the empirical study have a positive impact on process management.

2.5 Organizational Performance

The competitive market has become increasingly dynamic, prompting firms to react as quickly as possible, and making the necessary adjustments and changes. This race to participate in the market requires companies to monitor performance indicators closely so that they can assess whether operations and activities are satisfactorily implemented to the extent that they are passed as an advantage over competitors, which has a major impact on corporate profitability (Silva & Borsato, 2017). Furthermore, in today's dynamic business environment, competition has increased, and sustainability has become an issue. Organizational performance has been the main focus in the implementation of measures to ensure competitiveness and sustainability (Wang, Bhanugopan, & Lockhart, 2015).

According to Hashim (2007), the goal of improving organizational performance is to ensure that the resources of the organization and system designs process have systematically improved its performance to incur higher productivity and better financial outcome. In organizational performance, the measurement compares the expected results with actual results, verifies deviations from plans, evaluates individual performance, and examines progress towards target goals.

Organizational performance involves both financial and non-financial performance. The first indicates the tangible or cash benefits such as return on investment, revenue and profit margin, while the latter indicates customer satisfaction, growth and other intangible benefits (Muthuveloo, Shanmugam, & Teoh, 2017).

Based on the foregoing, we conclude that organizational performance is the effort exerted by an enterprise to achieve its goals and represents the outcome of its activities.

2.5.1 Concepts and Definition of Organizational Performance

Organizational performance is one of the most important constructs in management research (Richard, Devinney, Yip, & Johnson, 2009). Where organizational performance was and still is an endless research question with many studies considering it as their dependent construct (Cameron, 1986). Increased research into organizational performance has led to different and partly contradictory definitions and theories (Selden & Sowa, 2004).

Organizational performance is difficult to define because there are many different perspectives on performance, and also, the indicators of performance are complex (Swanson, 1995; Ford & Schellenberg, 1982). Although many authors have different definitions of performance (Ramayah, Samat, & Lo, 2011).

Organizational performance is the measure of progress of an organization, which is an analysis of the performance of the institution compared to the objectives (Otley, 1999). According to Venkatraman and Ramanujam (1986), there are three performance levels within companies. These are classified as financial performance, work performance and organizational effectiveness, although the latter is later known as organizational performance (Kuei, Madu, & Lin, 2001). Nevertheless, many

researchers express organizational performance as referring to an organization's index to measure its achievement (Holton, 2002; Li et al., 2005; Ho, 2008).

The literal meaning of performance is the mood or function of operation quality. Therefore, organizational performance is a structure that refers to how organizations operate most of the functions (Tabe et al., 2013). Neely and Adams (2002) expressed organizational performance as "the explaining of the quality effectiveness and past efforts efficiency". Thus, performance can be defined as the capability of an entity to produce results in a dimension determined a priori, in relation to a target (Laitinen, 2002).

According to Robbins and Coulter (2017), the common measures for organizational performance are organizational productivity and organizational effectiveness. Organizational performance is described as the range to which the company is able to meet the needs of owners and stakeholders for survival (Griffin, 2003).

Kaplan and Norton (2005) claimed that organizational performance is determined by an enterprise's ability to use its resources to foresee its future. Meanwhile, according to Ruey-Gwo and Chieh-Ling (2007), organizational performance can be defined as the results of the operations performed by members of the company.

The definition of organizational performance refers to an organization's index to measure the extent to which its objectives are met (Valmohammadi, 2012; Khang,

Arumugam, Chong, & Chan, 2010). According to Wahda (2017), organizational performance is defined as an achievement of an organization measured by certain standards within a certain period.

Based on the above, the researcher argues that the concept of organizational performance is centered on the following:

1. It's the effort of the company as a whole.

2. Represent a reflection of organizational efficiency and effectiveness.

3. Improve the company's ability to achieve its long-term goals.

4. Expresses the extent to which the company's management uses its available resources.

5. Outputs of activities occurring within the company.

2.5.2 Importance of Organizational Performance

We live in a society in which high-performance has become an important determinant of organizational survival and sustainability (Hijal-Moghrabi, Sabharwal, & Berman, 2015).

As we embark on an age of globalisation and digitisation, the interest in achieving high organizational performance amidst existing and emerging challenges is also increasing (Yunis, Jung, & Chen, 2013). It plays a vital role in developing, achieving, and controlling a strategic plan and determining the future direction (Teeratansirikool, Siengthai, Badir, & Charoenngam, 2013).

In the ever-growing competitive environment, organizational performance is the primary fundamental variable for management researchers in terms of market competition to succeed in gaining customers, inputs and capital in market competition (Richard et al., 2009). Therefore, organizational performance is the company's growth measure (Simonin, 1997) whereas performance is one type of effectiveness indicator (Venkatraman & Ramanujam, 1986).

Measuring and improving performance is key to guaranteeing the successful application of the organization's strategy (Laitinen, 2002). Wang et al., (2015) claimed that performance is the core of all activities in the organization as it determines the extent to which the organization remains an organizational performance reflecting the way in which the organization uses its tangible and intangible resources to achieve its objectives. Therefore, in order to achieve a high-performance organization with strong financial results, customer satisfaction and high staff morale, the organization should focus on strategies to achieve sustainable growth and financial performance; the ability to adapt quickly to change and spend much effort on developing its workforce (Waal, 2007).

Based on the above, the researcher believes that performance represents the summary of the work of the organization and the output in which the continuation or death of the organization depends.

2.5.3 Measurement of Organizational Performance

Organizational performance can be considered a multidimensional construct consisting of more than just financial performance (Baker & Sinkula, 2005). A balanced and complete assessment of an organization's performance should consist of different dimensions of performance (Richard et al., 2009) since organizational performance cannot be done without integrating systems, processes, individuals, customers, partners and administration (Tangen, 2003; Jyoti & Sharma, 2012).

Saeed et al. (2013) emphasised that many variables affect performance. These variables involve managerial position, organizational culture, personal problems, job content and financial rewards. All these variables have a positive effect on the employee's performance except the personal problems of employees that impede the employee's performance.

Luarn and Huang (2009) claimed that three factors were affecting performance, namely task-technology fit, computer self-efficacy, and utilisation. Organizational performance is affected by the environment, objectives, and strategies for accomplishing the objectives of an organization. A unanimous factor cannot be used as a measure of performance for all types of organization (Liu & Fu, 2011).

Stoelhorst and Raaij (2004) referred to market orientation as the marketing explanation for performance disparities between organizations. Here, the market trends reinforce the performance of the organization by providing differentiation and cost advantages (Li & Zhou, 2010).

The performance of any organization depends on linking the capabilities and potentials, capabilities and skills to the strategic objectives of the organization through the adjustment between the organization and the individual. The strategic objectives of the organizations are measured through performance indicators (Popova & Sharpanskykh, 2010). These indicators are goal specific and are the main building blocks of performance (Popova & Sharpanskykh, 2010) which correspond to either financial or non-financial measures of organizational performance (Khan & Vihinen, 2010). Performance measurement aims to contribute to improving the performance of an organization by showing the main areas the staff should focus on in their work, as the evaluation of corporate performance is critical to various parties (Dinçer, Hacıoğlu, & Yüksel, 2017).

In the past, organizational performance has often been assessed through financial-based performance measures. Some of the most widely used financial measures are Return on Assets (ROA), Return on Investments (ROI), Return on Equity (ROE), market share, sales growth, and profitability (Rhodes, Hung, Lok, Lien, & Wu, 2008; Ha, Lo, & Wang, 2016).

Corredor and Goñi (2011) studied the impact of financial and non-financial performance. Cho, Hong, and Hyun (2009) the impact of return on investment and return on assets on organizational performance. Guest (1997) used return on investment, profit as financial measures of the firm's performance whereas Becker, Huselid, Pickus, and Spratt (1997) used profit and growth, and market share. Furthermore, Richard and Johnson (2001), expanded on this by using both profitabilities and return on equity whereas Tzafrir (2005) used net profit, return on

equity and return on assets. Golicic and Smith (2013) used financial, market and operational performance. The findings of Koech and Namusonge (2012) explained that organizational performance was represented to the extent that business purposes were achieved in the former financial year of the organization. Alsughayir (2014) further evaluated performance by comparing performance with competitors' performance in terms of organizational effectiveness, financial and business performance.

Although these indicators are still the ultimate goal of most enterprise operations, limiting the measurement performance to these indicators is no longer appropriate (Gomes, Yasin, & Lisboa, 2004). Many authors (Long & Thean, 2011) have criticised this trend, but according to Dunk (1995), due to the confidentiality and sensitivity of strategic data and performance, managers are reluctant to provide direct (objective) measures.

A potential disadvantage is that objective indicators are often difficult to obtain (Chandler & Hanks, 1993). Moreover, Crabtree and DeBusk (2008) argued that non-financial performance measures are more beneficial in foreseeing future performance and simplifying the organization's performance.

Therefore, it is essential that companies also be involved with non-financial performance measures to evaluate their intangible benefits (Kaplan & Norton, 2001). In the same direction, according to Wang, Chich-Jen, and Mei-Ling (2010), the measurements of performance should cover a broader range of performance measures

such as customer satisfaction and quality as non-financial indicators because there is no single performance indicator that reflects all aspects.

For those reasons, some researchers used numerous non-financial measures to gauge organizational performance. Hult et al. (2008) used the organizational innovation measure. Wu and Lu (2012) studied service quality. Organizational growth was adopted from the studies of Qrunfleh and Tarafdar (2014), Wu and Lu, (2012) and Rai, Patnayakuni, and Seth (2006). Grawe, Chen, and Daugherty (2009) adopted the overall competitive position whereas Phillips (1999) adopted the occupancy percentage, average room rate, growth in sales per room, number of successful new and services/products introduced. The evaluation of organizational performance was based on indicators of effort, satisfaction and effectiveness (Ejere & Abasilim, 2013).

However, the two categories of performance measures have their inherent merits and demerits (Oyewobi et al., 2016). Considering the limitations of each type of criterion and the multidimensional nature of performance, the use of multiple performances may provide a more accurate estimate of the truth (Hoogh et al., 2004).

Studies have adopted different approaches to measuring organizational performance (financial and non-financial) measures (Schiuma & Lerro, 2008; Garnett et al., 2008; Green & Inman, 2007). Tippins and Sohi (2003) suggested that organizational performance is measured in four dimensions: relative profitability, return on investment, customer retention, and total sales growth. However, Ho (2008) focused on financial performance and market performance and adopted these two factors for the dimension of organizational performance.

Within this context, the Balanced Scorecard (BSC) approach can be used for the multidimensional analysis of performance measurement (Dinçer et al., 2017). To recognise the need to go beyond financial indexes, Kaplan and Norton (1992) proposed that BSC approach be used so that managers could track both financial and operational metrics to measure organizational performance. Kaplan and Norton first introduced the BSC concept at the Harvard Business Review (Kaplan & Norton, 1992), where the greater strength of BSC compared to other frameworks lies in its ability to link the performance between different classes of business performance, financial and non-financial, internal and external (Valmohammadi & Ahmadi, 2015; Hou, 2016).

Kaplan & Norton (2007) suggested a framework that enables managers to consider four performance criteria to deal with activities such as innovation and continuous improvement required by the current competitive environment. BSC follows all key indicators of the organization's strategy that enable officials to get a quick and comprehensive presentation of business from four important perspectives. BSC does involve not only financial measures with the results of actions already taken, but also operational measures related to customer orientation, organizational effectiveness, learning and growth that are engines of future financial performance.

Most researchers who used the balanced performance card model adopted the four perspectives of the model, as shown in Table 2.7.

Table 2.7

Four Perspectives of BSC

No.	Perspectives Authors	Financial	Customer	Internal Process	Learning & Growth
1	(Mehralian et al., 2017)	√	√	√	√
2	(Llach, et al., 2017)	√	√	√	√
3	(Dinçer et al., 2017)	√	√	√	√
4	(Nazarian, Soares, & Benjamin, 2017)	√	√	√	√
5	(Hou, 2016)	√	√	√	√
6	(Mehralian, et al., 2016)	√	√	√	√
7	(Al-Dhaafri & Al-Swidi, 2016)	√	√	√	√
8	(Yaghoobi & Haddadi, 2016)	√	√	√	√
9	(Argyropoulou, et al., 2015)	√	√	×	√
10	(Salehzadeh, et al., 2015)	√	√	√	√
11	(Valmohammadi & Ahmadi, 2015)	√	√	√	√
12	(Asiaei, 2014)	√	√	√	√
13	(Mafini & Pooe, 2013)	√	√	√	√
14	(Alhyari, et al., 2013)	√	√	√	√
15	(Hou, 2013)	√	√	√	√
16	(Rajesh, et al., 2012)	√	√	√	√
17	(Wu & Chang, 2012)	√	√	√	√
18	(Wu & Lu, 2012)	√	√	√	√
19	(Krathu, et al., 2012)	√	√	√	√
20	(Chen & Liang, 2011)	√	√	√	√
21	(Uwizeyemungu & Raymond, 2010)	√	√	√	√
22	(Iselin, et al., 2010)	√	√	√	√
23	(Hubbard, 2009)	√	√	√	√
24	(Blackmon, 2008)	√	√	√	√

25	(Iselin, et al., 2008)	√	√	√	√
26	(Christesen, 2008)	√	√	√	√
27	(Fuentes, 2008)	√	√	√	√
28	(Velcu, 2007)	√	√	√	√
29	(Kettunen & Kantola, 2005)	√	√	√	√
30	(Libby, et al., 2004)	√	√	√	√
31	(Laitinen, 2002)	√	√	√	√
32	(Hoque & James, 2000)	√	√	√	√
33	(Otley, 1999)	√	√	√	√
34	(Martinsons, et al., 1999)	√	√	√	√

The financial perspective highlights how the company appears to shareholders and how one finds many of the traditional financial measures. However, the historical accounting figures represent lagging measures of performance. In other words, the financial results cannot be managed directly, but as a result of performance in other areas. Thus, the scorecard complements the lagging measures of the financial perspective with leading measures of the other three perspectives, namely, those of the customer, internal business and learning and growth (Elbanna, 2012; Velcu, 2007).

According to Elbanna (2012), the four perspectives of BSC jointly provide an inclusive picture of performance as BSC is more than tactical or an operational measurement system. Innovative organizations are using the scorecard as a system of strategic management (Kaplan & Norton, 1996). Furthermore, it is used as an instrument to communicate and control the application of strategy (Valmohammadi & Servati, 2011; Malagueño et al., 2017). BSC is one of the administrative practices

most repeatedly used by large and small- and medium-sized organizations (Cooper, Ezzamel, & Qu, 2017). The four perspectives of BSC are described as follows:

a. Financial Perspective

The financial indicators involve traditional financial measures such as profitability, risk, and growth (Mehralian et al., 2017) since the main financial aim for organizations is to raise shareholder value. Organizations increase shareholder value through three requisite goals; productivity improvement, revenue growth and cost structure reduction (Kaplan & Norton, 2001).

Increase return on investment and increase return on the assets measure the productivity, whereas increase profit margins measure the revenue growth (Yeniyurt, 2003) to reduce operating costs and increase the use of materials/assets as a measure of the cost structure (Hoque & James, 2000).

b. Customer Perspective

The customer indicators require the relationship that a company was founded with its coveted clients such as market share and customer satisfaction (Mehralian et al., 2017). Therefore, many organizations today have turned into a customer-focused task. The essence of any business strategy is to display customer value, which describes the unique mix of product and service attributes, customer relationship, and organization imagery (Hou, 2013).

The value proposition is crucial because it assists a company to connect its internal processes, leading to improved results with its clients (Kaplan & Norton,

2001). Therefore, improving the quality and effectiveness of products is a measure of customer response time and service, and satisfaction is a measure of customer relationship (Hoque & James, 2000). Thus, the customer's perspective is to assist companies to focus on the external environment and enable them to understand, identify and confirm their client's needs (Kaplan & Norton, 1996).

c. Internal Process Perspective

The internal business process indicators focus on the techniques and practices used within the company to create value and how to develop these operations (Mehralian et al., 2017).

Once they have a clear picture of their financial and customer perspective, the company needs to limit how to deliver value to customers and improve productivity to reach their financial goals. The internal process perspective embodies important organizational activities that are located in the three main internal operations, namely the management process, the customer management process and the innovation process. In the operations management process, directors realise measures that show whether the company has attained operational excellence by improving the supply chain management internal process, used assets and capacity management. For the customer management process, directors are aware of measures that support the creation of customer value. For the innovation process, directors are aware of measures that support the development of new products or services (Kaplan & Norton, 2001).

d. Learning and Growth Perspective

Learning and growth indicators are interested in priorities to originate an enabling environment for organizational change, innovation and growth (Mehralian et al., 2017). The learning and growth perspective highlights aligning the company's intangible assets to its strategy (Hou, 2013).

This perspective includes three elements of intangible assets that are essential for achieving any strategy for human capital, information capital and organizational capital (Kaplan & Norton, 2001).

BSC does not mean "using more measures" but refers to putting together a set of strategically critical measures in a single report. In this way, it makes causal relationships transparent and keeps managers from sub-improvement by improving one action at the expense of others. To achieve a balance between the four dimensions of BSC, the organization must pay attention to all these dimensions (Hoque & James, 2000).

Based on the above, the researcher believes that there are interactive and interrelated linkages between the four perspectives, since the outputs of each perspective represent the inputs of the following perspective. Learning and growth increase the organization's ability to create a group of willing and able labour. Logically, this will increase the organization's ability to improve the performance of internal processes. This will turn, lead to a high degree of customer satisfaction, which is reflected in the form of improved financial performance, thereby improving

organizational performance. Therefore, for the aim of this thesis, the organizational performance was measured using the four BSC performance dimensions.

2.6 Theoretical Foundations of The Study

The viewpoint that sustains the association between MIS indicators and organizational performance with the mediating variable of TQM requires the theoretical framework of Resource-Based View (RBV), Technology Acceptance Model (TAM), and Diffusion of Innovation theory (DOI). All these are discussed below:

2.6.1 Resource-Based View

Penrose (1959) was the first person who originally introduced the RBV theory of originated in strategic management and microeconomics literature. This was followed by Teece (1982); Wernerfelt (1984); Rumelt (1984), who tried to realise the notion. The RBV addresses the fit between what ability organizations have and what opportunities it has to do (Russo & Fouts, 1997).

Resources are the basic building blocks to a firm's functioning and performance (Ngah, 2011). According to Barney (1991), only the resource or capacity has the potential to enable the company to reduce costs and/or respond to environmental opportunities and threats. It is valuable to the extent that the company is able to deploy such a resource or capacity effectively which is a competitive

advantage. However, the objective of a company is to guarantee it has access to and control of valuable resources by improving and securing all the pertinent resources either internally or externally. If an organization possesses crucial resources that have strategic value, it is better to keep the activity in-house. Conversely, if the strategic value of the targeted activities is low and there are no internal resources available to perform such activities, it is useful for the organization to outsource them. For sustainable competitive advantages, companies have to rely on a large number of external suppliers for parts, programmes, knowledge and sales, and in doing so have access to valuable resources and external capabilities (Langlois, 1990).
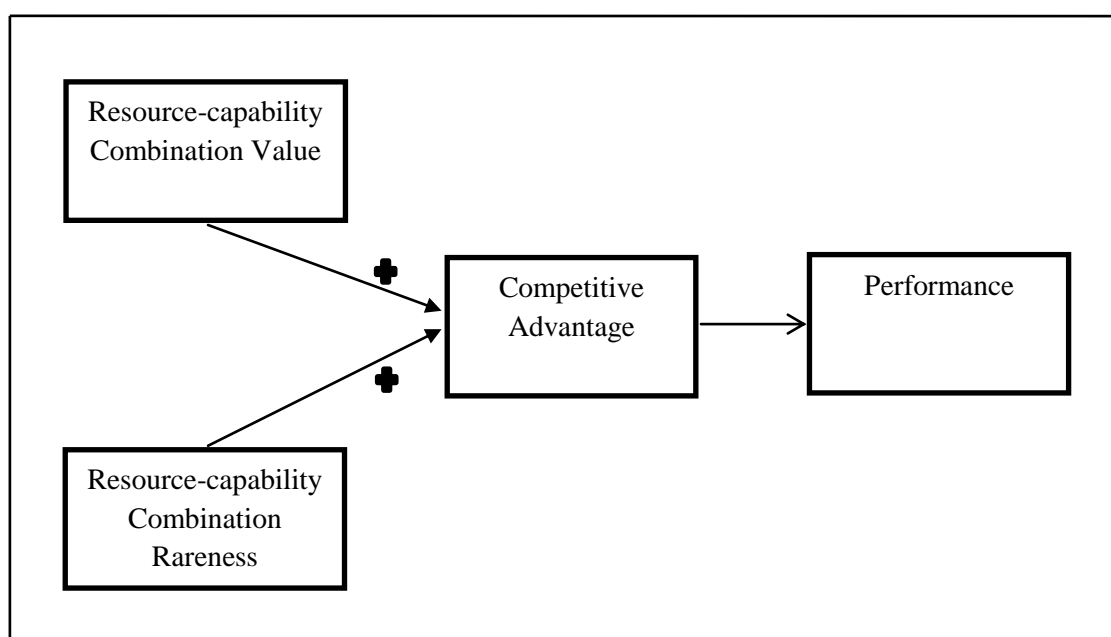
Figure 2.2. Relations Between Resources and Performance. Adapted from S.L. Newbert, 2008.

The RBV argued that companies have resources that enable companies to achieve competitive advantage that will lead to superior performance over the long term. Precious and scarce resources can lead to the creation of a competitive

advantage. This feature can be maintained over longer periods of time to the extent that the company is able to protect against resource limitation, transportation or substitution (Frawley & Fahy, 2006). Treating these resources strategically will give the firm longer advantage than competitors (Takeuchi, Lepak, Wang, & Takeuchi, 2007; Newbert, 2008). Eventually, an organization's resources will lead to capabilities and capabilities will influence the organizational performance (Barney, 1991; Wernerfelt, 1984).

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│   │              │      │              │      │   Superior   │    │
│   │   Valuable   │  ⇒   │  Distinctive │  ⇒   │ Organizational│   │
│   │   Resources  │      │  Capabilities│      │  Performance │    │
│   │              │      │              │      │              │    │
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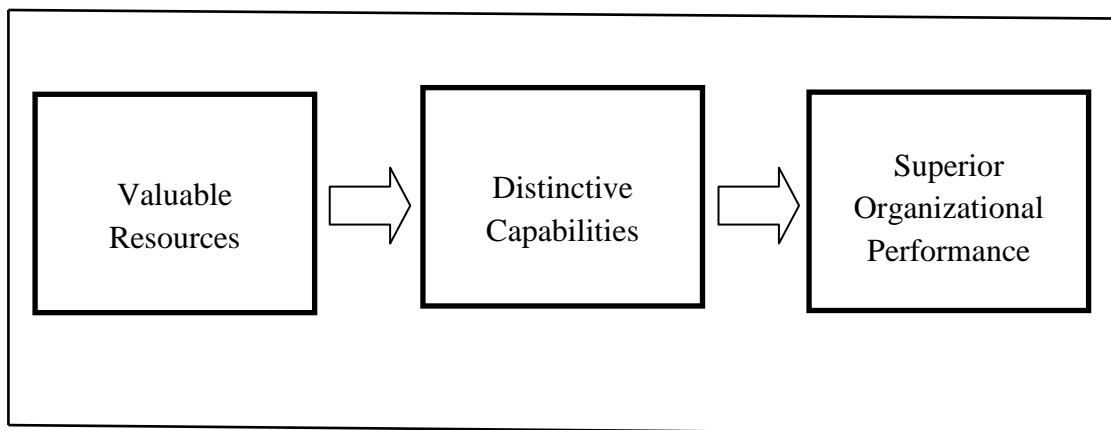
Figure 2.3. Basic Illustration of RBV Theory. Adapted from J.Barney, 1991.

Researchers in information systems have identified many resources of information systems as potential sources of competitive advantage and performance (Gu & Jung, 2013). According to Mata, Fuerst, and Barney (1995), four attributes were identified as sources: access to capital, proprietary technology, technical and managerial skills. In addition, (Ross, Beath, & Goodhue, 1996) identified three IT assets: human resources (technical skills, business understanding, and problem solving orientation), technology resources (sharable technical platforms and databases), and relationship resources (shared risk and responsibility). In a similar

context, Bharadwaj (2000), considered the resources of information systems as human resources, including technical information systems skills and managerial information systems skills, IT infrastructure, and information systems -enabled intangibles.
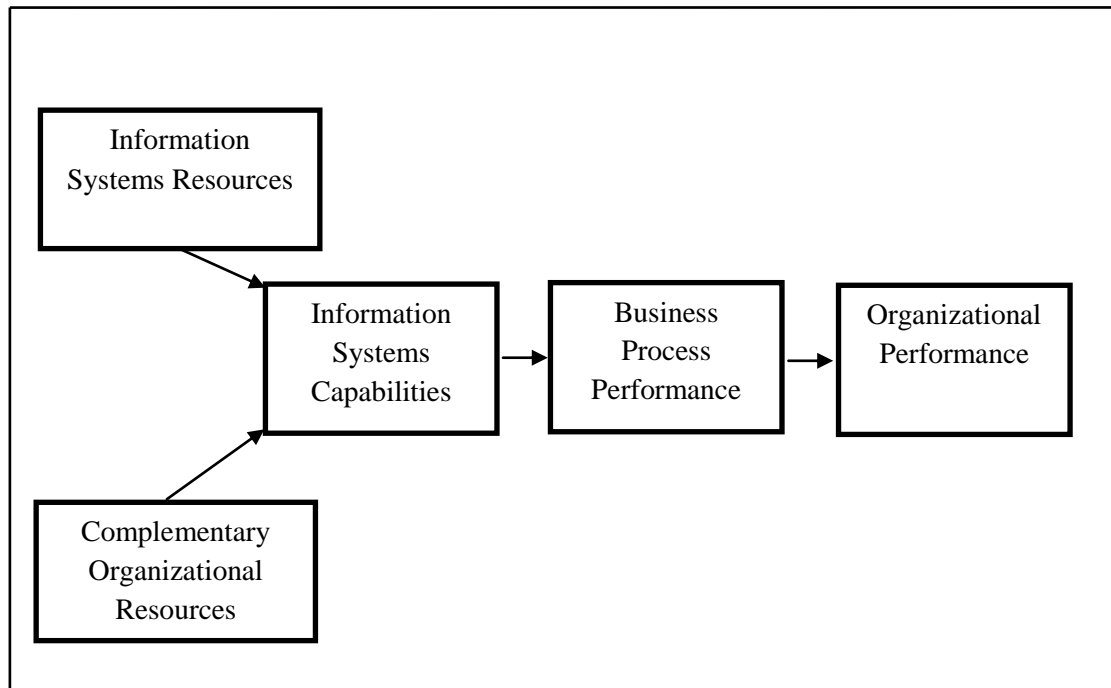
Figure 2.4. Relations Between RBV and Organizational Performance. Adapted from J.Gu & H.Jung, 2013.

Information systems resources may take a lot of dynamic capacity attributes and may be helpful for companies operating in a rapidly changing environment. Information resources may not lead the company directly to the position of a highly sustainable competitive advantage, but it may be crucial to the company's ability to compete in the long run in unstable environments if it helps them improve, add, integrate and release over time (Wade & Hulland, 2004). Resources such as adequate funding and competent human resources are critical to the effectiveness of market entry strategy management practices in a rapidly changing environment (Wade & Hulland, 2004) Also, the dynamic capacity of resource management activities and

mechanisms to create value enables firms to manage their activities to improve performance.

According to Salleh, Jusoh, and Isa (2010), support for the development of information systems can be considered as a valuable resource that enables the company to improve its efficiency and effectiveness. With regard to the evolution of information systems, Ravichandran and Lertwongsatien (2005), suggested a model that links the resources of information systems, information system capabilities and information systems support to core competencies and organization performance by using the RBV perspective. In the same context, studies by Bharadwaj (2000), and Santhanam and Hartono (2003), found that organizations with high information systems tend to outperform low-level organizations with the ability of information systems to perform a variety of organization performance. Their study has made references that the organization performance explains the range to which information systems are used and the company's ability to use information systems resources to support its core organizations.

Based on the above, the researcher believes that within the context of resources, MIS and TQM can be considered as unique intangible assets which the organization possess that has an influence on the organizational performance. Thus, the MIS and TQM represent the resource capacity of the organization and are considered a competitive advantage which in turn leads to the strengthening of organizational performance.

2.6.2 Technology Acceptance Model

The TAM was developed by Davis (1985), Figure 2.3. which was founded on the theory of reasoned action (TRA), to understand the causal relationships between users internal beliefs, attitudes, and also intentions to foresee and clarify the acceptance of computer technology (Davis, Bagozzi, & Warshaw, 1989). Under TAM, there are two types of determinants, which involves the perceived ease of use and perceived benefits (Chen, Li, & Li, 2011).

TAM assumes that the user's actual use behaviour (actual use) is directly affected by the intentional intent (use intention). In contrast, behavioural intent is determined by both the user's position and his perception of its utility. The user's position is highly influenced by two main beliefs, understandable utility and ease of understanding of use, and both these beliefs act as intermediaries between external variables (e.g. design features, prior usage and experience, computer self-efficacy, and confidence in technology) and intention to use. Moreover, TAM theorises that (perceived ease of use) indirectly impacts (intention to use) through (perceived usefulness) (Davis, 1989; Davis et al., 1989; Venkatesh & Davis, 2000).
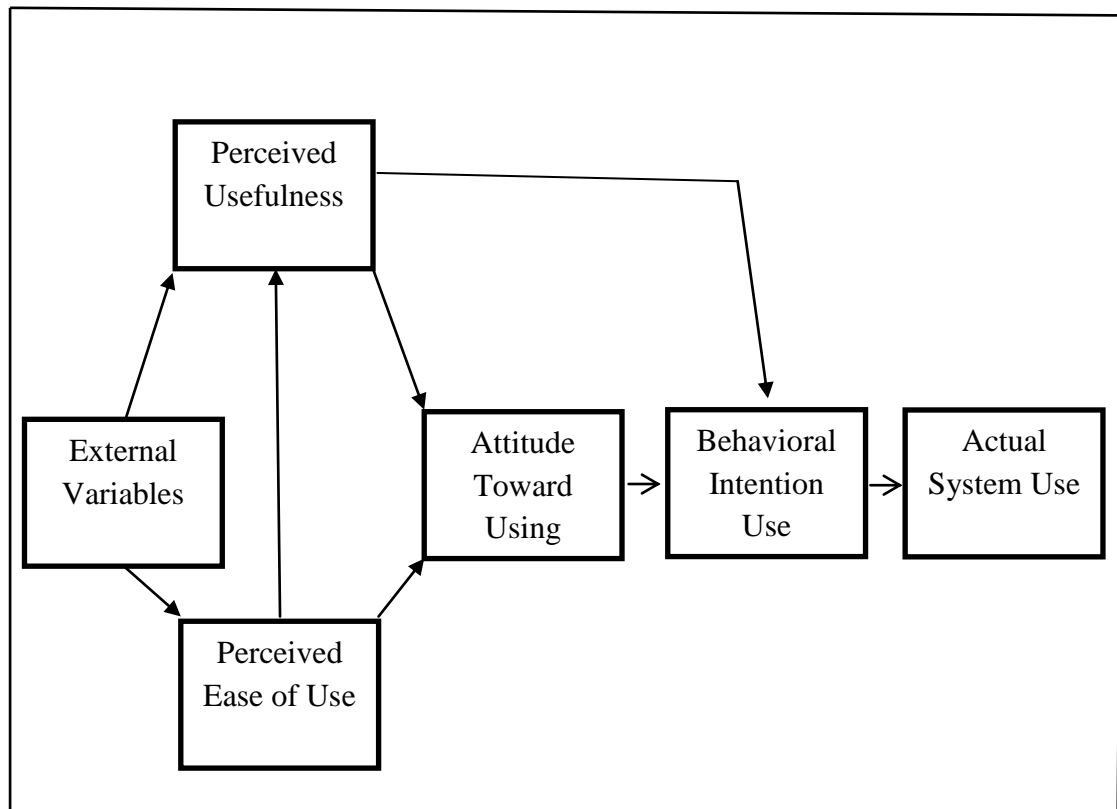
Figure.2.5. Technology Acceptance Model. F.D. Davis, R.P. Bagozzi, & R.P. Warshaw, 1989.

Information systems research has always studied how and why employees adopt new IT. Within this broad field of inquiry, there have been several models of research (Franco & Garcia, 2017). One stream of research focuses on individuals' acceptance of technology (Compeau & Higgins, 1995). Other models have focused on application success at the organizational level (Leonard-Barton & Deschamps, 1988). This model is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). TAM aims to predict the behaviour of users in terms of acceptance of technology, and determine the modifications that must be made in the technology so that users can adopt them (Venkatesh & Davis, 2000). Therefore, this model proposes that technology

acceptance is determined by user awareness of its utility and ease of use (Franco & Garcia, 2017).

The literature on the factors of IT acceptance is quite extensive (Chen, 2015). TAM is one of the most dependable frameworks in accepting user technology because of its strength, simplicity and pertinence in explaining and foreseeing the characteristics that impact the user's adoption behaviour towards new technologies (Lu, Yu, Liu, & Yao, 2003; Marangunić & Granić, 2015; Rauniar, Rawski, Yang, & Johnson, 2014; Venkatesh & Davis, 2000). Also, TAM was evolved over the years, and a lot of researchers experimented with adding new variables to the model in an attempt to increase its explanatory power (Gikang, 2016). Therefore, this theory is relevant because it explains why companies accept and adopt technology. This is because of perceived utility and perceived ease of technology use.

Based on the above, the researcher believes that the use of technology, including MIS, requires, to comply with TAM's, two basic requirements perceivable utility and perceived ease of use. Therefore, in order to achieve these two conditions, the organization must have a culture that promotes organizational learning and staff participation, which is provided by TQM. In conclusion, the existence of a comprehensive re-management is an important factor in expanding the use of MIS thus improving organizational performance.

2.6.3 Diffusion of Innovation Theory

The DOI is a theory that spreads innovation, ideas and technology through culture or cultures (Rogers, 2003). DOI states that there are a lot of qualities in various people that make them want to accept or not to accept an innovation. Also, there are many kinds of innovations that can make people easily accept or resist them (Mung'ala, 2014).

DOI theory was constructed to explain how and why innovations spread among a population. The theory appears to be aligned with neoclassical economics and modernisation theory, which presents universal explanations for decision-making based upon the assumption that human beings behave as "rational actors" and thus predictably pursue self-interest. In summary, new ideas are first adopted by a small minority of innovators. The ideas are, then, picked-up by a larger minority known as early adopters, followed by the early majority, late majority, and finally laggards. The adoption rate is often expressed according to the standard s-curve which begins slowly, picks up speed, and tapers off as the laggards finally adopt the ideas (Matthews, 2017).

Rogers (1995), defined diffusion as "the process by which an innovation is communicated through certain channels over time among the members of a social society". An innovation is "an idea, practice, or object perceived as new by an individual or other unit of adoption" (Rogers, 2003). Innovation can happen, in three broad areas; products, processes, and firms, and is ''an idea, product or process, system or device that is perceived to be new to an individual, a group of people or

firms, an industrial sector, or a society as a whole'' (Rogers, 1995). Organizational

innovation collects the improvement and application of new ideas, behaviours,

systems, products, or technology (Damanpour, (1991).
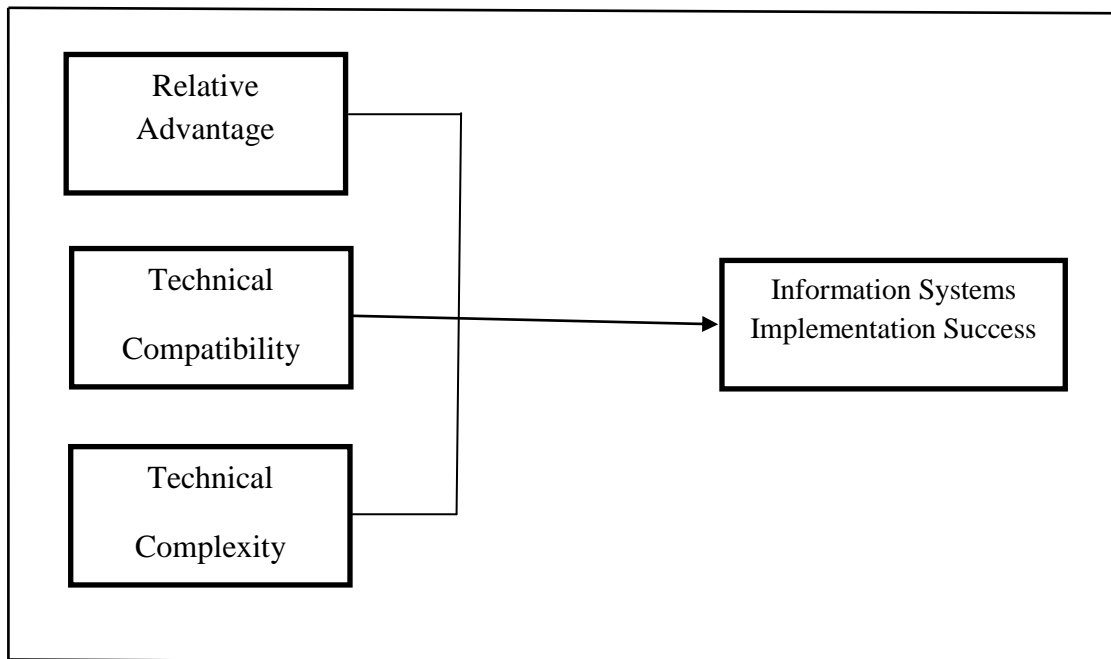
Figure 2.6. The DOI Theory. Adapted from R.Cooper & R.Zmud, 1990.

In competitive markets, organizations must increase their knowledge to adapt

to new products and technology, and continuously distribute this knowledge to all

staffs. Based on a firm's internal factors, the nature of innovation can include

technical, product, and process innovation. These internal factors involve knowledge

and skill resources, physical and management systems, and values and rules. The

external factors involve customers, competitors, statutes, and technology (Hung, Lien,

Yang, Wu, & Kuo, 2011). The four key elements of diffusion of innovation as

explained by (Rogers, 1983) are:

a. The Innovation

An innovation is an idea, practice, or object that is perceived as new by a person or other unit of adoption. It matters little, so far as human behaviour is concerned, whether or not an idea is "objectively" new as measured by over time since its first use or discovery. The perceived newness of the idea for the individual determines his or her reaction to it. If the idea seems new to the individual, it is an innovation.

b. Communication Channels

A communication is a process in which participants establish and share information with one another in order to reach a mutual understanding.

c. Time

Time is a significant factor in the diffusion process. Actually, most other behavioural science research is immortal in the sense that the time dimension is simply ignored. Time is a clear aspect of any communication process, but most (non-diffusion) communication research does not deal with it explicitly.

d. A Social System

The social system is defined as a set of interdependent units that participate in common problem solving to achieve a common objective. Members or units of the social system may be individuals, informal groups, firms and/or subsystems.

The five most significant characteristics of innovation are: relative advantage, compatibility, complexity, trialability, and observability (Almalki, 2014). Table 2.8 shows the definitions of these five attributes of innovation taken from Rogers (2003).

Table 2.8

Definitions of The Five Attributes of Innovation

Innovation Attribute	Definition
Relative advantage	The degree to which an innovation is perceived to be better than the idea it supersedes.
Compatibility	The degree to which an innovation is being consistent with existing values, past experiences and needs of potential adopters.
Complexity	The degree to which an innovation is perceived as difficult to understand and use.
Trialability	The degree to which an innovation may be experimented with on a limited basis.
Observability	The degree to which the results of an innovation are visible to others.

Source: Adapted from E.M. Rogers, 2003.

As one of the pure theories of MIS, information systems permeate the theory of success in the discipline literature. However, the use of information systems theory of success beyond the scope of information systems is limited (Hazen et al., 2014). Therefore, DOI theory is a common model used in information systems research to explain the users' use of new technologies (Gikang, 2016).

According to Nilashi et al (2016), DOI primarily focuses on the impact of innovation characteristics on potential adopters (organizations and individuals). Therefore, DOI theory is pertinent because it explains the cause why firms adopt technical innovations. One of the causes why firms adopt technical innovations is a related feature and improved performance (Gikang, 2016). This means that oil firms that adopt technological innovations have a relatively better competitive advantage than those who do not as they increase efficiency and transparency in the way their activities are carried out.

Based on what was presented, the researcher believes that MIS is considered as a kind of modern and innovative technology. In addition, TQM represents a managerial philosophy based on the emergence of organizational culture, participation and collective responsibility, which generates a positive organizational climate that makes organizations capable of overcoming organizational conflicts within them thus moving towards achieving their goals. Therefore, according to the DOI theory, the application of TQM is an important factor when spreading the use of information systems in the organization and thus improving organizational performance.

In the same context, MIS and TQM can be considered the main driver of the third and fourth industrial revolution. According to Bahrin, Othman, Azli, and Talib (2016), The third revolution takes place in the digital automation of production by means of electronics and IT system. Today, the industrial landscape is again being transformed to the fourth stage.

Industry 4.0 is an industry that combines automation technology with cyber technology. It is a trend of data automation and exchange in manufacturing technology. In this era, the industry began to touch the virtual world, in the form of human, machine, and data connectivity, everything was everywhere or known as the Internet of Things (Lase, 2019). Industry 4.0 ultimately aims to construct an open, smart manufacturing platform for industrial-networked information applications (Willliam, 2014). Industry 4.0 could be utilized as a key enabler for TQM especially by integrating its techniques with the TQM best practices (Sader, Husti, & Daróczi, 2019).

The above discussion provides sufficient support for the use of RBV, TAM and DOI as fundamental theories of this study. Especially in the context of the Iraqi oil sector where Missan Oil Company is suffering from the issues of low productivity and low levels of employee skills and the weak use of information systems. Thus, weakening the organizational performance. This means that the current development in Missan Oil Company required the efficient use of resources, especially MIS, which needs a framework that encourages learning, participation and collective responsibility which is provided by TQM. Thus, the theories of RBV, TAM and DOI are the theories most relevant to this study.

2.7 Areas of Benefit From The Literature Review

The areas that have benefited from this study can be summarised from the above studies which are related to the study variables as follows:

1. Identification of some references, sources and research that the researcher was unable to know before.

2. Contribute to the construction of some elements of the theoretical framework of this study.

3. Contribute to the formulation and design of the objectives of the study plan.

4. Represents an intellectual accumulation that allowed the researcher to start framing the dimensions related to this study.

5. Formulation of the question or clauses related to the research variables.

6. To examine the methods of analysis, reliability, validity, and internal consistency used in these studies, through which it was possible to identify the methods most appropriate to the variables of the current study.

2.8 Relationship Between MIS, TQM, and Organizational Performance

This study aims to verify the relationship between MIS and organizational performance as well as the mediating role of TQM at Missan Oil Company. Because there is no study combining these three variables combined (within the limits of the researcher's knowledge), the relationship between each of the two variables was clarified.

2.8.1 Relationship Between MIS and Organizational Performance

MIS is one of the most significant accomplishments in the area of managerial business, which seeks to supply reliable, exact, relevant and complete information to directors towards increasing the organizational performance of firms (Al-Mamary, et al, 2014).

MIS assists the functioning and monitoring of a company. Furthermore, it depicts the elements and resources to guarantee the valid functioning of a firm (Munirat, et al, 2014).

According to O'Brien (1998), an information system is important for the control of performance. It should provide feedback that can be monitored and evaluated to determine if the system is achieving the established or set standards. A good system is one that is adjustable so that appropriate information is produced and provided to end users. Individual performance measures should be relevant to the organization's objectives. People and systems should work together to ensure that desirable outcomes are achieved. Therefore, information systems form part of an effective performance management (Osodo & Jemaiyo, 2015).

Evidence from many case studies have suggested that IT increases productivity and performance (Byrd & Marshall, 1997). The study by Kehinde and Yusuf (2012), investigated the role of MIS as a catalyst to organizational performance in the 21st century. A structured questionnaire was distributed to 60 selected employees of three selected Banks in Nigeria including the Intercontinental Bank for purpose of analysing the collected data, using the descriptive and regression method of statistical analysis. The outcome of MIS is very important to an organization because no organization can survive, expand and attain significant development without information particularly in the banking sectors in the 21st Century.

The study by Al-Mamary, Shamsuddin, and Aziati (2015), tried to focus intensely on the factors that led to the successful adoption of MIS in Yemeni firms. This study examines the relationship between MIS which involves technological factors (system quality, information quality, and service quality), organizational factors (top management support, and user training), and people factors (computer

self-efficacy, and user experience) with organizational performance at Sabafon Company in Yemen, focusing on people who are constantly related with MIS in their business. This study revealed that there is a significantly linked relationship between system quality, information quality, service quality, top management support, user training, computer self-efficacy, and user experience with organizational performance.

The study by Ndlovu (2015), depicted the term of MIS in measuring organizational performance in government organizations. A case study method was applied to examine the study problem. Face-to-face interviews and self-administered questionnaires were utilised to gather the data. The study concluded that the function of MIS in measuring organizational performance was limited in the KwaZulu-Natal Department of Arts & Culture. The major reason for this is because the firm does not have an integrated MIS or adequate capacity to improve and run such a system. Therefore, this study recommended that there is a necessity to build adequate capacity in order to fully implement MIS.

The study by Khresat (2015), examined the relationship between MIS that involves (software, devices, and databases) and organizational performance in Jordan. The population of the study covered all telecommunication organizations in the Amman city. The study found that the staffs in Jordanian telecommunication companies have positive behaviour towards MIS. The outcome of the study detected that there is a statistically important relationship between MIS and organizational performance in telecommunication firms in Jordan.

The study by Agu et al (2017), determined that there is an effect of MIS on organizational performance in the 7up Bottling company. The study used questionnaire and the sample size was 297 employees. The study found that data are of no value unless utilised by the proper management personnel. Without a properly structured MIS, raw data are relatively useless. Also, there is a low level of appreciation and investment in MIS by 7up Bottling Company which has led to a decrease in the effect of MIS on the performance of the company. Therefore the study recommended that organizations should appreciate and invest seriously in MIS, viz adequate training and retraining programmers in MIS.

Thus, it can be concluded from the above discussion that: H1, H2, H3, H4, H5, and H6: MIS indicators (system quality, information quality, service quality, use the system, user satisfaction, and net benefits) are positively related to organizational performance in the company under study.

2.8.2 Relationship Between MIS and TQM

The philosophy of TQM principle is that continuous improvement leads to a continuous flow of change requesting for information systems (Spencer & Duclos, 1998). The factors that make the application of TQM successful involve management capability of quality information, production rationalisation, and automation. Therefore, organizations have increasingly found that IT and information systems are the main success factors of TQM. Thus, through the application of MIS, organizations should be able to implement TQM better (Lin, et al, 2012).

In actual fact, TQM and information systems have common goals. In most companies, some of the basic aims of TQM are increasing competitiveness and effectiveness by improving product quality and processing to fulfill both the needs of the consumer and the firm. Whereas the goals of information systems are growing production, developing quality, improving services, declining costs, and increasing the firm's competitiveness (Fok, et al, 2001).

Many researchers have addressed the relationship between MIS and TQM, where the study of Fok et al (2001), investigated the relationships between TQM and information systems improvement. Specifically, they consider whether organizations which have more fully adopted TQM will be various in their methods to information systems improvement. The results suggest that where TQM is adopted more fully, there will be an important effect on four areas of information systems improvement: system objectives; system design philosophy/concepts; assumptions made by information systems professionals about system users and user involvement in the system development. Also, the study report shows evidence that both TQM and IT may entail similar organization cultures.

The study by Dewhurst, et al (2003), investigated the relationship between IT and TQM through an interview survey of 14 organizations based in Spain. In this study, nine dimensions of TQM are used to support top management support, customer relationship, supplier relationship, workforce management, employee attitudes and behavior, product design process, process flow management, quality data and reporting, and the role of the quality department). The study concluded that

the use of IT has an effect on the dimensions of TQM and the implementation of TQM, each of which will have an impact on the organization's performance.

The study by Siddiqui and Rahman (2006), examined the increasing awareness for benefits by understanding through a synergy between information systems and TQM, and the readiness of information systems directors in India for TQM. Data collection was done by mail survey questionnaires. A total of 300 Indian firms were selected for the survey as they are supposed to use TQM in their information systems unit. The study concluded that there is a dual impact relationship between TQM and information systems. The implementation of TQM entails the availability of the information provided by the information systems. On the other hand, the implementation of TQM develops the work of information systems.

The study by Siam et al (2012), aims is to recognise the scope to which IT has been utilised to support TQM in order to recognise the role of IT in implementation TQM at firms of Sohar industrial estate in Oman. The main focus of this study was on how IT extends assistance and supports to TQM operations rather than on TQM performance. The outcomes of the study specified that the use of IT is not the same between the various TQM dimensions (leadership, strategic planning process, output quality assurance, supplier quality assurance, important innovations, information and analysis, human resources utilisation, customer satisfaction, and quality results). The largest level of IT support was utilised in information and analysis, output quality reliance and important innovation. While the lowest level of IT support was utilised in quality outcomes and supplier quality assurance. The role of IT is, therefore, used in

adapting the working operations to improving product quality and the strengthening of productivity.

The study by Almashaqba (2013), tried to examine the effect of MIS on some of the chosen factors of TQM, namely performance, creditability, and teamwork. The significance of the research comes from knowing the relations between the modern administrative concepts and the new developed technology in MIS and knowing the effect of this technology on TQM. Outcomes showed a statistical effect of MIS on the institutional performance, a statistical effect of MIS on reliability and no statistical effect of MIS on the team work. The research recommended a continuous study of the relationship between the MIS and TQM.

Thus, it can be concluded from the above discussion that: H7, H8, H9, H10, H11, and H12: MIS indicators (system quality, information quality, service quality, use the system, user satisfaction, and net benefits) are positively related to TQM in the company under study.

2.8.3 Relationship Between TQM and Organizational Performance

TQM helps to manage companies and organizations to develop their whole efficiency and performance in order to attain world-class position for the past years (Yusof & Aspinwall, 2001). According to Choi and Eboch (1998), TQM is described as a collective, interlinked system of quality practices that is associated with organizational performance.

Leading quality researchers, such as Deming, Crosby, and Juran, support the positive association between quality implementation and organizational performance (Shafiq, et al, 2017). In the same direction, many researchers claimed that TQM is considered as an important quality improvement and performance improvement tool (Flynn, et al, 1995; Powell, 1995; Forker, et al, 1997; Hendricks & Singhal, 1997; Terziovski & Samson, 1999; Samson & Terziovski, 1999; Dow, et al, 1999; Reed, Lemak, & Mero, 2000; Terziovski & Samson, 2000; Rahman, 2001; Brah, et al, 2002; Sousa & Voss, 2002; Rad, 2005; Sila, 2007; Claver-Cortés, et al, 2008; Kumar, et al, 2009; Bhat & Rajashekhar, 2009; Kumar, et al, 2009; Jayaram, et al, 2010; Corredor & Goñi, 2011; Hung, Lien, Yang, Wu, & Kuo, 2011; Saeed et al., 2013; Joiner, 2014; Ng, et al, 2014; Mehralian, 2017).

The linkage between TQM and organizational performance has also been investigated by many researchers (Ajay & Dhall, 2016). Mmalik, et al (2010), in his study explored the impact of TQM practices (top management commitment, customer focus, supplier relationships, employee involvement and empowerment, work environment and benchmarking) on organizational performance (non-financial performance) of SMEs. The sample size comprised of 60 SMEs (both ISO-9000 certified and non ISO certified SMEs) from three renowned industrial cities of Punjab province. Six determinants of TQM practices were identified and its impact was measured on performance of SMEs. The study established that TQM practices are critical factors and have a positive impact on the performance of SMEs.

The study by Nekoueizadeh and Esmaeili (2013), explored the impact of TQM practices (employee relations, leadership, customer relations, product/process

management) on the organizational performance (human resources results, financial performance, non-financial performance) of the telecommunication companies of Iran. To analyse the complex relationship between the variables, SEM methodology was employed. For the study, 330 questionnaires were randomly scattered among the sample members, analysis of the data supported a strong and positive relationship between the TQM practices and organization performance.

The study by Sweis, et al (2016), examined the relationship between the application of TQM programmes (training, teamwork, senior management commitment, continuous improvement, customer satisfaction), and organizational performance. The questionnaire is used to collect data from a sample of administrative staff at major Jordanian hospitals. The study revealed that there is a positive relationship between TQM practices and organizational performance, and organizational performance is often influenced by higher management. Also, the study found that organizational performance improves the presence of quality management practices.

The study by Mehralian, et al (2017), examined the relationship between the application of TQM and organizational performance, using BSC approach (financial perspective, customer perspective, internal process perspective, and learning and growth perspective). A questionnaire was designed and distributed to the top 30 pharmaceutical distribution firms in Iran. SEM was utilised to assess the measurement model by using the data collected from the 933 completed questionnaires. The study showed that the application of TQM can positively and significantly affect BSC and its four perspectives.

The study by Shafiq et al (2017), discussed the impact of TQM practices (leadership, strategy, partnership and resources, process, and people) on organizational performance (financial results and non-financial results). The study provides empirical evidence from a developing country in South Asia. Data were collected from member companies of all the Pakistan Textile Industries Association using a questionnaire. The questionnaires were sent to 210 textile companies and the respondents were managers of quality or production. The study indicated that TQM has a very positive impact on organizational performance. These results also support the argument of divergence, which suggests that TQM's positive impact on organizational performance is not limited to firms in developed countries, but can also be achieved equally in other parts of the world.

Thus, it can be concluded from the above discussion that: H13: TQM is positively related to organizational performance in the company under study.

2.8.4 Mediating Role of TQM

Previously, a large number of studies have been conducted to test the direct impact of MIS on organizational performance. However, the said impact remains ambiguous and needs further clarification (Kroll, 2015). In other words, some other variables should be considered to detect the mechanism by which this impact can be better explained. This is why many researchers have inspired future researchers to focus more on the subject and try to engage new variables that may affect the affiliation in a positive and significant way (Azadeh, Salehi, & Salehi, 2016). In this regard, TQM

has been linked and studied in such a way to demonstrate well the impact of the MIS on organizational performance. Through the use of TQM concepts, MIS may have the ability to achieve predefined goals and improve performance.

TQM focuses on some significant domains such as leadership, continuous improvement, innovation, customer focus, strategic planning, benchmarking, service design, etc. By implementing these techniques and practices in a company can help to achieve the required organizational performance. Logically, TQM can benefit firms because of the elements of success (Shafiq et al., 2017).

The researcher did not find any research that deals with the mediating role of TQM between MIS and organizational performance. However, many researchers have addressed the mediating role of TQM. The study by Prajogo and Sohal (2006b), investigated the fit of TQM practices in mediating the relationship between the organizational strategy and organizational performance. The empirical data for this study were drawn from a survey of 194 middle/senior managers of Australian companies. The analysis was done using SEM technique by examining two competing models representing full and partial mediation. The results indicated that TQM is closely related to the differentiation strategy and is only partially mediated by the relationship between the differentiation strategy and three measures of performance (product quality, product innovation, and process innovation). This means that TQM needs to be complemented by other resources to enable the strategy to be more effective by achieving a high level of performance, especially innovation.

The principal objective of the study by Demirbag, Koh, et al (2006), is to explore the effect of market orientation and the application of TQM on the organizational performance of small and medium enterprises. A model was suggested to connect the market orientation and TQM constructs to the organizational performance construct. Exploratory and confirmatory factor analyses empirically verified and validated the underlying dimensions of market orientation, TQM and organizational performance. SEM was employed to test the model drawing on a sample of 141 small and medium enterprises operating in the Turkish textile industry. Although data analysis shows that market orientation has a strong and positive effect on the scope of TQM application, nevertheless it has no significant effect on organizational performance. Likewise, a strong and positive relationship was noted between the level of TQM application and organizational performance. It has also been found that the market orientation has a positive and significant effect on organizational performance through only the mediating role of TQM application.

The purpose of the study by Elham et al (2014), was to examine whether TQM mediates between organizational citizenship behaviours and the success of enterprise resource planning (ERP) system. The data were collected using a questionnaire from the subordinates of steel smelting leaders in Iran using 102 questionnaires which were used to test the submitted model. The study found there is a relationship between organizational citizenship behaviours and ERP success and the role of TQM mediation in this model. Based on the results of this study, directors trying to implement successfully the ERP systems can review their evaluation systems through TQM in order to recognise and reward staffs who have a positive effect on organizational citizenship behaviours.

The study by Al-Dhaafri et al (2016), examined the relationship between enterprise resource planning (ERP) and organizational performance (which was measured using BSC) through investigating the mediating impact of TQM and organizational excellence and the moderating impact of entrepreneurial organizational culture. A survey questionnaire was utilised to collect data from Dubai Police stations. Of the number of questionnaires distributed, only 320 completed and usable questionnaires were returned. The completed questionnaires were used for analysis by applying an employed partial approach to the SEM methodology. The findings showed a positive and significant linkage between the ERP system organizational excellence, TQM, and organizational performance. Moreover, TQM was found to have partially mediated the effect of ERP on organizational performance, where organizational excellence was found to have completely mediated the impact on the same relationship.

The study by Mehralian et al (2016), examined how the relationship between corporate social responsibility and TQM impacted the organizational performance measured by BSC. The results of the analysis, utilising SEM on 933 full questionnaires sent to the pharmaceutical firms in Iran, propose that social responsibility is significantly associated with the integration of this responsibility into quality management programmes. Also, TQM has a significant and positive impact on organizational performance.

Therefore, the hypotheses regarding the suggested mediation impacts of TQM in the empirical test were introduced as follows: H14, H15, H16, H17, H18 and H19. TQM mediates the relationship between MIS indicators (system quality, information

quality, service quality, use the system, user satisfaction, and net benefits) and organizational performance.

2.9 Summary

The second chapter reviewed the different theories that dissected the independent, mediating and dependent variables. The reviewed theories are evaluated concerning particular variables. This chapter explored the concept of the independent, mediating and the dependent variables by analysing their relationships. Moreover, an empirical review was conducted in which studies were reviewed in line with the research criteria, title, scope, and methodology. It is from such criticism that the study gap was specified. The following chapter will explain the methodology of the research used to investigate the proposed hypotheses.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter introduces the research techniques and concepts used to find the objectives of the study, and ultimately establish the relationship between the independent, mediating and the dependent variables. Chapter Three starts with the research design, which shows the data collection process and schedule, instrument (questionnaire) development and its operations, detailed items, pilot testing, and reliability testing. The data analysis shows the statistical tools used to analyse the variables and their relationships.

3.2 Research Philosophy

Research philosophy or paradigm is based on the way the researchers think of the development of knowledge (Saunders, Lewis, & Thornhill, 2009). Defining the paradigm or perception for this research is significant because it guides and sets the basis for the research process (Saunders et al., 2009).

As evident from the theoretical model, the hypotheses have been formulated by the researcher to measure the relationship between MIS and organizational performance through TQM. Using the positivist philosophy/paradigm, quantitative analytical techniques are found to be the most relevant philosophy for this study.

Keeping in view the philosophy and main objectives of the study, the next step is to select an appropriate approach. According to Saunders et al. (2009), deductive and inductive approaches are the most common approaches to research. The deductive approach is also known as a top-down approach which moves from general to specific. Using this approach, the researcher develops a theory or hypothesis and then designs a research strategy to test the theory. On the other hand, the inductive approach is also called the bottom-up approach which moves from specific to general. By employing the inductive approach the researcher begins by collecting the data and developing a theory. In the deductive approach, the hypotheses are first formulated and then the theory is tested. The following can be described as some of the important characteristics of the deductive approach (Saunders et al., 2009):

1. There must be a causal relationship.

2. The researcher should be dependent of what is being observed.

3. The concept must be activated in such a way as to quantify the facts quantitatively.

4. Generalisation.

The philosophy of this study is based on the positivistic view. Saunders et al. (2009) stated that the deductive approach owes more to positivism whereas the inductive approach tends towards interpretivism. Keeping the above discussion in view, it can be concluded that the deductive approach is the most appropriate approach for this study.

As the researcher is interested in studying the relationship between MIS, TQM and organizational performance, for this purpose, the researcher has formulated the research hypotheses to test the underlying relationship between MIS indicators, TQM and organizational performance. The quantitative data are collected by survey and statistical techniques used for analysis. A representative sample is determined using random sampling technique.

3.3 Research Design

A research design is a framework or a study plan used as a guide for data collection and analysis. It is a scheme to complete the study. A research design is a blueprint for data collection and analysis. It is a map developed to guide the search (Pandey & Pandey, 2015).

The role of research design is to link the questions to data. The design sits between the two, as it explains how to link the search questions with data, tools and procedures to be used in response (Zhang, 2000).

A research design should follow the questions and fit them with data. The design is the basic plan which is part of the experimental research and involves key ideas such as strategy, sample, tools and procedures that will be used to collect and analyse the empirical data (Punch, 2000).

According to Saunders et al. (2009), there is exploratory research versus descriptive research. Exploratory research is conducted for the purpose of getting new information or insights about certain phenomena that have not been investigated before. While descriptive research is more suitable where the objective of the research is to give an accurate profile of persons, situations or events (Robson, 2002). Such research is usually conducted to answer questions concerning what, where, how, why, who and when (Saunders et al., 2009).

Understanding the nature of the research enables the researcher to ensure that the aim of the study is achieved. The goal of the current research is to examine the role of MIS on organizational performance. In addition, the mediating role of TQM between the relationship of the MIS and organizational performance is also examined. Hence, the descriptive research design is chosen for this study. Hair, Black, Babin, & Anderson (2010) argue that descriptive research has the characteristic to answer the questions relating to where, what, how, when and why. The survey, in the form of mailed questionnaires, therefore, the chosen research method to be utilised in this

study. Attempting to offer "a snapshot of one point of time" (Cooper & Schindler, 2013), the cross-section is a more suitable design to characterise the current study.

3.4 Research Strategy

The selection of an appropriate research strategy is another important step in research methodology. The label which is attached to a particular study is not important, but what is important is the appropriateness of a particular research strategy as to whether or not it covers the research objectives and questions (Saunders et al., 2009). Researchers must ensure that the strategy employed is simple and can answer all the research questions in order to achieve the objectives of the study. The researcher used the survey method in order to answer the research questions and to accomplish the aim and objectives of this study. The survey method is a well-liked strategy in business and management (Saunders et al., 2009; Sekaran, 2003). Saunders et al. (2009) described the survey method as a research strategy that is linked with the deductive research approach, as it provides quicker, easier, less expensive and more a reliable way for collecting data and information. According to Sekaran (2003), the survey method is a research strategy that is mostly used in descriptive and co-relational studies.

3.5 Nature of Research

According to Sekaran (2003), the two main types of research employed based on data are collected from quantitative research and qualitative research, respectively. Identifying the nature of the research is very important for a researcher because the selection of a suitable type of research affects the results and significance of a research project (Kumar, 2005). In the same context, Cryer (2000) pointed out that the researcher must identify and understand the nature of the research because it may affect the questions asked, the methods opted, the statistical analysis used, the inferences made by the researcher and the final goal of the research.

According to Kumar (2005), quantitative research is an objective, formal and deductive approach to problem-solving and is based on positivist philosophy. Mason (1996) defined quantitative research as an inquiry into a known problem, based on testing a theory, measured with numbers and analysed by employing statistical tools. Cryer (2000) described that quantitative research includes the counting and measurement of events and conducting the statistical analysis of a body of numerical data. According to Mason (1996), quantitative methods, if employed, can provide a high-level of precision in measurement and statistical power.

On the contrary, qualitative research is a subjective, informal and inductive approach to problem-solving and is based on the interpretivism philosophy. Research based on a qualitative process of inquiry looks into human or social problems from several perspectives. Such research is conducted in a natural environment and involves the development of a complex and comprehensive view of the phenomenon

under observation (Mason, 1996). While conducting qualitative research, the researcher tries to explore the implementation of a model or theory in various contexts that a model or theory will emerge from the data (Sekaran, 2003).

After considering the nature of the objectives of this research, a quantitative research design was justified as the appropriate type of research for the present study due to its purpose and type of data. In reviewing the literature, the researcher found that a majority of the studies on MIS, TQM, and organizational performance have been conducted through a quantitative approach using survey methods. Furthermore, the research questions formulated for the current study necessitate the collection of data through a survey instrument. Also, the study tests the hypotheses related to the relationships proposed in the model of the study, as it requires the use of inferential statistics, which corresponds to the quantitative analysis. Taking into account the research questions and hypotheses of the study, the design of quantitative research using the survey methodology is most appropriate for this study.

3.6 Population and Sampling

A target population is defined as the totality of cases that conform to some designated specifications (Iacobucci & Churchill, 2010). A population refers to the group of people or organizations of interest to the researcher (Sekaran & Bougie, 2010). The population in this study is made up of managers of high, middle and low levels at the Missan Oil Company. Among the reasons for choosing these managers are that they are responsible for making decisions. In addition, these managers play a key role in

the prevalence of quality culture as well as a role in directing and evaluating employee's performance (Boon, 2013). Hence they are more appropriate to the variables of this study than ordinary workers.

The rationale behind choosing the Missan Oil Company from these two regions was:

1. The Missan Oil Company is the second highest contributor to Iraq's Gross Domestic Product (GDP) and government revenues, as the company employs about 5000 employees and is producing around 425 000 barrels per day (According to statistics of the Iraqi Ministry of Oil for oil production in September 2017www.oil.gov.iq/index.php?name=Pages&op=page&pid=113).

2. Geographical accessibility, cost constraints and time and law and order situations were compelling factors that hinder in enhancing the coverage area beyond the selected region.

3. There is a scarcity of researches conducted that dealt with the company since it was newly established in 2008 (Saddam & Mansor, 2015; Mohammed, Eman, Hussein, & Hasson, 2015; Dawood, 2016; Alaraqi, 2017). In addition, in the past, there have been numerous political and security disturbances in the southern region of Iraq, where the company is located.

3.6.1 Population Framework

According to Cryer (2000), population framework is an organized list used to define a population of interest. It provides a list of items from which a researcher can select a sample as part of the targeted population, because in social science research, usually, the researchers do not have direct access to the whole population of interest (Neuman, 2005). The population framework for this present study consists of the Missan Oil Company which is operating in the south of Iraq.

According to the organizational structure of the Missan Oil Company, there are 298 managers across the three levels of authority as detailed in Table 3.1.

Table 3.1

Managerial Divisions of the Managers at The Missan Oil Company

Organizational Level	Number
Top	14
Middle	55
Low	229
Total	298

Source: Organizational Structure for The Missan Oil Company (www.moc.oil.gov.iq).

3.6.2 Sampling Procedure

There are two methods of sampling. The first method is the probability method and the second is non-probability method. According to Sekaran and Bougie (2010),

probability sampling designs are used when the representativeness of the sample is of importance in the interests of wider generalisability, and the samples are chosen randomly. In contrast, non-probability sampling is based on the selection by non-random means. This can be helpful for specific studies, for example, for quick surveys or where access to the entire population is difficult (Walliman, 2011). In addition, five main techniques of probability sampling can be used to determine the sampling method, namely simple random, systematic, stratified random, cluster and multistage. In contrast, the non-probability sampling has five sampling methods consisting of quota sampling, purposive sampling, snowball sampling, self-selection sampling and convenience sampling (Saunders et al., 2009).

Moreover, a probability sample provides the opportunity to know the probability or probability of the population, whereas the non-probability sampling sometimes only illustrates the population. It is difficult to understand non-probabilistic sampling. However, it is more accurate and rigorous (Trochim, 2006).

There are many options when selecting a sampling procedure. They include simple random sampling, stratified sampling, cluster sampling, and systematic sampling. This step is interlinked inextricably with the identification of the sampling frame because the choice of sampling method depends on what the researcher can develop in this aspect (Walliman, 2011).

According to Fraenkel, Wallen and Hyun (2015), simple random techniques are regarded as the most common techniques in the sampling process in which each member of the population has an equal and independent chance of being selected.

To ensure that the sample is representative of the whole population of the study and to make a generalisation of the study findings, this study used the simple random technique.

3.6.3 Sampling Size

According to Saunders et al. (2009), the sample of a study is made up of all possible units in which data can be collected and the results can be generalised. Sampling is the process of selecting a segment from the target population in such a way that it accurately and fairly represents the entire population (Sekaran, 2003).

The sufficiency of the sample size should be achieved based on the data analysis conducted in the current study. Many researchers have recommended several suggestions on the minimum sample size required for SEM. Williams & Holahan (1994) opined that a minimum sample size of 100 is most suitable for an SEM analysis. Conversely, Kelloway (1998) and Marsh, Balla & McDonald (1988) confirmed that a sample size of 200 may be needed in order to get the valid goodness-of-fit measures. To implement the SEM analysis, it is suggested that "an optimal sample is between 100 and 200" for it to be deemed satisfactory and sufficient (Hair et al., 2010) as proposed by (Forza & Filippini, 1998; Boon, 2013).

According to Krejcie and Morgan (1970), the sample size for a population of approximately 298 is 169. Most researchers recommend a typical sample size in studies in which SEM is used for about 200 cases. However, the sample size of 200

cases may be very small when analyzing a complex model, and therefore preferably a figure greater than 200 cases (Kline, 2011). Therefore, the sample size for this study is 250 to be considered adequate and satisfactory to yield a confidence level of 95% with a 5% sampling error according to the previous opinions.

3.7 Unit of Analysis

The analysis unit can be seen as representing the level of aggregation of data collected during the next data analysis stage (Cavana, Delahaye, & Sekaran, 2001). It consists of cultures, organizations, departments, work-groups, dyads, and individuals (Zikmund, 2003).

According to Cavana et al. (2001), as soon as the research question is formulated, the analysis unit must be determined because data collection techniques, sample size and even interest variables may be identified or sometimes routed according to the level of data being collected for analysis.

Various units of analysis have been adopted by previous researchers in the studies which have been conducted on MIS within organizations, for example, managers and head of departments. Based on the objectives and questions mentioned in Chapter 1, the unit of analysis for the current study involves the low, middle and high-level managers (i.e. executives, managers, senior managers, and managing directors) at the Missan Oil Company.

There is increasing interest and commitment towards MIS among managers. This sets the basis for investigating the relationship of MIS with the organizational performance of the Missan Oil Company. It is hoped that this provides a suitable model for other companies in Iraq to gain and implement MIS.

The Iraqi oil sector, represented by the Missan Oil Company, has been chosen due to two reasons. Firstly, in Iraq, the number of studies that have investigated the application of MIS in this industry is limited. Secondly, is the importance of the role of the oil industry in the Iraqi economy, which constitutes 86% of Iraqi exports (Federal Budget Law of the Republic of Iraq for the financial year 2017 www.ar.parliament.iq).

3.8 Data Collection

There are two types of data obtained for this study:

1. The Primary Data

Data collection can be conducted by a quantitative survey. The primary data can be obtained through questionnaires, interviews, observations tests, or experiments. Secondary data sources provide a level of information which are collected from original works. This refers to information that is gathered from sources that already exist, such as books on specific subject and reviews of research, articles and journals (Saunders, Lewis, & Thornhill, 2012). In this study, the data collection process was divided into three main phases.

The primary data were gathered directly from the managers working at the Missan Oil Company. A self-administered questionnaire was adopted to collect data on the perceptions of the respondents regarding the variables of the study. A self-administered questionnaire is designed for this study and distributed to the respondents through mail. The self-administered questionnaire consists of four main sections. Section (A) of the questionnaire consists of the demographic profiles of the respondents including company information, education, experience, job title, gender, etc. Section (B) of the questionnaire captures the perceptions of the respondents on MIS indicators; Section (C) of the questionnaire also captures the perceptions of respondents that are related to TQM; while section (D) relates to the organizational performance. After distributing the questionnaires, the researcher followed up with the respondents through emails and phone calls to ensure the timely collection of data. This study examined the relationship between MIS indicators (system quality, information quality, service quality, use of system, user satisfaction and net benefits) and organizational performance. The mediating variable investigated in this study is TQM. A detailed description of the instrumentation for measurements is provided in Figure 3.1. The next subsection will discuss the instrumentation process of the current study.
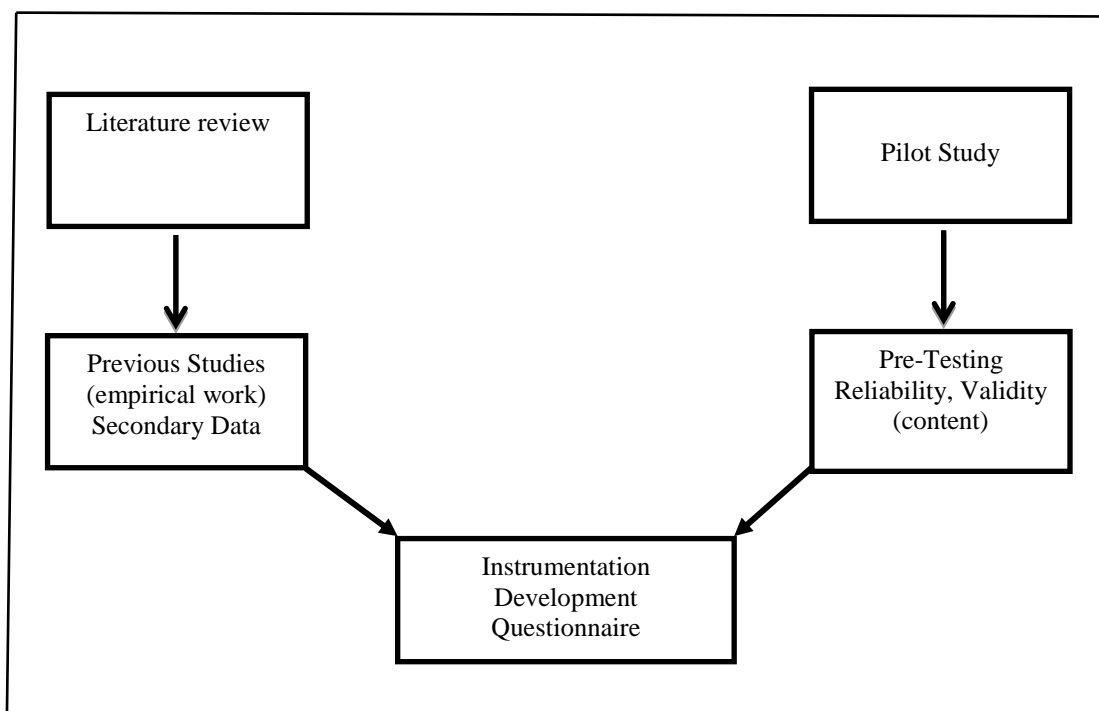
Figure 3.1. Instrumentation Development

2. The Secondary Data

The secondary data for this study is collected based on the report of the Extractive Industries Transparency Initiative (2016). This data is related to the Iraqi oil sector, which is the largest economic sector. The data includes the names of companies, staff, organizational structures, annual achievements, annual exports, and imports. Furthermore, the Iraqi Oil Ministry publishes an annual guide containing up-to-date and reliable information on the company's size, the names of directors and ways to communicate with companies. Moreover, the Ministry provides information on target companies through its website (www.oil.gov.iq/ar) and the Missan Oil Company website (www.moc.oil.gov.iq). In addition, secondary data is obtained from articles, theses and books.

3.9 Instrumentation Development

The survey instrument for this study utilised different scales developed by the researcher. These scales were used previously in different contexts, and the current study validated the questionnaire concerning the Iraqi oil and gas sector. In total, 250 questionnaires were distributed to the selected respondents of the Missan Oil Company in Iraq. The instrument is provided in appendix (B).

3.10 Questionnaire Design

The questionnaire design follows the overall guidelines for designing the questionnaire in order to produce an attractive, simple and standardized data collection tool that answers the questions of this study. The survey involves an introductory letter and the questionnaire itself. The cover letter describes the primary objective of the questionnaire, and respondents confirm the confidentiality of their goals.

The questionnaire has four sections which consist of 64 items distributed in 16 dimensions and a nine-page cover letter. Section (A) is designed to collect the demographic information of the respondents. In this part of the survey, there are seven questions that are supposed to gather some information about the respondents. The questions cover the gender of the respondent, age, education, and years at the current position, practical experience, specialisation, and tenure. Section (B) includes 24 questions related to MIS indicators. Section (C) includes 24 questions that are related

to TQM. Lastly, Section (D) includes 16 questions on organizational performance. With regard to the scale, Kinnear and Taylor (1987) noted that there was little difference in the findings (Asiaei, 2014). To facilitate the answers from the respondents, a five-point Likert scale was used from 1 (strongly disagree) to 5 (strongly agree) for measuring the statement of each respective sub-question.

3.11 Measurement of MIS Indicators

In this study, MIS indicators are divided into six variables to reflect the complex role and relationship of these indicators. The variables related to the MIS include (system quality, information quality, service quality, use of system, user satisfaction and net benefits). Each variable includes four items. The variables related to the MIS indicators are described in detail in Table 3.2. The scale being used for all independent variables is the 5-point Likert scale (1-5). Where 1 is 'strongly disagree' and 5 is 'strongly agree'.

Table 3.2

Summary Items for MIS Indicators

Variables	Items	References
System Quality	1. The MIS in my company is easy to use. 2. The functions of the MIS in my company meet my requirements. 3. The MIS in my company is always available. 4. The MIS in my company is safe.	(Seddon & Kiew, 1996) (Allour, 2010) (Leila A Halawi, 2005) (Gay, 2012)

Information Quality	1.	The MIS in my company presents information in a useful format and is understandable.	(Allour, 2010)
	2.	The MIS in my company often presents information at a time suitable for its use.	(Almutairi,2001)
			(Elmorshidy,2004)
	3.	The MIS in my company provides more current (up-to-date) information.	(Gay, 2012)
	4.	The MIS in my company provides the beneficiaries with accurate information.	
Service Quality	1.	The response time of the MIS in my company is good.	(Allour, 2010)
	2.	The MIS in my company provides a decent service for users.	(Elmorshidy, 2004)
	3.	The service quality of the MIS in my company affects the extent to which the system can be used.	
	4.	My company has specialists in MIS to address technical problems and emergencies if any.	(Leila A Halawi, 2005)
			(Gay, 2012)
Use of System	1.	I often use the MIS applied in my company.	
	2.	I am very interested in the process of continuing to use the MIS in my company to accomplish the tasks entrusted to me.	(Gay, 2012)
			(Elmorshidy, 2004)
	3.	The human and material resources supporting the MIS in my company have helped its success.	
	4.	The number of participants in the use of MIS in my company has been constantly increasing since its inception.	(Leila A Halawi, 2005)
User Satisfaction	1.	Using my company's MIS helps improve productivity.	(Allour, 2010)
	2.	The MIS in my company is very efficient.	(Leila A Halawi, 2005)
	3.	The MIS in my company is flexible enough.	(Elmorshidy, 2004)
	4.	I am satisfied with the accuracy and objectivity of my company's MIS.	(Seddon & Kiew, 1996)
Net Benefits	1.	Using the MIS in my company helps reduce the time allotted to accomplish my tasks.	
	2.	Using the MIS in my company will improve my job performance.	(Gay, 2012)
			(Seddon & Kiew, 1996)
	3.	The application of the MIS in my company helps increase productivity.	
	4.	The MIS in my company enhances the effectiveness of my job.	

The purpose for the mentioned questions in the questionnaire is to support the hypothesis of the relationship between the basic MIS indicators (system quality, information quality, service quality, use of system, user satisfaction and net benefits) with organizational performance and TQM.

3.12 Measurement for TQM

In this study, TQM covers six measures, namely the practice of leadership, customer focus, human resource management, strategic planning, process management, and information & analysis. Each variable includes four items. The preparation of these items is based on the study by Prajogo and Sohal (2006a), where these items on the scale are divided as shown in Table 3.3.

Table 3.3

Summary Items for TQM

Variables	Items
The Practices of Leadership	1. Senior management in my company has similar beliefs about my company's future direction.
	2. Senior management in my company often cares about changes and supports the implementation of a culture of improvement, learning and innovation to achieve "excellence".
	3. Employees in my company have the opportunity to participate in the implementation of the change procedures required.
	4. My company has a high level of target unit at the individual and department level without any barriers.
Customer Focus	1. My company constantly gets input from customers to identify and meet their needs and expectations.
	2. My company has close relationships with its customers and works to create easy channels to communicate with them.

	3.	My company constantly listens to customer's complaints and works to solve them first hand.
	4.	My company uses a variety of methods to measure customer satisfaction.
Human Resource Management	1.	My company conducts ongoing training programmes to develop staff capabilities including jobs planning.
	2.	My company is interested in measuring employee satisfaction periodically and regularly.
	3.	My company runs two-way communication from "top to bottom" and "bottom to top".
	4.	My company always cares about maintaining a working environment to ensure the health and safety of all employees.
Strategic Planning	1.	My company establishes a clear vision supported by all employees to determine the direction of its future business.
	2.	My company uses comprehensive planning tools that contribute to the review of short and long-term goals.
	3.	My company pays great attention to developing its plans, policies and objectives to meet the aspirations of all stakeholders and the community.
	4.	My company adopts a major strategy with the approval of senior management covering all operations and at all levels.
Process Management	1.	My company maintains clear and documented instructions that are understood by all employees about the procedures.
	2.	My company adopts advanced statistical methods in improving processes and reducing contrast.
	3.	My company continues to establish strategic partnerships with suppliers.
	4.	My company has a supplier evaluation guide and rating according to internationally accepted performance standards.
Information & Analysis	1.	My company uses an effective performance measurement system to assess overall organizational performance.
	2.	Data and information about my company's performance are always available to the relevant parties.
	3.	The senior management of my company meets regularly to determine its performance and use it as a basis for future decisions.
	4.	My company compares consistently with similar companies in the field of work.

Source: Adapted from D.Prajogo & A.Sohal, 2006a.

The purpose of the mentioned questions in the questionnaire is to support the hypothesis concerning the relationship of TQM, which mediates the relationship between MIS indicators and organizational performance.

3.13 Measurement for Organizational Performance

In this study, the BSC is used to measure organizational performance, which includes four perspectives (financial perspective, customer perspective, internal process perspective and learning & growth perspective). The perceptions of the respondents were measured on a 5-point Likert scale in which 1 is 'strongly disagree' to 5 'strongly agree'.

Each variable includes four items. The preparation of these items is based on the study by Blackmon (2008), except for the internal process perspective which has been relied upon (Blackmon, 2008; Mafini & Pooe, 2013). These items in the scale are divided as shown in Table 3.4.

Table 3.4

Summary Items for Organizational Performance

Variables	Items
Financial Perspective	1. My company is prioritising programmes that are very effective in cost containment.
	2. My company is very effective in maintaining spending.
	3. My company has sufficient funds to provide service programmes.
	4. My company has a clear vision of the process of allocating financial resources proportionately across programmes.
Customer Perspective	1. My company is constantly working to meet the expectations of its customers.
	2. There has been significant improvement in the quality of my company's products.
	3. There has been significant improvement in my company regarding the timing of meeting the needs of its customers.
	4. The demand for my company's products is growing significantly.
Internal Process Perspective	1. My company practices improved methods in its planning processes.
	2. My company is interested in improving quality control processes.
	3. My company takes a broad interest in its policies and procedures.
	4. My company seamlessly connects communications across all organizational levels.
Learning & Growth Perspective	1. My job is directly related to my area of speciality.
	2. My job gives me a sense of accomplishment.
	3. In my company, I received enough information to meet the requirements of my assigned task.
	4. My company provides the training I need to meet my job requirements.

Source: Adapted from V.Y. Blackmon, 2008. And C. Mafini & D.R. Pooe, 2013.

The purpose of the questions mentioned in the questionnaire is to support the hypothesis concerning the relationship of MIS indicators with the organizational

performance. Also, this is to support the hypothesis concerning the relationship of TQM with the organizational performance.

3.14 Pre-Testing of The Questionnaire

In order to preserve the quality and content validity, the study instrument needs to be evaluated before doing the pilot study (Boudreau, Gefen, & Straub, 2001). Hence, pre-testing is undertaken for the main purpose of extracting feedback in relation to understanding, phrasing and the design of the questionnaire. In effect, measurement errors generally stem from the manner questions are asked and from the sequence of the questionnaire that may, in turn, deter participants from responding to the survey questions properly (Dillman, 1991). Therefore, the instrument was refined through pre-testing by Subject Matter Specialists (SMS). The study instrument was presented to a group of subject matter specialists comprising of six specialists. Two of them are academic members in the Faculty of Management & Economics at the Universiti Pendidikan Sultan Idris (UPSI), and two academics from the Faculty of Administration and Economics at the Universities of Basra and Missan in Iraq, and the others are expert administrators in the Missan Oil Company as shown in Table 3.5.

Table 3.5

The Names of Specialists

No.	Academic Title	Administrative Position	Workplace
1	Professor Dr.	=	Faculty of Management & Economics at UPSI, Malaysia
2	Senior Lecturer Dr.	Head of department business management and entrepreneurship	Faculty of Management & Economics at UPSI, Malaysia
3	Assistant Professor Dr.	=	Faculty of Management & Economics at Basra University, Iraq
4	Assistant Professor Dr.	=	Faculty of Management & Economics at Missan University, Iraq
5	Senior Lecturer Dr.	Head of administrative affairs department	Missan Oil Company, Iraq
6	Senior Lecturer Dr.	=	Missan Oil Company, Iraq

The researcher asked the subject matter specialists to express their views and suggestions where necessary to modify, delete or add new questions, as well as express their views with regard to the preliminary data, such as personal and functional characteristics of the respondents. The subject matter specialists criticised the length of the questionnaire. The researcher reduced the number of questions, from 74 to 64 questions. Also, their ideas and comments helped to change, add and modify some items.

As a result, the questionnaire was revised based on their valuable comments and feedback regarding total planning coordination, content formulation, and ordering

by adding, removing, or redesigning items as and when necessary. Most significantly, the items were reviewed and judged whether the measurement of each item is according to the theoretical construct nominated. Also, the content validity was already established largely because all the items utilised in this study are based on a validated instrument developed and used by highly prestigious scholars in the related field.

3.15 Pilot Testing

As mentioned earlier, most of the studies on MIS and organizational performance were conducted in a different context, courtiers and sector. Therefore, before investigating the relationship between MIS and organizational performance with the mediating role of TQM at the Missan Oil Company, it is necessary to undertake a pilot study to assess whether respondents can understand the language and wording of the questionnaire. If there is any ambiguity, the researcher can address this issue and amend the questionnaire.

According to Lackey and Wingate (1998), a number of researchers suggested that 10% the size of the final study should be appropriate and sufficient to conduct a pilot study, particularly in social sciences studies (Omira, 2015). In addition, Zikmund (2003) suggested that the size of the pre-testing group could be 20 to 50 subjects. According to Hertzog (2008), samples as small as 10–15 per group can sometimes be sufficient but a sample in the range of 20–25 will probably be adequate when the population effect sizes are likely to be moderate or larger.

For the current study, a sample of 25 respondents (i.e., 10% of the sample size of the total respondents) from the Missan Oil Company have offered to participate in the survey who were then questioned to determine if any of the items caused confusion. It is worth noting that participants who were participatory in the pilot test procedure were deliberately excluded from the survey. The reliability of the sample questionnaire was tested to verify the reliability and validity of the questionnaire. Table 3.6 shows the results of the pilot testing and found it to be consistent. Different authors have mentioned different thresholds for the acceptable value of Cronbach's alpha (Cooper & Schindler, 2013), but the present study used the value of 0.70 as a threshold value of construct reliability. The SPSS software version 24 is used for estimating the internal consistency of the instrument. Results indicated that the reliability of each construct is above the threshold value of 0.70. This indicates the internal consistency of the questionnaire for the current study.

Table 3.6

Reliability of Instrument on The Basis of Pilot Test

Sr.	Dimension	Alpha (α)	No. of items
1	System Quality	0.816	4
2	Information Quality	0.809	4
3	Service Quality	0.801	4
4	Use of System	0.809	4
5	User Satisfaction	0.806	4
6	Net Benefits	0.812	4
7	MIS	0.954	24
8	TQM	0.939	24
9	Organizational Performance	0.915	16

3.16 Data Analysis

Data analysis is conducted to find answers to the research questions mentioned in Chapter One. This section relies on the statistical analysis to verify all the hypotheses. As the quantitative methodology is utilised in the current study, statistical analysis is done through SPSS 24 and AMOS 21. This statistical tool is reliable and widely applied in social science research. The current study depends on the causal relations among the variables in which the relationship between MIS and organizational performance on the mediating role of TQM has been investigated. This study used SEM for data analysis. However, objective two was addressed through descriptive analysis and mediation analysis applied the Preacher and Hayes (2008) method of using bootstrapping to test the indirect effects. Details of the methods applied for data analysis for each objective and related analysis techniques are listed in Table 3.7.

Table 3.7

Research Objectives, Questions and Data Analysis Methods

Objectives	Questions	Hypotheses	Analysis
1. To examine the effect of MIS indicators on organizational performance and identify the most effective MIS indicators in organizational performance at the Missan Oil Company.	1. Do MIS indicators affect organizational performance and which of the MIS indicators dominantly affect organizational performance at the Missan Oil Company?	H1 – H6 MIS indicators are positively related to organizational performance.	SEM using direct effect.
2. To examine the effect of MIS indicators on TQM at the Missan Oil Company.	2. Is there any effect of MIS indicators on TQM at the Missan Oil Company?	H7 – H12 MIS indicators are positively related to TQM.	SEM using direct effect.
3. To examine the effect of TQM on organizational performance at the Missan Oil Company.	3. Is there any effect of TQM on organizational performance at the Missan Oil Company?	H13 TQM is positively related to organizational performance.	SEM using direct effect.

4. To examine the mediating role of TQM in the relationship between MIS indicators and organizational performance at the Missan Oil Company.	4. Does TQM mediate the relationship between the MIS indicators and organizational performance at the Missan Oil Company?	H13 – H19 TQM mediates the relationship between MIS indicators and organizational performance.	Mediation analysis using indirect effects and bootstrapping.

3.16.1 Data Screening

Data screening is necessary to ensure that the data is accurately coded, to ensure that the responses are valid (i.e. within the acceptable bounds), be aware of missing data, and to check for normality and linearity of the data, whether there are assumptions behind the analytic techniques used (Tabachnick & Fidell, 2013). The researcher used data screening procedure to filter the data before further analysis. Data screening was done in stages as follows:

3.16.2 Missing Value Analysis

Missing value analysis is important in order to remove any discrepancies in the data. Usually, during the survey, there is the possibility that some questions will remain unanswered. Thus, it is important to replace those missing values before proceeding to the data analysis stage (Hair et al., 2010). In this study, the manual deletion method was used for the list-wise. For example, Allison (1998) debated that the list-wise deletion method is better than the maximum likelihood or multiple imputations as it is equipped with valid inferences, in case the data includes missing values at random.

3.16.3 Detection of Multivariate Outliers

This test is applied to rebut the effect of extreme value on the total mean of the item (Sekaran & Bougie, 2010). Various methods are utilised to recognise the extreme values, as z-score and box-plot. According to Hair et al. (2010), Mahalanobis distance statistical analysis is the preferred method to uncover outliers. Moreover, this research performed Mahalanobis distance statistical analysis using AMOS 21.

3.16.4 Descriptive Analysis

Descriptive statistics were performed on all demographic information in order to see the frequency distribution of the respondents. It is important in accessing the characteristics of the sample and population. Raw data is converted into a form to provide meaningful information (Sekaran, 2003). These descriptive statistics include the mean, standard deviation and frequency tables (Pallant, 2007).

3.16.5 Structural Equation Modeling

The covariance-based SEM technique is a second-generation data analysis method (Bagozzi & Fornell, 1982) was utilised to test the hypothesis. SEM analysis provides a more accurate analysis by combining the analysis of the structural and measurement models. The structural model examines the causal relationship between a set of independent and dependent constructs, while the measurement model reports loadings

and links observed items to their latent variables. The standardized coefficients (betas) denote the relative strength of the statistical relationships. Moreover, measurement errors of the observed variables are inserted and analysed in the model (Gefen, Straub, & Boudreau, 2000). SEM is a mix of multiple regression and factor analysis.

This study used a covariance-based SEM analysis using AMOS 21 software. The AMOS technique represents the implicit structural relationships of all three latent variables together (i.e. MIS indicators, TQM and organizational performance). The SEM can be done in two stages. At the initial stage, the researcher assessed the measurement model to test the fitness of the items to construct relationships. Once the measurement model is validated, the next stage was to test the hypothesis using the structural model. The details of each stage in SEM are given in subsections.

3.16.5.1 Measurement Model

SEM was applied to investigate the fitness of the measurement model. Furthermore, the Confirmatory Factor Analysis (CFA) validated the appropriateness of each item among the latent construct. The goodness of model fit can be investigated by comparing the values of goodness-of-fit by its fit indices. For example, Hu and Bentler (1999) provided the threshold values of the goodness-of-fit index for each fit index. The most famous fit indices which have been previously reported to show the goodness of the model were $\chi2$ =Chi-square; DF= Degrees of Freedom; CMIN= Minimum Chi-square; CFI= Comparative Fit Index; TLI= Tucker Lewis Index; RMR= Root Mean Square Residual; RMSEA= Root Mean Square Error of

Approximation and SRMR= Standardized Root Mean Square Residual. Table 3.8
shows the acceptable threshold values of CFA regarding each fit index.

Table 3.8

Fit Indices and Their Acceptable Thresholds

Fit Index	Acceptable Threshold Levels
Fit ratio	3.0 (Bagozzi & Yi, 1988)
CFI	Values greater than 0.90 (Hu & Bentler, 1999)
TLI	Values greater than 0.90 (Bentler & Bonett, 1980)
RMR	Values less than 0.08 (Browne & Cudeck, 1992)
RMSEA	Values less than 0.08 (Browne & Cudeck, 1992)
SRMR	Values less than 0.08 (Browne & Cudeck, 1992)

Source: Adoption from J. Hair, W. Black, B. Babin, & R. Anderson, 2010.

The aim of the CFA evaluation is not exclusive, as it also provides the validity
of the instrument. Measurement validity contains the goodness of model fit and
construct's validity. One of the basic assumptions for moving forward with SEM is
the need to validate this instrument. The latent constructs or measurement model
reflects the accuracy of the construct validity. The two main types of construct
validity investigated in this study are convergent and discriminant validity.

3.16.5.2 Convergent Validity

Convergent validity is the construct indicators that reflect a huge amount of the
reciprocal proportion of variance between factors. It specifies the amount of

correlation between the measures of the same connotation (Cooper & Schindler, 2013; Hair et al., 2010). Convergent validity deals with construct loadings, Average Variance Extracted (AVE) and construct reliabilities. The AVE is the sum of squares of a standardized factor loading to represent how much variation in each item is explained by latent. The AVE is the average percentage of variance explained by the measurement items in a construct. The standard value of AVE is 0.50 or greater. To analyse the convergent validity, it is significant to examine whether all the items of the questionnaire are importantly loaded on a construct.

3.16.5.3 Discriminant Validity

Discriminant validity refers to the extent to which an instrument contains a construct that was truly distinct. Discriminant validity is the degree to which similar constructs have distinct values. For example, in the current study, the items to measure the system quality should be different in nature compared to the items used to measure information quality. In this kind of validity, the respondents' responses are measured without cross-loading in terms of latent constructs (Arbuckle, 2011; Hair et al., 2010). Discriminant validity is fractured when the inter-construct correlation is above 0.85 (Cooper & Schindler, 2013). In discriminant validity, the value of the square root of AVE must exceed the value of all inter-construct correlations of that construct.

3.17 Structural Model (Hypothesis Testing)

Once the measurement properties for the constructs are found to be reliable and valid, a structural model would be built to test the interrelationships between MIS indicators, TQM and organizational performance. SEM was applied to test the model and specify the importance of the structural paths among the constructs of the hypothesised model. Therefore, the direct and indirect impact of hypothesised relationships was estimated. In the hypothesised structural model, MIS indicators are independent variables while organizational performance is a dependent variable and TQM is a mediating variable. The hypothesis for the direct relationship was tested in the structural model.

3.18 Mediation Analysis

The present research aims to test the mediation impact of TQM between the relationship of MIS indicators and organizational performance. The current study used the method proposed by Preacher and Hayes (2008), to test the mediation hypotheses. This method utilises a two-step approach. First, the product of the coefficient approach as recommended by MacKinnon (2000), and secondly, the bootstrapping method as suggested by Preacher and Hayes (2008).

MacKinnon (2000) proposed an approach for mediation analysis. This approach states that an extension of the product of coefficients must be applied to estimate the importance of the overall indirect impact and pairwise contrasts between

certain indirect impacts. Preacher and Hayes (2008) explained the MacKinnon's approach for mediation analysis is to smooth the progress by employing the product of coefficients approach and to bootstrap the confidence intervals for both the total and certain indirect impacts which also pairwise the contrasts of certain indirect impacts. Azen and Budescu (2003) used a similar method.

The indirect impact between MIS indicators and organizational performance through TQM was calculated, and the confidence intervals were calculated utilising the bootstrap technique. Bootstrap analysis is a non-parametric approach, which means that it makes no assumptions about the sampling distribution of the variables or of the indirect effects. Bootstrapping includes the generating series of unique data sets, called bootstrap samples; by directly taking samples from the original sample and estimating the indirect impact in each resampled data set. Therefore, the researcher got the significance of each indirect path. If the indirect path between each MIS indicators and organizational performance are significant, this indicates the existence of the mediation effect of TQM.

3.19 Measurement Error

Measurement error occurs at the time of data collection and is a type of non-sampling error, along with specification, frame, nonresponse, and processing errors (Biemer & Lyberg, 2003). Measurement error can be defined as "a difference" (Hansen, Hurwitz, Marks, & Mauldin, 1951) or "a discrepancy" (Sukhatme & Sukhatme, 1970) between the observed survey value and the true value, although the term difference might not

be the most suitable description for variables that measure properties on nominal and ordinal scales (Lesser & Kalsbeek, 1999).

According to Bavdaz (2010) and Bickman & Rog (1998), there are many approved methods for controlling or limiting the measurement error. In this study, the following methods were used:

a. Questionnaire

Many factors can lead to measurement error in the questionnaire design phase. The obscure questions of the questionnaire, inappropriate order of questions, lengthy questionnaires, and deficiency of instruction manuals are the most common factors that cause measurement errors in censuses and surveys (Zahedian & Saba, 2016).

The survey instrument for this study utilised different scales based on many references for each dimension as provided in section 3.9.

b. Expert Opinions

In order to maintain quality and content validity, the study instrument needs to be evaluated before doing the pilot study (Boudreau et al., 2001). The questionnaire was evaluated by a group of specialists comprising six experts.

The questionnaire was refined based on their valuable comments and feedback concerning the overall layout format, phrasing, and arrangement of the content by adding, removal or rephrasing of items as necessary as shown in section 3.14.

c. Pilot Study

Before collecting the data, pilot testing was conducted to detect the weaknesses and problems in the design and development of instrument/measures (Mastouri & Boumaiza, 2011). For this study, a sample of 25 people (i.e. 10% of the sample size of total respondents) from the Missan Oil Company offered to participate in the questionnaire was then interviewed to determine whether any of the items caused confusion.

The reliability of the questionnaire was tested to verify the reliability and validity of the questionnaire and the results were consistent as described in section 3.15.

d. Respondents

Respondents may contribute to error in measurement by failing to provide accurate responses (Kasprzyk, 2005). Statistical literacy of respondents, their confidence in the staff members of the executive organization or the statistical system, ensured protection of personal information, fear of revealing correct answers, memory fallibility, misunderstanding of survey concepts and many other similar factors are the issues related to respondents that cause measurement error in statistics (Zahedian & Saba, 2016).

To avoid these errors, the respondents in this study were selected carefully from among low, middle and high-level managers at the Missan Oil Company as described in section 3.7.

e. Response Rate

Response rate affects the size of measurement errors. Where the low response rates are considered invalid as the general rule adopted is that when the response rate is low the measurement error is large and vice versa (Nolinske, 1995).

According to Bryman and Bell (2015), a response rate of less than 50% shows a minor response rate and this may lead to incorrect generalization of the study results of the population. For this study, the response rate is 86% which is higher than 50%. Thus, it can be considered sufficient for generalizing the results.

f. Confidentiality of Information

Respondents are more likely to respond to items if they trust the researcher and feel confident their answers will not be attributed to or adversely affect them which reduces measurement errors and increases the response rate (Nolinske, 1995).

In this study, to encourage honesty in responding to the questionnaire, this study guaranteed confidentiality of responses to the participants. They were informed of the confidentiality agreement prior to their voluntary participation in the study. A portion of the statement of informed consent covers issues dealing with confidentiality of responses can be seen in Appendix A.

3.20 Summary

This study investigates the relationship between MIS indicators and organizational performance at the Missan Oil Company with the mediating role of TQM. The study uses a quantitative research design to achieve its objectives. The present chapter highlighted the methodology of the study. The chapter started with the philosophical stance of the study followed by the research design of study, population and sampling issues. Furthermore, it discussed the research instrument, data collection and analysis techniques used in the study. The subsequent chapter will present and discuss the findings of the study and deal with each of the research objectives and hypotheses.

CHAPTER 4

FINDINGS

4.1 Introduction

This chapter discusses the findings obtained from the data analysis. The chapter outlines the process of data preparation and data screening. It also describes the participants, followed by descriptive statistics of all the sampled variables. The current study used structural equation modeling techniques to analyse the data in reference to the formulated hypotheses.

4.2 Response Rate

In this study, 250 questionnaires were distributed to managers in the Missan Oil Company. The survey was carried out during the month of August 2018.

Out of the 250 questionnaires distributed, 219 responses were returned, as shown in Table 4.1. From the 219 responses, four questionnaires were discarded from the analysis because they were incomplete, making the final number of usable questionnaires 215 and yielding a valid response rate of 86%.

Table 4.1

Sample Study Response Rate

Questionnaire response	Frequency	Rate
Number of questionnaires distributed	250	100.00
Returned questionnaires	219	87.60
Questionnaires not returned	31	12.40
Usable questionnaire	215	86.00

4.3 Data Preparation and Screening

Before performing the data analysis, the accuracy of the data entered into the data file was ascertained to ensure the findings are accurate (Tabachnick & Fidell, 2013). This section discusses the data screening procedures prior to data analysis to detect the possibility of missing data, as these invalid values may threaten the validity of the

researcher's findings and, therefore, must be identified and addressed (Hair et al., 2010). Following this, the validity and reliability of the research construct and other assumptions were tested to check the validity of the measures and data.

4.3.1 Detection of Missing Data

In the present study, 250 questionnaires were distributed as described in Chapter 3, and 219 questionnaires were returned during data collection process. This produces a response rate of 87.6%. According to Bryman and Bell (2015), a response rate less than 50% shows a minority of the response rate which may lead to incorrect generalisation of the study results of the population. For the current study, the response rate is higher than 50%. Thus, it can be considered sufficient for the generalisation of the results for the current study. However, during the initial screening of the data, four questionnaires were found to contain missing values.

According to Tabachnick and Fidell (2013), missing data is among the most persistent problems during data analysis. For the current study, the researcher performed manual checking to achieve a high level of accuracy in the data entry procedure for each entry.

4.3.2 Detection of Outliers

Multivariate outliers in the current study were detected through Mahalanobis distance statistics using AMOS 21 (Hair et al., 2010). The results of the Mahalanobis distance test showed 14 observations out of 215 were considered as outliers. The Mahalanobis distance test calculates the square of the distance of each data point from the centroid of the data. Additionally, Mahalanobis distance test gives four columns of the tabulated results. The first column represents the response number, and column two provides the square distance of each data point from the centroid of the data. Furthermore, the second column shows the probability of any observation exceeding the squared Mahalanobis distance of that observation. The third column shows the probability that the largest squared distance of any observation would exceed the Mahalanobis distance computed. These values were used to determine the outliers of the data as suggested by Arbuckle (2011). For column p1, values less than 0.001 can be considered as outliers. Further, these responses were eliminated from further analysis. For the current study, 14 observations were considered outliers and were eliminated from the data before proceeding to the next stage of data analysis. The results of the Mahalanobis distance test are given in Table 4.2. Thus, 201 questionnaires were used for final data analysis.

Table 4.2

Observations Farthest From the Centroid (Mahalanobis Distance)

Observation Number	Mahalanobis d-squared	p1	p2
195	99.770	0.000	0.000
178	89.114	0.000	0.000
189	85.474	0.000	0.000
132	83.694	0.000	0.000
33	82.134	0.000	0.000
187	81.835	0.000	0.000
111	78.845	0.000	0.000
129	77.786	0.000	0.000
88	76.154	0.000	0.000
38	73.438	0.000	0.000
12	71.039	0.000	0.000
185	69.868	0.000	0.000
130	69.612	0.000	0.000
174	69.221	0.000	0.000

4.3.3 Reliability Analysis

Cronbach's alpha is used to examine the reliability of the internal consistency of the constructs. A cut-off point of 0.70 in the alpha's value indicates an acceptable degree of reliability of the construct (Cooper & Schindler, 2013). Table 4.3 shows the results of the pilot testing and found it to be consistent. SPSS version 24 is used to estimate the internal consistency of the instrument. The results indicated that the reliability of

each construct is above a threshold value of 0.70. This indicates the internal consistency of the questionnaire for the current study.

Table 4.3

Result of Reliability Analysis

Sr.	Dimension	Alpha (α)	No. of items
1	System Quality	0.837	4
2	Information Quality	0.847	4
3	Service Quality	0.784	4
4	Use of System	0.890	4
5	User Satisfaction	0.791	4
6	Net Benefits	0.817	4
7	MIS	0.928	24
8	TQM	0.900	24
9	Organizational Performance	0.901	16

4.3.4 Testing for Normality

The assumption under the planned analysis of this study was based on the normal distribution of the data. A Bell-shaped histogram or frequency polygons approximate a precise and important distribution called the normal distribution (Aron, Coups, & Aron, 2011). Data distribution, whether it is highly skewed or has high kurtosis, is an indication of non-normality, which has random effects on the specification or estimation (Doornik & Hansen, 2008).

Kurtosis refers to a measure of whether the data are heavy-tailed or light-tailed relative to a normal distribution. The two types of kurtosis are positive kurtosis and negative kurtosis. Positive kurtosis indicates heavier tails and high peaks, while negative kurtosis refers to the light tail and low peak. The value of kurtosis between -2 to +2 suggests the normal distribution of the data (Kline, 2011). For the current study, the range value of kurtosis is between -2 to +2. This shows the normal distribution of the data. Table 4.4 indicates the normality of the data for the current study.

Skewness refers to the distribution of the data distance to its means. The two types of skewness are positive skewness and negative skewness. Positive skewness indicates that the majority of the data penetration is towards the lower side of the mean, while negative skewness suggests that the majority of the values are higher than the mean value. A value of skewness between -2 to +2 refers to the normal distribution of the data (Kline, 2011). For the current study, the range value of skewness is between -2 to +2, showing normal distribution of the data.

Table 4.4

Descriptive Statistics and Normality

Items	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
							Std.		Std.
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Error	Statistic	Error
S1	201	1.00	5.00	3.4627	1.06294	-0.885	0.172	0.196	0.341
S2	201	1.00	5.00	3.4328	1.10757	-0.832	0.172	0.090	0.341
S3	201	1.00	5.00	3.0050	1.12026	-0.204	0.172	-0.768	0.341
S4	201	1.00	5.00	3.3781	1.12974	-0.597	0.172	-0.330	0.341
IQ1	201	1.00	5.00	3.4925	1.18372	-0.850	0.172	-0.077	0.341
IQ2	201	1.00	5.00	3.1542	1.18789	-0.393	0.172	-0.740	0.341
IQ3	201	1.00	5.00	3.2736	1.18311	-0.491	0.172	-0.657	0.341
IQ4	201	1.00	5.00	3.3284	1.14090	-0.488	0.172	-0.492	0.341
SQ1	201	1.00	5.00	3.2537	0.99514	-0.405	0.172	-0.157	0.341
SQ2	201	1.00	5.00	3.3184	1.07150	-0.541	0.172	-0.231	0.341
SQ3	201	1.00	5.00	3.3234	1.03918	-0.303	0.172	-0.314	0.341
SQ4	201	1.00	5.00	3.2040	1.15896	-0.367	0.172	-0.744	0.341
U1	201	1.00	5.00	3.4229	1.20220	-0.793	0.172	-0.229	0.341
U2	201	1.00	5.00	3.5821	1.18511	-0.890	0.172	0.040	0.341
U3	201	1.00	5.00	3.5025	1.20882	-0.769	0.172	-0.217	0.341
U4	201	1.00	5.00	3.3433	1.17327	-0.621	0.172	-0.396	0.341
US1	201	1.00	5.00	3.8060	0.93657	-0.599	0.172	0.219	0.341
US2	201	1.00	5.00	3.3085	1.06976	-0.642	0.172	-0.136	0.341
US3	201	1.00	5.00	3.2537	1.10919	-0.383	0.172	-0.417	0.341
US4	201	1.00	5.00	3.1841	1.18783	-0.326	0.172	-0.750	0.341
NB1	201	1.00	5.00	3.8756	0.93779	-0.704	0.172	0.215	0.341
NB2	201	1.00	5.00	3.7612	0.93418	-0.658	0.172	0.284	0.341
NB3	201	1.00	5.00	3.6766	0.99494	-0.544	0.172	0.000	0.341
NB4	201	1.00	5.00	3.7662	0.95919	-0.614	0.172	0.081	0.341
PL1	201	1.00	5.00	3.4925	1.11857	-0.696	0.172	-0.193	0.341
PL2	201	1.00	5.00	3.4577	1.07213	-0.332	0.172	-0.650	0.341
PL3	201	1.00	5.00	3.2935	1.12624	-0.323	0.172	-0.452	0.341
PL4	201	1.00	5.00	3.1791	1.13480	-0.213	0.172	-0.640	0.341
CF1	201	1.00	5.00	3.4229	1.16845	-0.458	0.172	-0.552	0.341
CF2	201	1.00	5.00	3.5025	1.02530	-0.681	0.172	0.227	0.341
CF3	201	1.00	5.00	3.3383	1.11129	-0.635	0.172	-0.184	0.341
CF4	201	1.00	5.00	3.2637	1.08403	-0.375	0.172	-0.547	0.341
HR1	201	1.00	5.00	3.6119	1.29563	-0.751	0.172	-0.522	0.341
HR2	201	1.00	5.00	3.4279	1.06114	-0.595	0.172	-0.035	0.341
HR3	201	1.00	5.00	3.2935	1.13508	-0.411	0.172	-0.575	0.341

HR4	201	1.00	5.00	3.3682	1.24249	-0.413	0.172	-0.865	0.341
SP1	201	1.00	5.00	3.5075	0.98549	-0.686	0.172	0.321	0.341
SP2	201	1.00	5.00	3.3831	0.99876	-0.525	0.172	-0.230	0.341
SP3	201	1.00	5.00	3.4975	1.01057	-0.536	0.172	-0.138	0.341
SP4	201	1.00	5.00	3.5274	0.98514	-0.584	0.172	-0.027	0.341
PM1	201	1.00	5.00	3.7910	0.95714	-0.814	0.172	0.500	0.341
PM2	201	1.00	5.00	3.3532	0.99980	-0.423	0.172	-0.269	0.341
PM3	201	1.00	5.00	3.5025	1.14510	-0.571	0.172	-0.408	0.341
PM4	201	1.00	5.00	3.4129	1.12411	-0.612	0.172	-0.351	0.341
IA1	201	1.00	5.00	3.6418	0.97007	-0.622	0.172	0.030	0.341
IA2	201	1.00	5.00	3.4577	1.01954	-0.642	0.172	-0.077	0.341
IA3	201	1.00	5.00	3.8308	.97018	-0.683	0.172	0.130	0.341
IA4	201	1.00	5.00	3.5174	1.04448	-0.658	0.172	0.013	0.341
FP1	201	1.00	5.00	3.5323	1.17907	-0.670	0.172	-0.270	0.341
FP2	201	1.00	5.00	3.3383	1.27082	-0.629	0.172	-0.652	0.341
FP3	201	1.00	5.00	3.4279	1.26729	-0.610	0.172	-0.625	0.341
FP4	201	1.00	5.00	3.1791	1.30298	-0.447	0.172	-0.964	0.341
CP1	201	1.00	5.00	3.4975	1.06360	-0.699	0.172	0.026	0.341
CP2	201	1.00	5.00	3.4776	0.94908	-0.485	0.172	-0.038	0.341
CP3	201	1.00	5.00	3.4677	0.95927	-0.508	0.172	-0.131	0.341
CP4	201	1.00	5.00	3.4925	1.07759	-0.598	0.172	-0.176	0.341
IP1	201	1.00	5.00	3.6468	1.06752	-0.750	0.172	0.065	0.341
IP2	201	1.00	5.00	3.7512	1.08987	-0.779	0.172	0.016	0.341
IP3	201	1.00	5.00	3.6567	1.04717	-0.805	0.172	0.253	0.341
IP4	201	1.00	5.00	3.4826	1.03486	-0.637	0.172	-0.007	0.341
LG1	201	1.00	5.00	3.6716	1.23760	-0.760	0.172	-0.373	0.341
LG2	201	1.00	5.00	3.7711	1.16506	-0.962	0.172	0.222	0.341
LG3	201	1.00	5.00	3.7264	1.11792	-0.744	0.172	-0.201	0.341
LG4	201	1.00	5.00	3.5224	1.29644	-0.516	0.172	-0.809	0.341
Valid N (listwise)	201								

4.3.5 Testing for Linearity

To check for linearity, this study used residual scatter plot. If the assumptions are satisfied, the residuals should scatter around 0, or most of the scores should concentrate in the centre at the 0 point (Flury & Riedwyl, 1988). Figure 4.1 displays

the scatter plot between MIS indicators and organizational performance. The plot shows that the residual scores were concentrated at the centre along the zero (0) point, thereby suggesting that the linearity assumption was met. Similarly, it appears that the other variables also demonstrate that the linearity assumption was not violated (Appendix C)
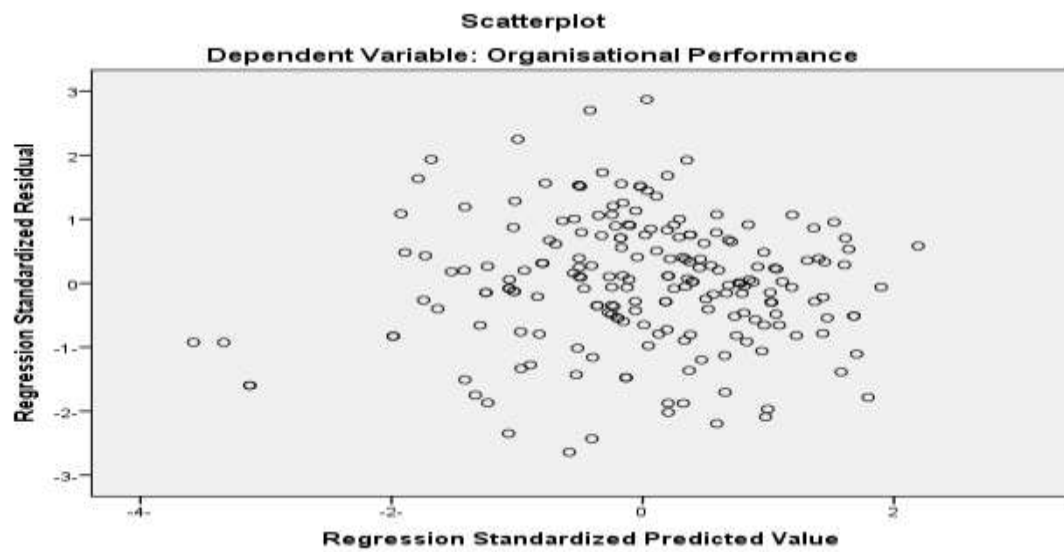
Figure 4.1. Scatter Plots of Organizational Performance With All Independent Constructs.
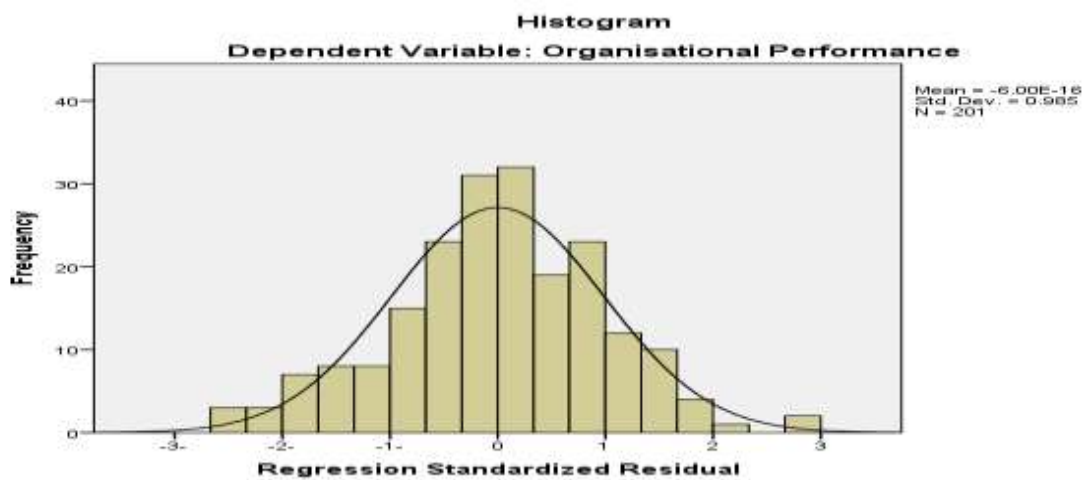
Figure 4.2. Regression Standardized Residual of Independent and Organizational Performance.
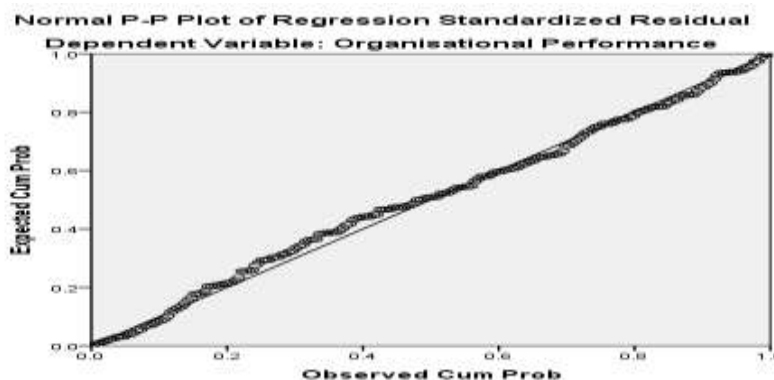
Figure 4.3. Normal P-P Plots of Regression Standardized Residual of Organizational Performance.

4.3.6 Testing for Multicollinearity

Multicollinearity is defined as the degree of correlation among independent variables (Hair et al., 2010). Multicollinearity is checked using the Variance Inflation Factor (VIF) and tolerance level (Pallant, 2007). To test for multicollinearity, researchers used SPSS for collinearity diagnostics. In the collinearity diagnostics, VIF and Tolerance values were compared with the standard values. The tolerance values indicate the percentage of variation not explained by the independent variables together in the model. According to Pallant (2007), the VIF value above 5 signals the existence of multicollinearity. Meanwhile, tolerance values less than 0.10 show the existence of multicollinearity in data (Field, 2013).

Table 4.5 shows the VIF and tolerance values for the current study. It is evident from the values that no issues of multicollinearity exist in the data as all values for VIF were less than 5 and tolerance was above than 0.10. This reflects no violation of multicollinearity assumptions.

Table 4.5

Multicollinearity Assessment

		Collinearity Statistics	
	Model	Tolerance	VIF
1	(Constant)		
	System Quality	0.519	1.925
	Information Quality	0.446	2.243
	Service Quality	0.614	1.629
	Use of System	0.580	1.725
	User Satisfaction	0.473	2.114
	Net Benefits	0.558	1.793
	Total Quality Management	0.370	2.702
a. Dependent Variable: Organizational Performance			

4.3.7 Testing for Common Method Bias

In self-report studies, one of the major issues regarding measurement validity is common method bias. Common method bias typically occurs since the key informant approach is utilised to gain measurement scores for all constructs (Asiaei, 2014). Common method bias is defined as a variance that is attributed to the measurement method rather than to the constructs the measures represent (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). As this study adopted self-reported measures, it is exposed to the common method variance.

Thus, in the current study, the researcher used the single-factor method for common method variance. In order to avoid the common method variance and its effect on the validity and reliability of the data is to apply SPSS using factor analysis to test for common method variance. Items of all the constructs were loaded onto the

single factor to test the variation produced by these items in a common factor. Variation in the single factor less than 50% explains the non-presence of the common method variance in the data (Hair et al., 2010). The results of the current study are presented in Table 4.6. It indicated that, overall, 28.655% of the common variation exists in the data. Thus, no issue of common method variance was found in the data as this value is below 50% as shown in Table 4.6.

Table 4.6

Result of Common Method Bias Test

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	18.339	28.655	28.655	18.339	28.655	28.655
2	4.288	6.700	35.355			
3	2.448	3.825	39.180			
4	2.360	3.688	42.868			
5	2.154	3.366	46.234			
6	2.001	3.126	49.360			
7	1.804	2.819	52.179			
8	1.755	2.742	54.921			
9	1.625	2.540	57.461			
10	1.420	2.219	59.680			
11	1.390	2.172	61.853			
12	1.324	2.068	63.921			
13	1.153	1.802	65.723			
14	1.141	1.783	67.506			
15	1.080	1.688	69.194			
16	1.033	1.614	70.808			
17	0.965	1.508	72.316			
18	0.903	1.411	73.727			
19	0.868	1.356	75.083			
20	0.819	1.280	76.363			
21	0.802	1.253	77.616			
22	0.748	1.169	78.785			
23	0.720	1.126	79.911			
24	0.715	1.117	81.028			
25	0.688	1.075	82.103			

26	0.632	0.988	83.091
27	0.612	0.957	84.048
28	0.566	0.885	84.933
29	0.555	0.867	85.800
30	0.545	0.851	86.651
31	0.527	0.824	87.475
32	0.493	0.771	88.246
33	0.458	0.715	88.961
34	0.437	0.682	89.643
35	0.412	0.644	90.287
36	0.396	0.618	90.906
37	0.391	0.611	91.517
38	0.365	0.571	92.088
39	0.360	0.562	92.650
40	0.332	0.519	93.169
41	0.312	0.488	93.656
42	0.310	0.485	94.141
43	0.296	0.463	94.604
44	0.276	0.432	95.035
45	0.257	0.402	95.438
46	0.251	0.392	95.829
47	0.234	0.365	96.194
48	0.228	0.357	96.551
49	0.217	0.339	96.890
50	0.210	0.328	97.219
51	0.198	0.309	97.528
52	0.184	0.288	97.816
53	0.179	0.279	98.095
54	0.159	0.249	98.344
55	0.153	0.239	98.583
56	0.145	0.227	98.810
57	0.133	0.208	99.018
58	0.122	0.190	99.209
59	0.115	0.180	99.389
60	0.103	0.161	99.550
61	0.096	0.149	99.700
62	0.085	0.132	99.832
63	0.068	0.106	99.938
64	0.040	0.062	100.000

4.4 Demographic Profile of Respondents

The employee profile of the 201 respondents is illustrated in Table 4.7. It shows that there are more male employees (77.1%) than females (22.9%). In terms of age, 58.2% of the total respondents are aged below 30 years, followed by (29.4%) aged 31-40 years, (10.9%) aged 41-50 years and (1.5%) above 50 years. The majority of the respondents (60.7%) are Bachelor degree holders, (29.1%) have professional qualifications, (39.3%) are Baccalaureate/Diploma holders and (3%) are master holders, and no one holds a PhD. In terms of experience, of the total respondents have less than five years of working experience in the present organization, the other experienced groups are distributed as follows: 6-10 (27.3%), 11-15 (19.9), 16-20 (9.5), and above 20 years (4%). As for the job positions of respondents, (74.1%) are managers of a unit or section, (20.9%) are department managers, and the remaining (5%) are senior managers such as general managers and directors. In terms of the duration of the job position, the majority (58.6%) have experience between 1-5 years, followed by (29.4%) with 6-10 years experience and (17%) have more than 10 years.

Table 4.7

Demographic Profile of Respondents

Profile	Categories	Frequency	Percent
Gender	Male	155	77.1
	Female	46	22.9
Age	Below 30 Years	117	58.2
	31-40 Years	59	29.4
	41-50 Years	22	10.9
	Above 50 Years	3	1.5
Education	Baccalaureate / Diploma	73	36.3
	Bachelor Degree/Professional Qualification	122	60.7
	Master Degree	6	3
	PhD Degree	0	0
Experience	Less than 5 Years	79	39.3
	6 - 10 Years	55	27.3
	11 - 15 Years	40	19.9
	61 - 20 Years	19	9.5
	Above 20 Years	8	4
Level of job position	Manager of Unit or Section	149	74.1
	Manager of Department	42	20.9
	General Manager/ Deputy General Manager / Manager of Division	10	5
Duration of the job position	Less than 2 Years	59	29.3
	3 - 5 Years	59	29.3
	6 - 10 Years	49	24.4
	Above 10 Years	34	17

4.5 Descriptive Statistics Analysis

In order to understand the overall scenario of this study that investigates the relationship between MIS indicators and organizational performance with the mediating role of TQM, descriptive analysis was conducted to describe all the constructs. Table 4.8 shows the mean, standard deviation, maximum, minimum and variance values of the constructs.

System quality has a mean value of 3.43 with a standard deviation of 0.72 and a variance of 0.519. Information quality has a mean value of 3.49 with a standard deviation of 0.70 and a variance of 0.501. Service quality has a mean value of 3.51 with a standard deviation of 0.59 and a variance of 0.348. Use of system has a mean value of 3.70 with a standard deviation of 0.70 and a variance of 0.492. User satisfaction has a mean value of 3.49 with a standard deviation of 0.73 and a variance of 0.547. Net benefits has a mean value of 3.76 with a standard deviation of 0.76 and a variance of 0.591 and TQM has a mean value of 3.48 with a standard deviation of 0.65 and a variance of 0.430, while organizational performance has a mean value of 3.59 with a standard deviation of 0.68 and variance of 0.463.

Table 4.8

Descriptive Statistics

Constructs	N	Minimum	Maximum	Mean	Std. Deviation	Variance
System Quality	201	1.00	5.00	3.4391	0.72047	0.519
Information Quality	201	1.00	5.00	3.4975	0.70754	0.501
Service Quality	201	1.75	5.00	3.5112	0.59018	0.348
Use of System	201	1.00	5.00	3.7027	0.70107	0.492
User Satisfaction	201	1.25	5.00	3.4988	0.73972	0.547
Net Benefits	201	1.00	5.00	3.7699	0.76867	0.591
TQM	201	1.29	5.00	3.4859	0.65588	0.430
Organizational Performance	201	1.25	5.00	3.5942	0.68022	0.463

4.6 Confirmatory Factor Analysis

According to Anderson and Gerbing (1988), the CFA model recognises the relationship between the observed variables and the fundamental constructs with factors allowed to inter-correlate freely. As a step required in testing the conceptual models, the suitability of the computed variables must be assessed. CFA was conducted on each of the variables using AMOS 21.

The results of the CFA indicated that all of the values are within the acceptable ranges except the standard errors (Byrne, 2001). The factor structure of each model fits the data and all fit indices met the respective criteria with $\chi2$=Chi-square; DF= Degree of Freedom; CMIN= Minimum Chi-square; CFI = Comparative Fit Index; TLI= Tucker Lewis; RMR= Root Mean Square Residual; RMSEA= Root Mean Square Error of Approximation and SRMR=Standardized Root Mean Square

Residual. The criteria for eliminating the items were set based on the factor loadings and the residual values of each item. The factor loadings >0.50 was selected to retain the items.

4.6.1 CFA for Management Information System

The researcher used 24 items to measure the construct MIS based on six dimensions each one of them has four items as first-order constructs. CFA was conducted in order to validate the unidimensionality of the constructs. Figure 4.4 shows the CFA of MIS.
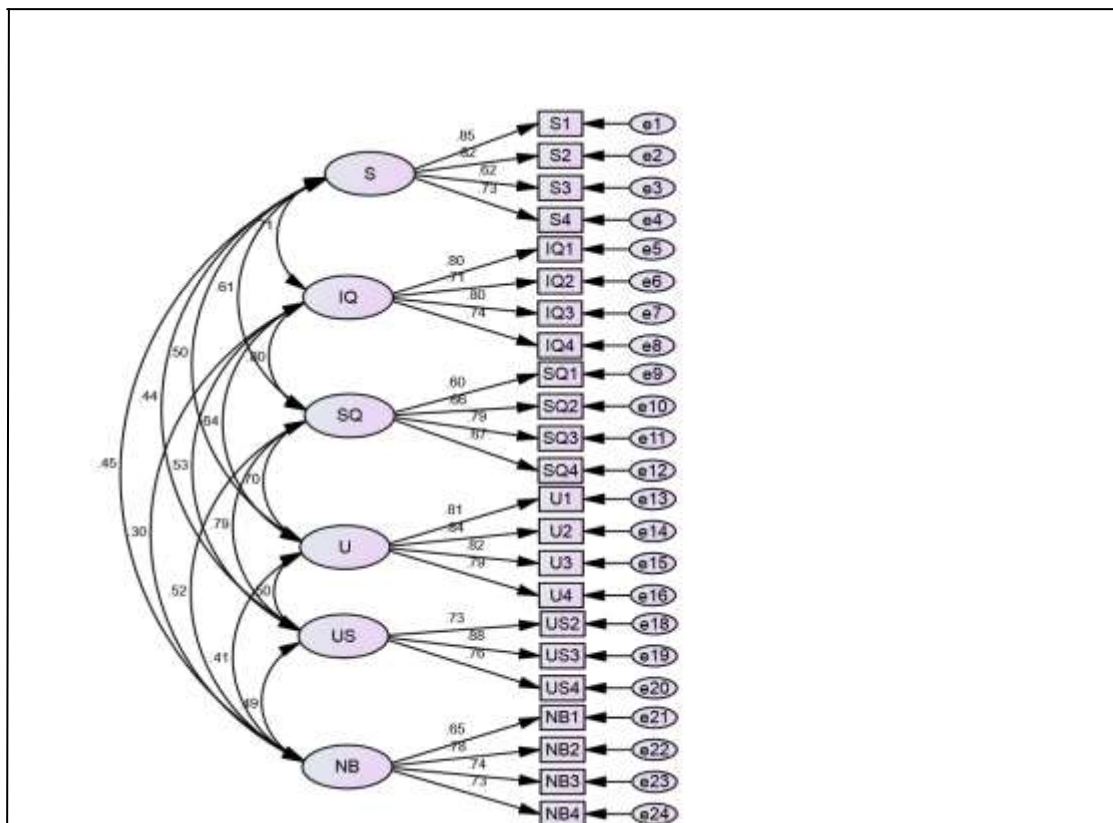

Figure 4.4. CFA for MIS

Initial results indicated that item US1 showed a low factor loading of 0.50 as this item was removed from the analysis. Table 4.9 shows that the model fitness was fit to proceed further. A value of CMIN/DF was 1.921, CFI was 0.919, TLI was 0.905, RMR was 0.053, RMSEA was 0.068 and SRMR was 0.0457. These values indicated a good model fit for the construct of MIS.

Table 4.9

Fitness Indices for MIS

Model Fit Table	Acceptable Range	Values
CMIN/DF	<5	1.921
CFI	>0.90	0.919
TLI	>0.90	0.905
RMR	<0.8	0.053
RMSEA	<0.8	0.068
SRMR	<0.8	0.0457

4.6.2 CFA for Total Quality Management

The researcher used 24 items to measure the TQM construct based on six dimensions, with each consisting of four items as second-order constructs. CFA was conducted in order to validate the unidimensionality of the constructs. Figure 4.5 shows the CFA of TQM.
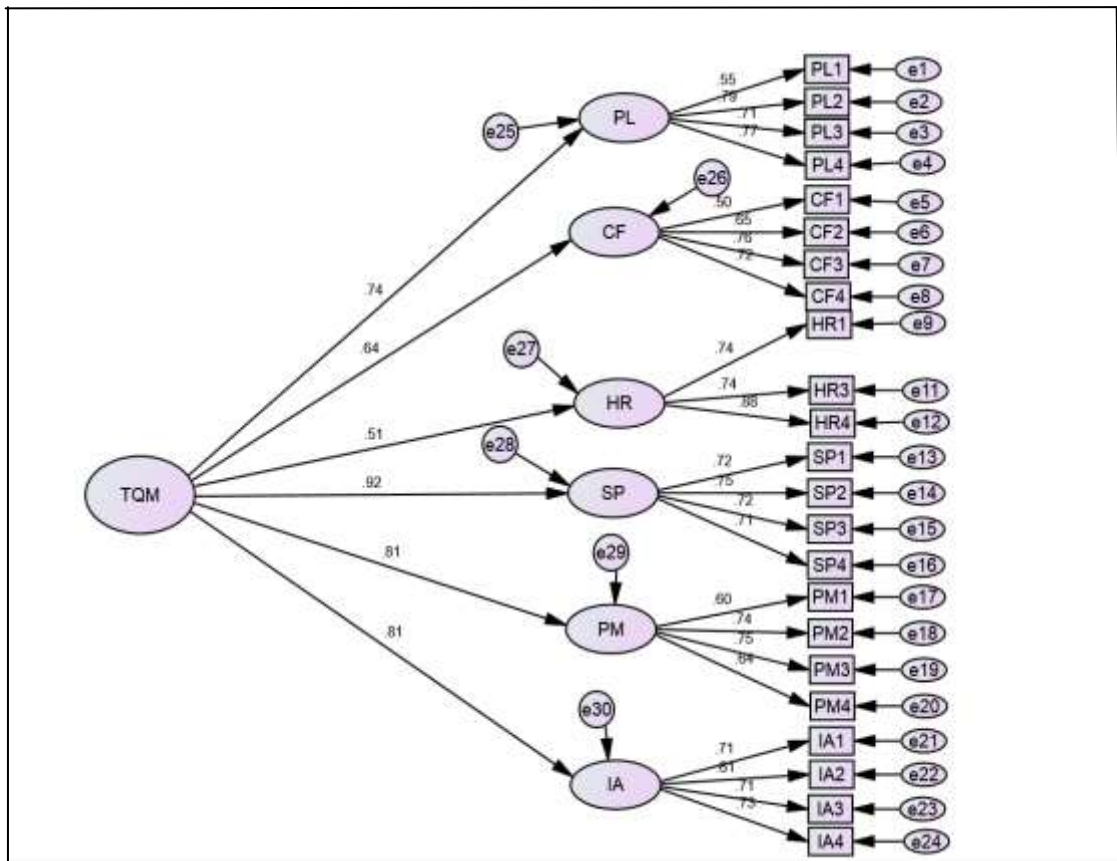
Figure 4.5. CFA for TQM

Initial results indicated that item HR2 showed a low factor loading of 0.50 as this item was removed from the analysis. Table 4.10 shows that the model fitness was fit to proceed further. A value of CMIN/DF was 1.707, CFI was 0.915, TLI was 0.904, RMR was 0.070, RMSEA was 0.059 and SRMR was 0.0604. These values indicated a good model fit of TQM.

Table 4.10

Fitness Indices for TQM

Model Fit Table	Acceptable Range	Values
CMIN/DF	<5	1.707
CFI	>0.90	0.915
TLI	>0.90	0.904
RMR	<0.8	0.070
RMSEA	<0.8	0.059
SRMR	<0.8	0.0604

4.6.3 CFA for Organizational Performance

The researcher used 16 items to measure the construct organizational performance based on four dimensions with each consisting of four items as second-order constructs. CFA was conducted in order to validate the unidimensionality of the constructs. Figure 4.6 shows the CFA of organizational performance.
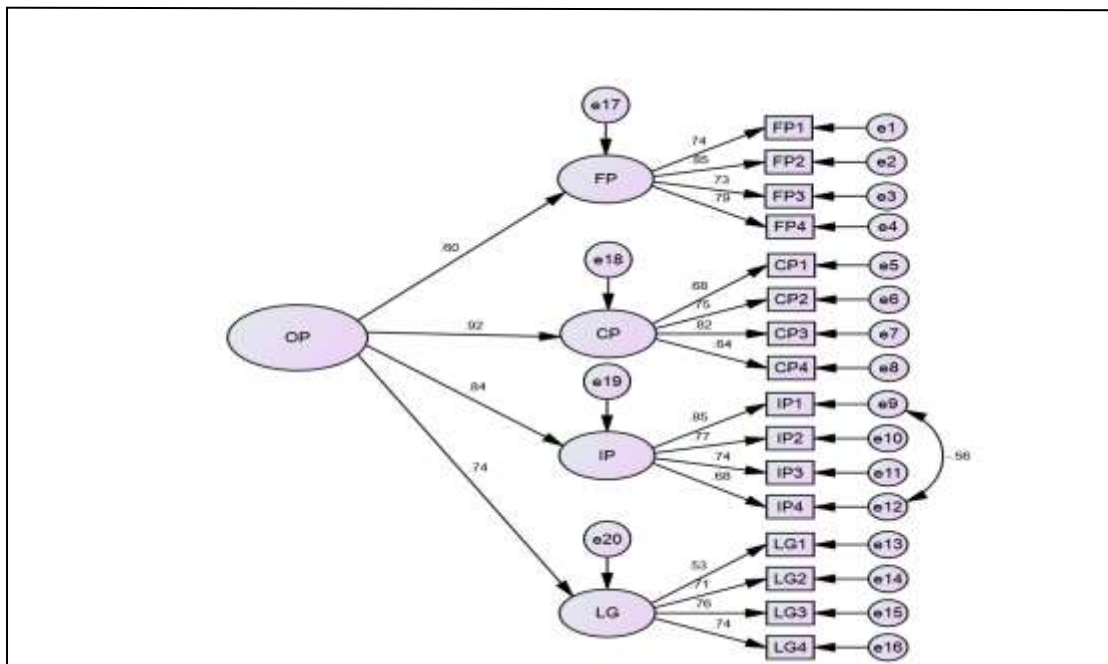

Figure 4.6. CFA for Organizational Performance

Initial results indicated that although all factor loadings are above than 0.50, there are relatively low values for fitness indices, as shown in Table 4.12. The initial value for the TLI was 0.892. This value showed that the model was not fit to proceed further. Thus, to establish model fitness, the researcher used the process prescribed by Hair et al. (2013) to correlate the error terms having the highest modification indices value. Table 4.11 shows the modifications of indices values for the CFA.

Table 4.11

Modification indices for Organizational Performance

Bath			M.I.	Par Change
e8	<-->	e18	5.129	-.078
e8	<-->	e17	5.931	.120
e8	<-->	e16	4.105	.122
e4	<-->	e16	5.563	.146
e15	<-->	e8	9.661	-.158
e14	<-->	e18	4.199	-.074
e14	<-->	e16	5.112	-.137
e13	<-->	e15	4.345	-.131
e13	<-->	e14	10.502	.222
e12	<-->	F5	5.969	.088
e12	<-->	e19	18.308	-.184
e12	<-->	e18	28.317	.186
e12	<-->	e16	7.578	.166
e12	<-->	e8	8.717	.158

Bath			M.I.	Par Change
e12	<-->	e15	5.277	-.116
e11	<-->	e14	4.459	.099
e10	<-->	e12	4.610	-.095
e9	<-->	e8	4.102	-.089
e9	<-->	e12	14.414	-.164
e9	<-->	e10	7.107	.093
e7	<-->	e15	10.485	.123
e6	<-->	e12	4.609	.091
e5	<-->	e11	7.702	-.120
e3	<-->	e8	9.041	.173
e3	<-->	e14	6.174	.147

On the basis of the above-mentioned Table 4.11, e9 ⟷ e12 was correlated as shown in Figure 4.6. Table 4.12 shows that the model fitness was achieved with these modifications. A value of CMIN/DF was 2.133, CFI was 0.925, TLI was 0.909, RMR was 0.079, RMSEA was 0.075 and SRMR was 0.0603. These values indicated a good model fit for the construct of organizational performance.

Table 4.12

Fitness Indices for Organizational Performance

Model Fit Table	Acceptable Range	Initial values	Values after modification
CMIN/DF	<5	2.348	2.133
CFI	>0.90	0.910	0.925
TLI	>0.90	0.892	0.909
RMR	<0.8	0.085	0.079
RMSEA	<0.8	0.082	0.075
SRMR	<0.8	0.0671	0.0603

4.7 Measurement Model

In the current study, SEM is used to test the measurement and structural model using AMOS 21. As a step required in testing the relationship of the manifest item with their respective latent constructs, CFA was conducted as recommended by Hair et al. (2010). The results indicated that all the values are within the acceptable ranges except the standard errors (Byrne, 2001). Table 4.20 shows the threshold values for model fit in SEM.

Table 4.13

Threshold Values

Model Fit Table	Acceptable Range
CMIN/DF	<5
CFI	>0.90
TLI	>0.90
RMR	<0.8
RMSEA	<0.8
SRMR	<0.8

Note, χ2 =Chi-square; DF= Degree of Freedom; Minimum Chi-square; CFI= Comparative Fit Index; TLI= Tucker Lewis; RMR= Root Mean Square Residual; RMSEA= Root Mean Square Error of Approximation and SRMR=Standardized Root Mean Square Residual.

Adoption from Hair, Black, Babin, & Anderson, 2010.

In the measurement model, all the items which have been confirmed through CFA were tested further to check whether the confirmed items of the constructs contribute significantly to the proposed model. In CFA, all the constructs were tested individually with their items. The researcher tested the measurement model in two stages. In the first stage, all measurement models were investigated individually with the latent constructs of system quality, information quality, service quality, use of system, user satisfaction, net benefits, TQM and organizational performance. The results suggested that items SQ3, SQ4, US1, NB4, CF1, HR2, PM1, IA2, CP1, CP4, IP2, IP4 and LG1 showed a low factor loading. These factors were removed from the analysis. In the next stage, all measurement models were tested together to check the model fitness and validity and reliability issues. Figure 4.14 showed the results for CFA.
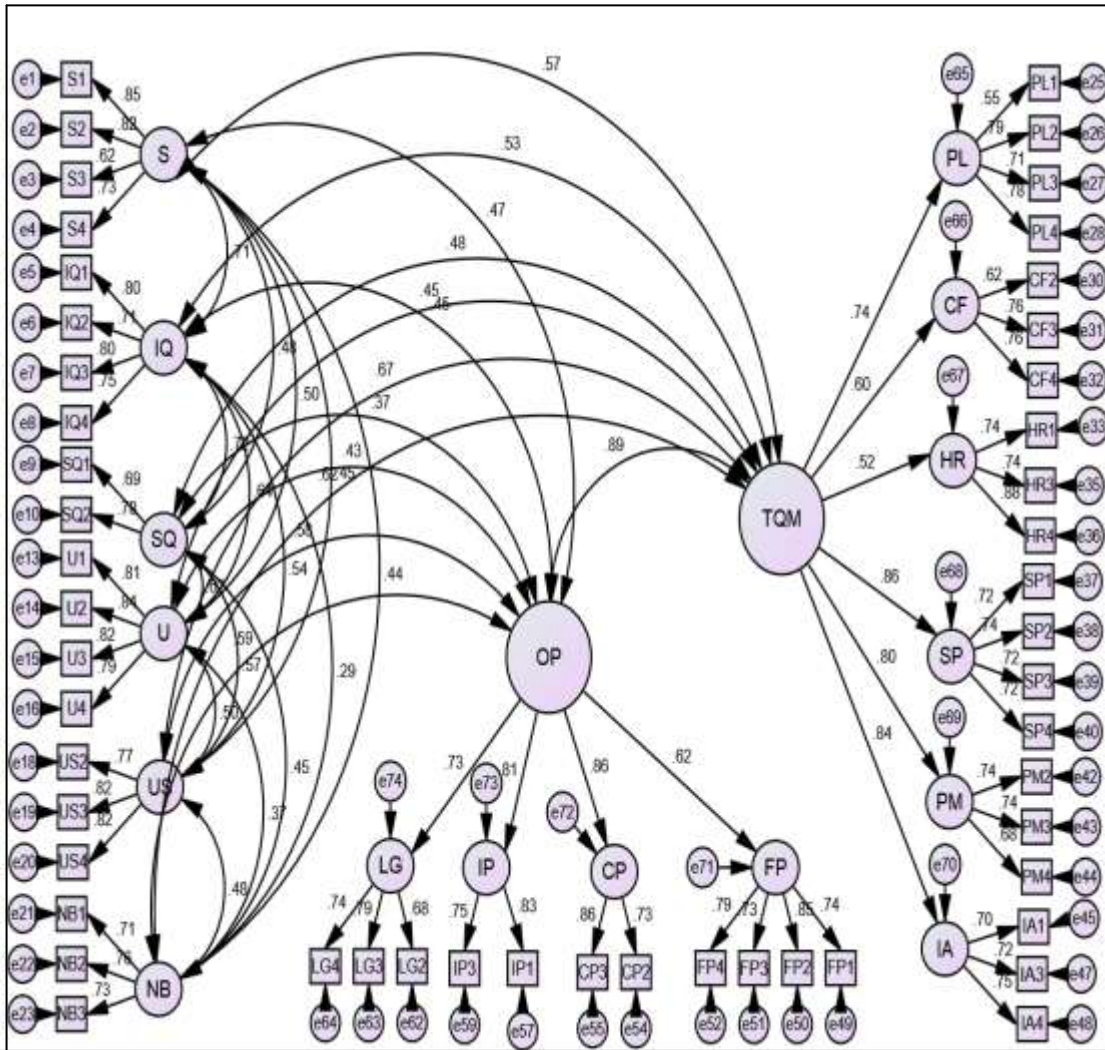
Figure 4.7. Overall Measurement Models of All Constructs.

Table 4.14

Overall Measurement Model of All Constructs

Statistics	Fit Indices	Level of Acceptance	Obtained Model fitness value
Absolute Fit	χ2	P>0.05	1646.647
	DF		1186
	CMIN/DF	<5	1.388
	RMSEA	<0.8	0.044
	SRMR	<0.8	0.0539
Incremental Fit	CFI	>0.90	0.909
	TLI	>0.90	0.903
Parsimony Fit	RMR	<0.8	0.067

CMIN/DF =Normed Chi-Square; χ2 =Chi-square; DF= Degree of Freedom; Minimum Chi-square; CFI= Comparative Fit Index; TLI= Tucker Lewis; RMR= Root Mean Square Residual; RMSEA= Root Mean Square Error of Approximation and SRMR=Standardized Root Mean Square Residual.

4.7.1 Convergent Validity

Convergent validity is described as the level to which many of the items measuring the same concept are in agreement (Ramayah, Lee, & Chyaw, 2011). As suggested by Hair et al. (2010), the convergent validity of the construct can be assessed using item loadings, AVE and Composite Reliabilities (CR) of the construct.

All the item loadings should be over the recommended value of 0.50 (Fornell & Larcker, 1981). The AVE of every construct should be above 0.50 based on Kline (2011). In addition, CR values reflect the level to which the construct indicators reveal the latent variable and they should be greater than 0.70, as recommended by Cooper & Schindler (2013).

As the first step of testing the convergent validity, the researcher tested the item loadings of the constructs. As a required condition, all items should be significantly related to their respective latent construct. Table 4.15 shows that all items were significantly loaded to their respective latent construct as the factor loading was above 0.50. These items will be retained for further analysis.

Table 4.15

Predictive Validity (Factor loadings)

	Bath		**Estimate**
S4	<---	System Quality	0.726
S3	<---	System Quality	0.620
S2	<---	System Quality	0.816
S1	<---	System Quality	0.855
IQ4	<---	Information Quality	0.746
IQ3	<---	Information Quality	0.800
IQ2	<---	Information Quality	0.709
IQ1	<---	Information Quality	0.797
SQ2	<---	Service Quality	0.784
SQ1	<---	Service Quality	0.692
U4	<---	Use of System	0.791
U3	<---	Use of System	0.822
U2	<---	Use of System	0.841
U1	<---	Use of System	0.814
US4	<---	User Satisfaction	0.816
US3	<---	User Satisfaction	0.819
US2	<---	User Satisfaction	0.766
NB3	<---	Net Benefits	0.732
NB2	<---	Net Benefits	0.758
NB1	<---	Net Benefits	0.714
PL4	<---	Leadership	0.775
PL3	<---	Leadership	0.710
PL2	<---	Leadership	0.793
PL1	<---	Leadership	0.546
CF4	<---	Customer Focus	0.764
CF3	<---	Customer Focus	0.759
CF2	<---	Customer Focus	0.623
HR4	<---	Human Resource	0.880

Bath			Estimate
HR3	<---	Human Resource	0.741
HR1	<---	Human Resource	0.745
SP4	<---	Strategic Planning	0.717
SP3	<---	Strategic Planning	0.721
SP2	<---	Strategic Planning	0.738
SP1	<---	Strategic Planning	0.720
PM4	<---	Process Management	0.675
PM3	<---	Process Management	0.742
PM2	<---	Process Management	0.738
IA4	<---	Information & Analysis	0.749
IA3	<---	Information & Analysis	0.717
IA1	<---	Information & Analysis	0.697
FP4	<---	Financial Perspective	0.793
FP3	<---	Financial Perspective	0.728
FP2	<---	Financial Perspective	0.847
FP1	<---	Financial Perspective	0.741
CP3	<---	Customer Perspective	0.861
CP2	<---	Customer Perspective	0.734
IP3	<---	Internal Perspective	0.749
IP1	<---	Internal Perspective	0.828
LG4	<---	Learning Perspective	0.744
LG3	<---	Learning Perspective	0.792
LG2	<---	Learning Perspective	0.678

AMOS 21 software is not able to compute AVE directly. Therefore, AVE for the current study was calculated using Microsoft Excel macros. Table 4.16 shows the AVE of each construct. These values indicated that all the constructs have AVE more than 0.50 which indicates all the constructs have adequate convergent validity.

Similar to AVE, the CR was also derived from Microsoft Excel macros. Table 4.16 shows the value of CR for each construct involved in the current study. These values indicated that all the constructs have sufficient reliability ranging from 0.706 to 0.889 as they are greater than 0.70. Therefore, the current study does not violate the convergent validity of the constructs.

Table 4.16

Convergent Validity Analysis

Constructs	AVE	CR
System Quality	0.577	0.843
Information Quality	0.583	0.848
Service Quality	0.546	0.706
Use of System	0.667	0.889
User Satisfaction	0.641	0.842
Net Benefits	0.540	0.778
TQM	0.544	0.874
Organizational Performance	0.578	0.843

4.7.2 Discriminant Validity

Discriminant validity is defined as the degree to which the items of the latent construct are truly distinct from items of all other latent constructs (Arbuckle, 2011; Hair et al., 2010). There are numerous approaches to establishing discriminant validity. The first criterion indicates that the value of inter-construct correlation should be less than 0.85 in order to establish the discriminant validity (Cooper & Schindler, 2013). A second criterion to assess the discriminant validity is that the square root of AVE should be higher than all inter-construct correlations of the respective construct (Fornell & Larcker, 1981). Table 4.17 represents the squared inter-construct correlation of each variable and average variance extraction. The results indicate that all the constructs have adequate discriminant validity as the square root of AVE is greater than the inter-construct correlation of each variable and the values of inter construct are less than 0.85. It means the results provide sufficient evidence of discriminant validity of the constructs.

Table 4.17

Discriminant Validity Analysis

Variables	SQ	IQ	SQ	U	US	NB	TQM	OP
System Quality	**0.759***							
Information Quality	0.709	**0.763***						
Service Quality	0.483	0.723	**0.739***					
Use of System	0.498	0.643	0.622	**0.817***				
User Satisfaction	0.451	0.538	0.571	0.499	**0.800***			
Net Benefits	0.438	0.293	0.449	0.371	0.483	**0.734***		
TQM	0.574	0.529	0.483	0.454	0.668	0.622	**0.737***	
Organizational Performance	0.466	0.455	0.371	0.426	0.582	0.587	0.693	**0.760***

*Diagonal shows the square root of AVE.

4.8 Structural Model (Hypothesis Testing)

In the current study, SEM is used to present a path analysis of exogenous and endogenous variables through AMOS 21. Figure 4.8 presents the relationship between MIS, TQM and organizational performance to examine whether there is a statistically significant relationship or not. Each path shows the total variation explained in the endogenous variable with respect to exogenous variables. The results show that the significant model fit Chi-square for this model is $\chi2= 1.818$, DF $= 1$, RMR$= 0.024$ it must be near to 0, SRMR$=0.0235$ it must be near 0, TLI$=0.947$ which is near 1,

CFI=0.998 is also near 1 shows perfect fit, RMSEA=0.064 from 0.05 to 0.08 shows
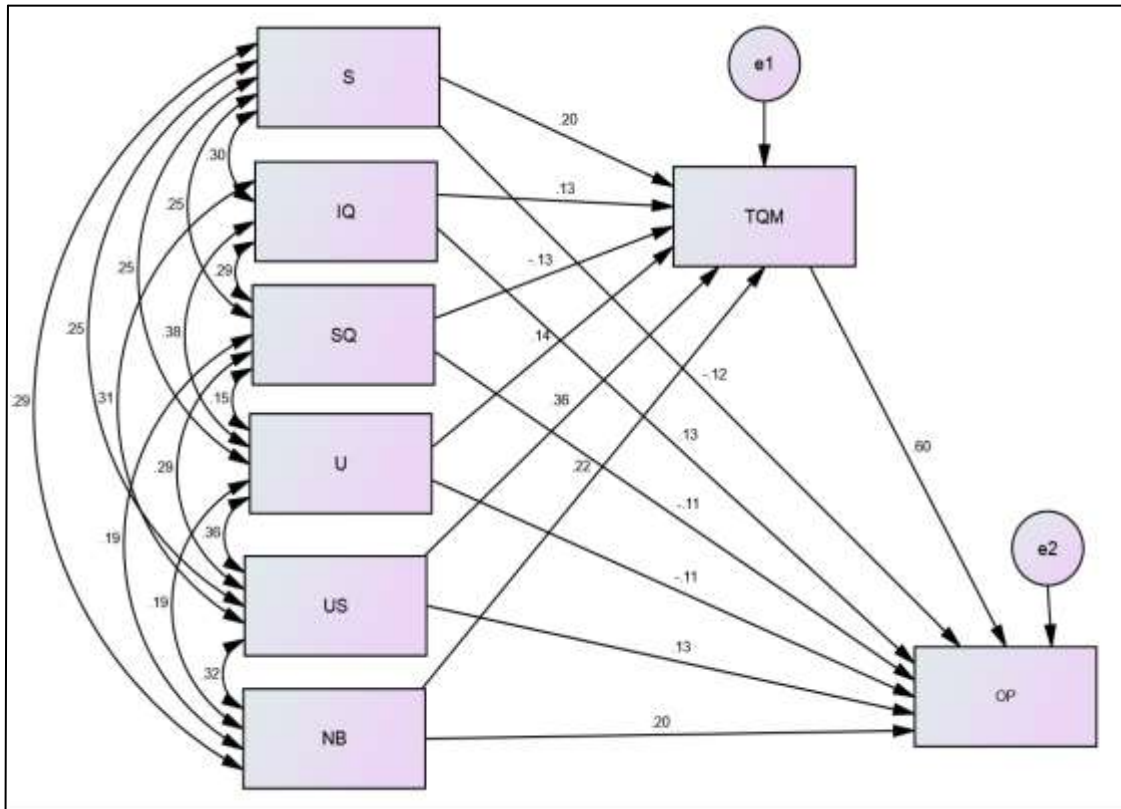
modesty in the model.

Figure 4.8. Path Analysis for Data.

The researcher aims to answer the four main research questions to achieve the

objectives of the current study. The first research objective was to examine the

relationship between MIS indicators (system quality, information quality, service

quality, use of system, user satisfaction and net benefits) and organizational

performance. To achieve this objective, the researcher proposed six hypotheses. The

first hypothesis states that H1: System quality is positively related to organizational

performance. Table 4.18 shows that path H1: System quality➔Organizational

performance has an unstandardized estimate of - 0.086, standardized path coefficient

of -0.12, standard error of 0.040, and the critical ratio was -2.134. The hypothesis was established to test the positive relationship. For this reason, H1 has been rejected and the study established a negative relationship between system quality and organizational performance.

Table 4.18

Hypothesis Results (Direct Relationship MIS Indicters with OP)

Path		Estimate	S.E.	C.R.	P	S. Reg. Weights	Label
OP <---	S	-0.086	0.040	-2.134	0.033	-0.12	Not Supported
OP <---	IQ	0.090	0.040	2.280	0.023	0.13	Supported
OP <---	SQ	-0.072	0.036	-1.980	0.048	-0.11	Not Supported
OP <---	U	-0.073	0.037	-2.001	0.045	-0.11	Not Supported
OP <---	US	0.098	0.048	2.040	0.041	0.13	Supported
OP <---	NB	0.175	0.050	3.506	***	0.20	Supported

The second hypothesis states that H2: Information quality is positively related to organizational performance. Table 4.18 shows that path H2: Information quality➔ Organizational performance have an unstandardized estimate of 0.090, standardized path coefficient of 0.13, standard error of 0.040, and the critical ratio was 2.280 with a p-value of 0.023, which is less than 0.05. This provides sufficient evidence to accept the research hypothesis. Thus, H2 was accepted. The study established a direct relationship between information quality and organizational performance.

The third hypothesis states that H3: Service quality is positively related to organizational performance. Table 4.18 shows that path H3: Service quality➔ Organizational performance has an unstandardized estimate of - 0.072, standardized path coefficient of -0.11, standard error of 0.036, and the critical ratio was -1.980. The hypothesis was established to test the positive relationship. For this reason, H3 has been rejected and the study established a negative relationship between service quality and organizational performance.

The fourth hypothesis states that H4: Use of MIS is positively related to organizational performance. Table 4.18 shows that path H4: Use of system ➔Organizational performance has an unstandardized estimate of - 0.073, standardized path coefficient of -0.11, standard error of 0.037, and the critical ratio was -2.001. The hypothesis was established to test the positive relationship. For this reason, H4 has been rejected and the study established a negative relationship between use of system and organizational performance.

The fifth hypothesis states that H5: User satisfaction is positively related to organizational performance. Table 4.18 shows that path H5: User satisfaction➔ Organizational performance has an unstandardized estimate of 0.098, standardized path coefficient of 0.13, standard error of 0.048, and the critical ratio was 2.040 with a p-value of 0.041, which is less than 0.05. This provides sufficient evidence to accept the research hypothesis. Thus, H5 was accepted. The study established a direct relationship between user satisfaction and organizational performance.

The sixth hypothesis states that H6: Net benefits are positively related to organizational performance. Table 4.18 shows that path H6: Net benefits➔ Organizational performance has an unstandardized estimate of 0.175, standardized path coefficient of 0.20, standard error of 0.050, and the critical ratio was 3.506 with a p-value of 0.000, which is less than 0.05. This provides sufficient evidence to accept the research hypothesis. Thus, H6 was accepted. The study established a direct relationship between net benefits and organizational performance.

The first objective of the study was also aimed to identify the most effective MIS indicators in organizational performance. Thus, it can be seen from Table 4.18 that net benefits have a higher value of standardized regression weights. The value 0.20 is above the rest of the values, thus it can be concluded that net benefits are the most influential dimension of the MIS indicators that influence organizational performance.

The second research objective was to examine the relationship between MIS indicators (system quality, information quality, service quality, use of system, user satisfaction and net benefits) and TQM. To achieve this objective, the researcher proposed six hypotheses. First hypothesis states that H7: System quality is positively related to TQM. Table 4.19 shows that path H7: System quality➔TQM have an unstandardized estimate of 0.118, standardized path coefficient of 0.20, standard error of 0.035, and the critical ratio was 3.373 with a p-value of 0.000, which is less than 0.05. This provides enough evidence to accept the research hypothesis. Thus, H7 was accepted. The study established a direct relationship between system quality and TQM.

Table 4.19

Hypothesis Results (Direct Relationship MIS Indicters with TQM)

Path			Estimate	S.E.	C.R.	P	S. Reg. Weights	Label
TQM	<---	S	0.118	0.035	3.373	***	0.20	Supported
TQM	<---	IQ	0.073	0.035	2.087	0.037	0.13	Supported
TQM	<---	SQ	-0.073	0.032	-2.292	0.022	-0.13	Not Supported
TQM	<---	U	0.076	0.032	2.372	0.018	0.14	Supported
TQM	<---	US	0.233	0.039	5.920	***	0.36	Supported
TQM	<---	NB	0.163	0.043	3.821	***	0.22	Supported
OP	<---	TQM	0.729	0.079	9.171	***	0.60	Supported

The second hypothesis states that H8: Information quality is positively related to TQM. Table 4.19 shows that path H8: Information quality➔TQM have an unstandardized estimate of 0.073, standardized path coefficient of 0.13, standard error of 0.035, and the critical ratio was 2.087 with a p-value of 0.037, which is less than 0.05. This provides sufficient evidence to accept the research hypothesis. Thus, H8 was accepted. The study established a direct relationship between information quality and TQM.

The third hypothesis states that H9: Service quality is positively related to TQM. Table 4.19 shows that path H9: Service quality➔TQM has an unstandardized estimate of -0.073, standardized path coefficient of -0.13, standard error of 0.032, and the critical ratio was -2.292. The hypothesis was established to test the positive relationship. For this reason, the H9 has been rejected and the study established a negative relationship between service quality and TQM.

The fourth hypothesis states that H10: Use of MIS is positively related to TQM. Table 4.19 shows that path H10: Use of system➔TQM has an unstandardized estimate of 0.076, standardized path coefficient of 0.14, standard error of 0.032, and the critical ratio was 2.372 with a p-value of 0.018, which is less than 0.05. This provides sufficient evidence to accept the research hypothesis. Thus, H10 was accepted. The study established a direct relationship between use of system and TQM.

The fifth hypothesis states that H11: User satisfaction is positively related to TQM. Table 4.19 shows that path H11: User satisfaction➔TQM has an unstandardized estimate of 0.233, standardized path coefficient of 0.36, standard error of 0.039, and the critical ratio was 5.920 with a p-value of 0.000, which is less than 0.05. This provides sufficient evidence to accept the research hypothesis. Thus, H11 was accepted. The study established a direct relationship between user satisfaction and TQM.

The sixth hypothesis states that H12: Net benefits are positively related to TQM. Table 4.19 shows that path H12: Net benefits➔TQM has an unstandardized estimate of 0.163, standardized path coefficient of 0.22, standard error of 0.043, and the critical ratio was 3.821 with a p-value of 0.000, which is less than 0.05. This provides sufficient evidence to accept the research hypothesis. Thus, H12 was accepted. The study established a direct relationship between net benefits and TQM.

The Third objective of the study was to examine the relationship between TQM and organizational performance. For this, the researcher proposed hypothesis H13: TQM is positively related to organizational performance. Table 4.19 shows that

path H13: TQM➔Organizational performance has an unstandardized estimate of 0.729, standardized path coefficient of 0.60, standard error of 0.079, and the critical ratio was 9.171 with a p-value of 0.000, which is less than 0.05. This provides sufficient evidence to accept the research hypothesis. Thus, H13 was accepted. The study established a direct relationship between TQM and organizational performance.

4.9 Mediation Analysis

A mediating variable is a variable that mediates the effect from an independent variable to a dependent variable. Direct effects are the relationship linking two constructs with a single arrow. Indirect effect are those relationships that involve a sequence of relationships with a least one intervening construct involved. Indirect effects are consistent with mediation (Hair et al., 2010). Total effects are the sum of all direct and indirect effects of one variable on another (See Figure 4.9). To demonstrate the mediating effects, the following conditions must exist as suggested by Baron and Kenny (1986):

1- The independent variable X must be significantly related to the mediating variable M.

2- The independent variable X must be significantly related to the dependent variable Y.

3- When the effect of the mediating variable M is added in the relationship between the independent variable X and the dependent variable Y, the path coefficient must be significantly decreased.

4- The relationship between the mediating variable M and the dependent variable Y must be significant.

$$c = \text{Direct effect}; \text{Indirect effect} = a*b; \text{Total effect} = c + b*c$$
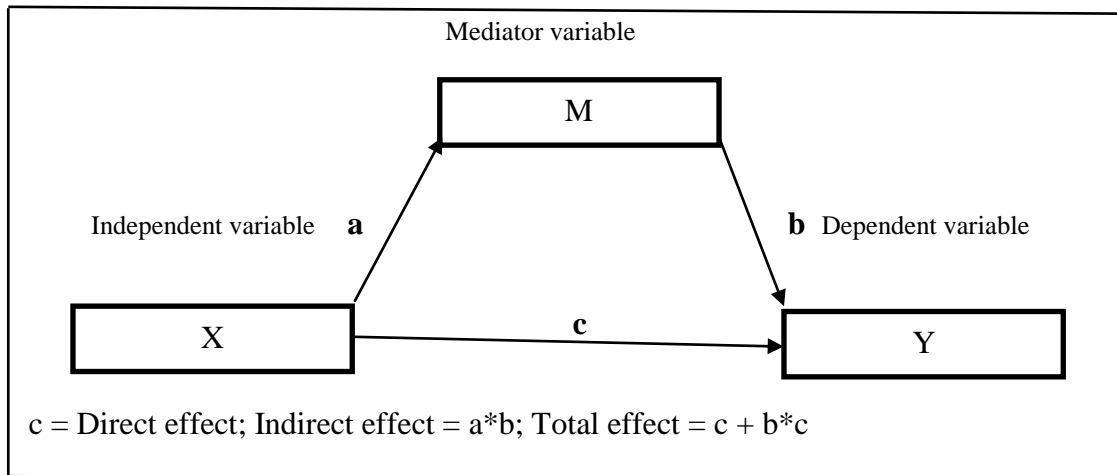
Figure 4.9. Direct and Indirect Effects.

Full mediation occurs if the independent variable X has no significant effect when the mediator M is in the equation. Partial mediation occurs if the effect of the independent variable X is smaller but significant when the mediator M is in the equation (Yahya, 2011).

The fourth objective of the current study was to examine the mediating role of TQM in the relationship between MIS indicators and organizational performance at the Missan Oil Company though there has been no research dealing with the role of mediation for TQM between MIS and organizational performance. In this study, all direct effects were investigated using SEM. In addition, the study calculated indirect effects to test the mediation of TQM between MIS indicators and organizational performance. Therefore, the study proposed six hypotheses. Hypothesis H14 states that H14: TQM mediates the relationship between system quality and organizational

performance; hypothesis H15: TQM mediates the relationship between information quality and organizational; hypothesis H16: TQM mediates the relationship between Service quality and organizational performance; hypothesis H17: TQM mediates the relationship between use of MIS and organizational performance; hypothesis H18: TQM mediates the relationship between user satisfaction and organizational performance and hypothesis H19: TQM mediates the relationship between net benefits and organizational performance.

Mediation analysis was performed in two stages as prescribed by Preacher and Hayes (2008). In the first stage, direct relationships without mediators were calculated. Thus, the direct relationship of system quality and organizational performance usage was tested during the first stage to test Hypothesis H14, as shown in Figure 4.10. Table 4.20 shows the results of the mediation analysis. The results indicated that the direct effect of S➜OP was significant at b=0. 206 with a p-value of 0.003, which is less than 0.05. In the second stage, the mediator was entered in the model and the indirect effect was calculated. The indirect effect of path S➜TQM➜OP was 0.296. Furthermore, to test the significance of the indirect path, the study used bootstrapping for the significance of the indirect effects as prescribed by Preacher and Hayes (2008). The results indicated that the indirect path was significant as the p-value was 0.013. This p-value is less than 0.05. Thus, hypothesis H14 was accepted. Moreover, the mediation is full as the direct effect was significant before mediation and not significant after entering mediation in the model.
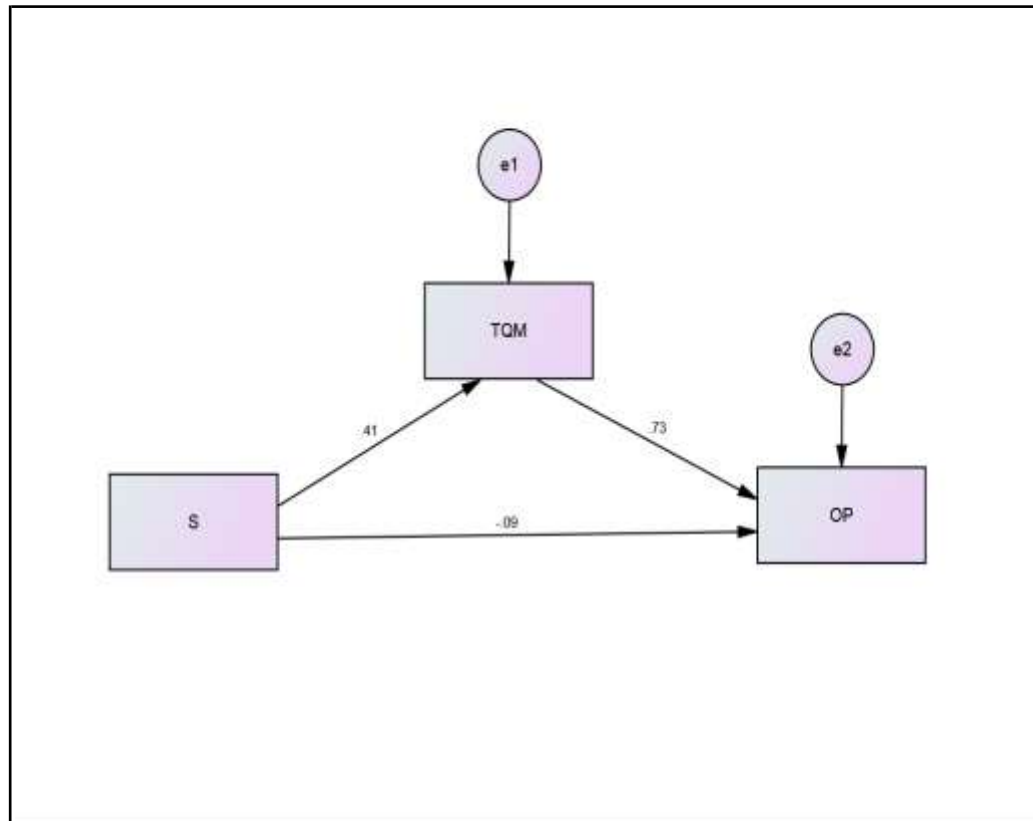
Figure 4.10. Mediation Effect of TQM Between S and OP.

Thus, the direct relationship of information quality and organizational performance usage was tested at first stage to test Hypothesis H15, as shown in Figure 4.11. Table 4.20 shows the results of the mediation analysis. The results indicated that the direct effect of IQ➔OP was significant at b=0.288 with a p-value less than 0.05. At the second stage, mediator was entered in the model and indirect effect was calculated. The indirect effect of path IQ➔TQM➔ OP was 0.236. Furthermore, to test the significance of the indirect path, the study used bootstrapping for the significance of the indirect effects as prescribed by Preacher and Hayes (2008). Results indicated that the indirect path was significant as the p-value was 0.001. This p-value is less than 0.05. Thus, hypothesis H15 was accepted and from there, exists a full mediation of TQM between information quality and organizational performance.
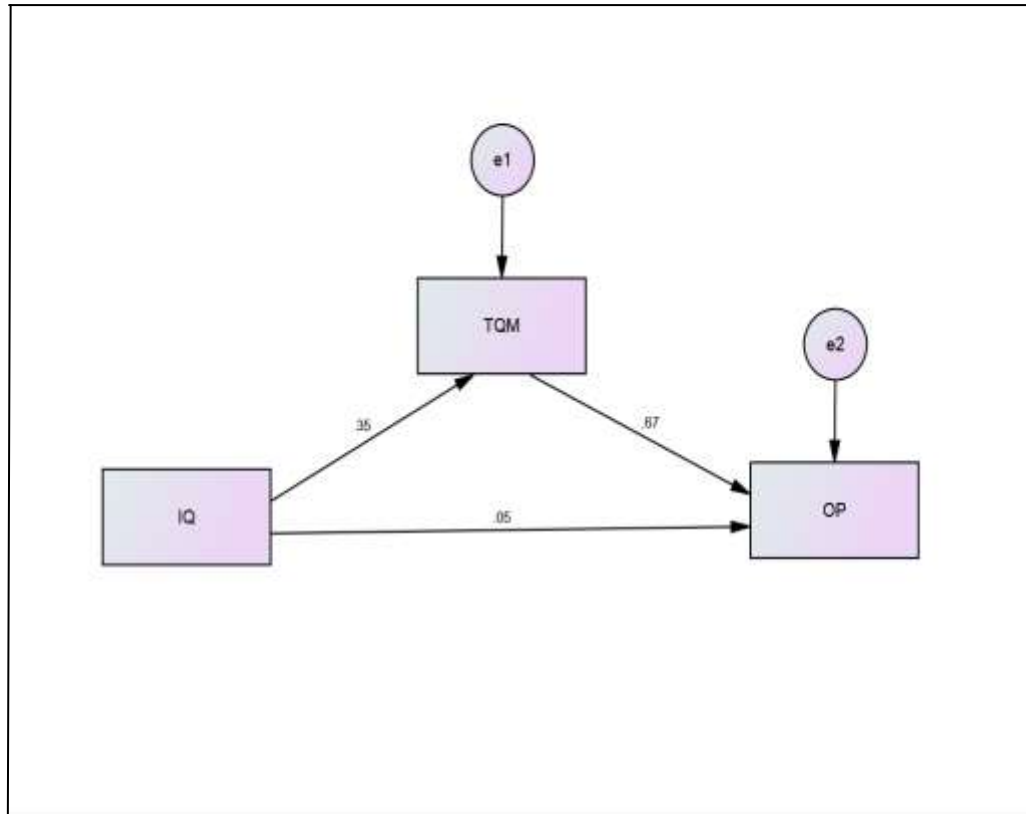
Figure 4.11. Mediation Effect of TQM Between IQ and OP.

The direct relationship of service quality and organizational performance usage was tested during the first stage to test Hypothesis H16, as shown in Figure 4.12. Table 4.21 shows the results of the mediation analysis. The results indicated that the direct effect of SQ➔OP was insignificant at b=0.046 with a p-value 0.515, which is above than 0.05. According to Baron and Kenny (1986), the independent variable SQ must be significantly related to the dependent variable organizational performance. Thus, hypothesis H16 was rejected.
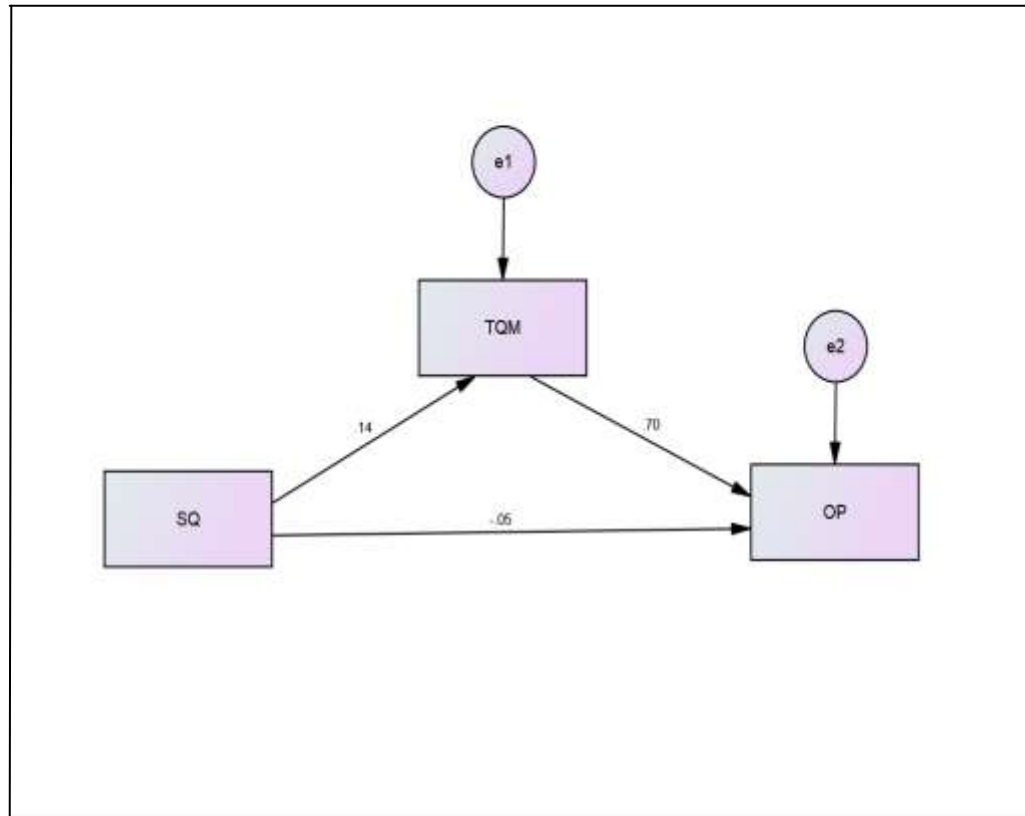
Figure 4.12. Mediation Effect of TQM Between SQ and OP.

The direct relationship of use of MIS and organizational performance usage was tested during the first stage to test Hypothesis H17, as shown in Figure 4.13. Table 4.20 shows the results of the mediation analysis. The results indicated that the direct effect of U➔OP was significant at b=0.226 with a p-value 0.001, which is less than 0.05. In the second stage, mediator was entered in the model and the indirect effect was calculated. The indirect effect of path U➔TQM➔ OP was 0.291. Furthermore, to test the significance of the indirect path, study used bootstrapping for the significance of the indirect effects as prescribed by Preacher and Hayes (2008). The results indicated that the indirect path was significant as the p-value was 0.001. This p-value is less than 0.05. Thus, hypothesis H17 was accepted. Thus, the full mediation of TQM exists between use of MIS and organizational performance.
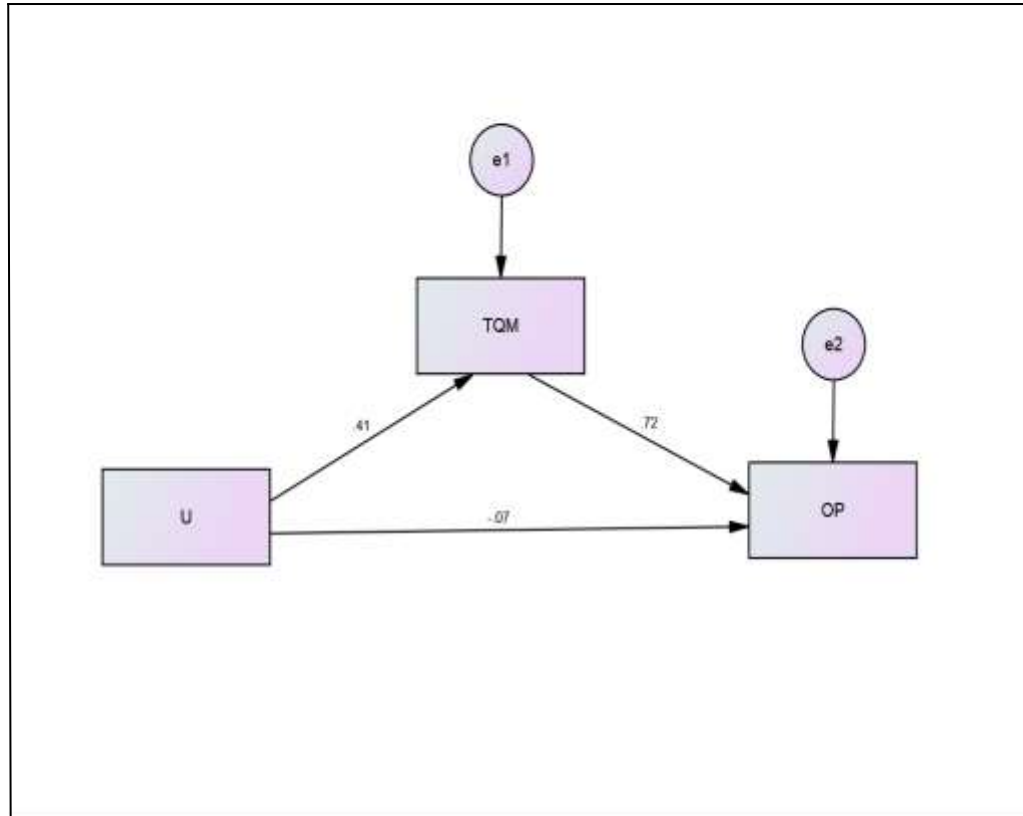
Figure 4.13. Mediation Effect of TQM Between U and OP.

Thus, the direct relationship of user satisfaction and organizational performance usage was tested at first stage to test Hypothesis H18, as shown in Figure 4.14. Table 4.20 shows the results of the mediation analysis. The results indicated that the direct effect of US➔OP was significant at b=0.462 with a p-value less than 0.05. During the second stage, mediator was entered in the model and indirect effect was calculated. The indirect effect of path US➔TQM➔OP was 0.341. Furthermore, to test the significance of the indirect path, the study used bootstrapping for the significance of the indirect effects as prescribed by Preacher and Hayes (2008). The results indicated that the indirect path was significant as the p-value was 0.001. This p-value is less than 0.05. Thus, hypothesis H18 was accepted. Moreover, the

mediation is partial as the direct effect was significant before mediation and after entering mediation in the model.
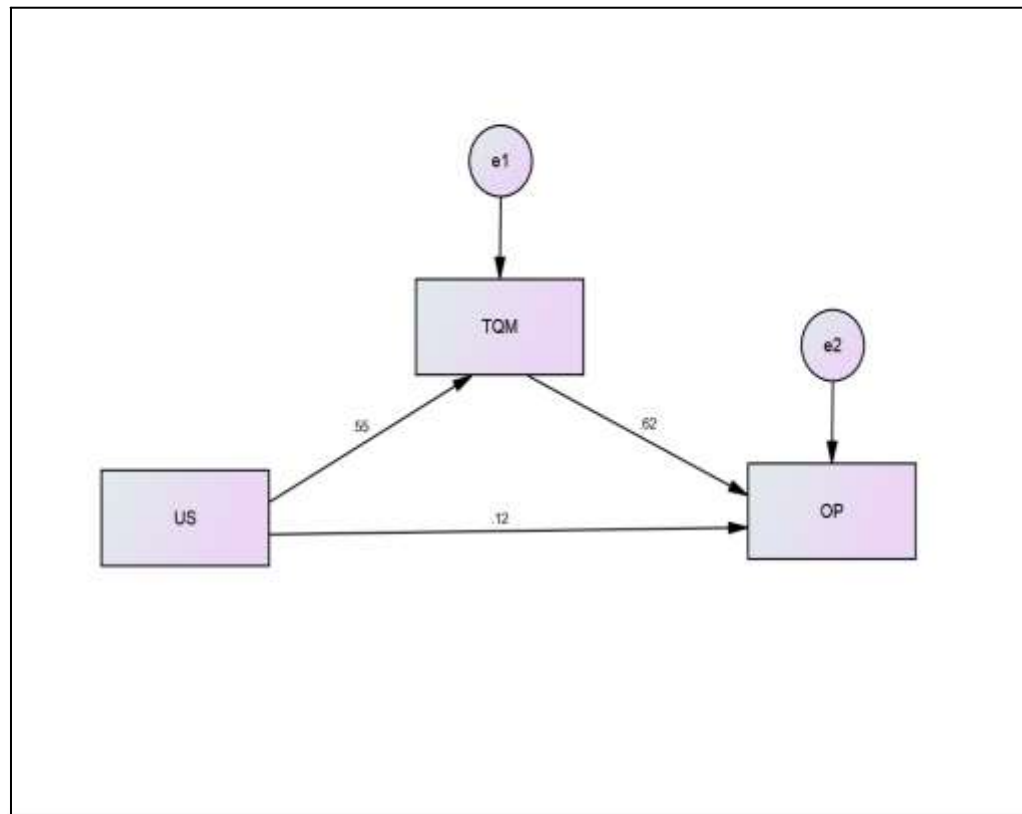

Figure 4.14. Mediation Effect of TQM Between US and OP.

Thus, the direct relationship of net benefits and organizational performance usage was tested at first stage to test Hypothesis H19, as shown in Figure 4.15. Table 4.20 shows the results of the mediation analysis. The results indicated that the direct effect of NB➔OP was significant at b=0.421 with a p value less than 0.05. In the second stage, mediator was entered in the model and the indirect effect was calculated. The indirect effect of path NB➔TQM➔OP was 0.266. Furthermore, to test the significance of the indirect path, study used bootstrapping for the significance of the indirect effects as prescribed by Preacher and Hayes (2008). Results indicated

that the indirect path was significant as the p-value was 0.001. This p-value is less than 0.05. Thus, hypothesis H19 was accepted. Moreover, the mediation is partial as the direct effect was significant before mediation and after entering mediation in the model.
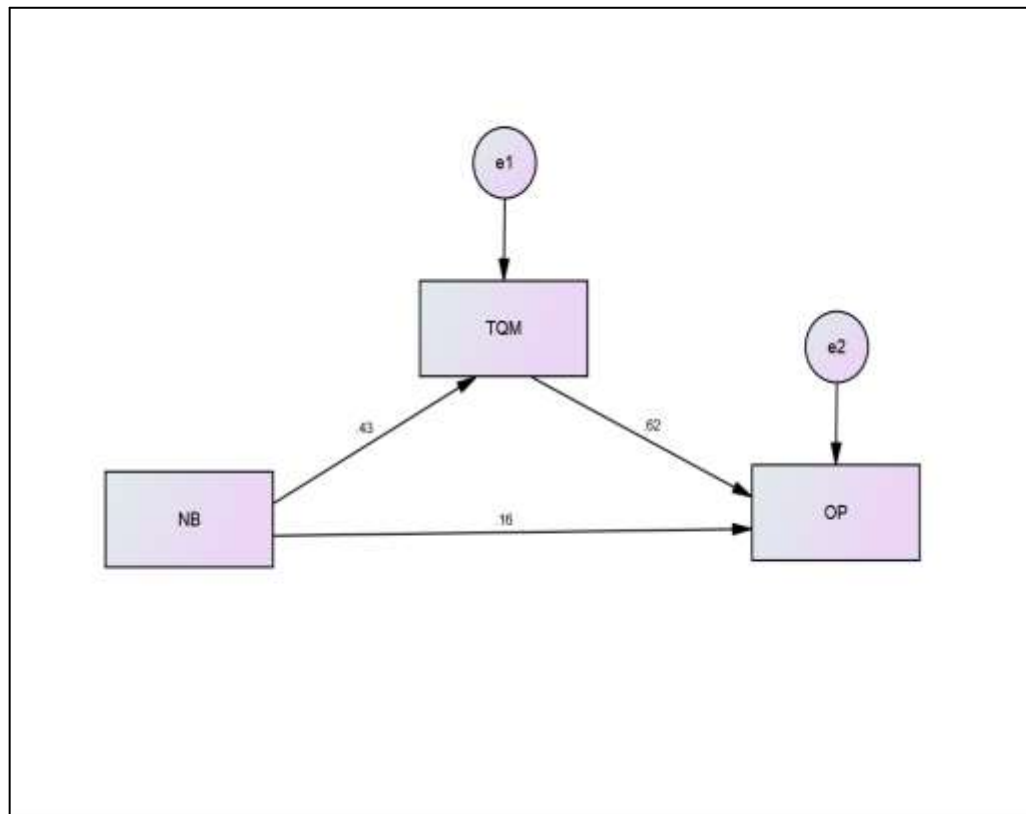

Figure 4.15. Mediation Effect of TQM Between NB and OP.

Table 4.20

Mediation Analysis

Hypotheses	Direct Relation. without mediator	p-value	Direct Relation. with mediator	p-value	Indirect effect	P-value bootstrap	Result
S➔TQM➔OP	0.206	0.003	-0.090	0.108	0.296	0.013	Significant Full Mediation
IQ➔TQM➔OP	0.288	***	0.052	0.345	0.236	0.001	Significant Full Mediation
SQ➔TQM➔OP	0.046	0.515	-0.049	0.347	0.095	0.038	Not Significant
U➔TQM➔OP	0.226	0.001	-0.065	0.244	0.291	0.001	Significant Full Mediation
US➔TQM➔OP	0.462	***	0.121	0.045	0.341	0.001	Significant Partial Mediation
NB➔TQM➔OP	0.421	***	0.155	0.005	0.266	0.001	Significant Partial Mediation

*** Significant at p<0.01.

4.10 Summary of Hypotheses Findings

The relationship between MIS indicators, TQM and organizational performance was examined. Nineteen hypotheses were formed based on previous studies and frameworks, and were tested with the collected data using SEM of AMOS. A summary of the nineteen hypotheses is shown in Table 4.21. Testing of the hypotheses is to show evidence of support that a theoretically specified model fits the sample data.

Table 4.21

Summary of Hypotheses Findings

Hypothesis	Results
H1: System quality is positively related to organizational performance.	Not Supported
H2: Information quality is positively related to organizational performance.	Supported
H3: Service quality is positively related to organizational performance.	Not Supported
H4: Use of MIS is positively related to organizational performance.	Not Supported
H5: User satisfaction is positively related to organizational Performance.	Supported
H6: Net benefits are positively related to organizational performance.	Supported
H7: System quality is positively related to TQM.	Supported

H8: Information quality is positively related to TQM.	Supported
H9: Service quality is positively related to TQM.	Not Supported
H10: Use of MIS is positively related to TQM.	Supported
H11: User satisfaction is positively related to TQM.	Supported
H12: Net benefits are positively related to TQM.	Supported
H13: TQM is positively related to organizational performance.	Supported
H14: TQM mediates the relationship between system quality and organizational performance.	Supported
H15: TQM mediates the relationship between information quality and organizational.	Supported
H16: TQM mediates the relationship between Service quality and organizational performance.	Not Supported
H17: TQM mediates the relationship between use of MIS and organizational performance.	Supported
H18: TQM mediates the relationship between user satisfaction and organizational performance.	Supported
H19: TQM mediates the relationship between net benefits and organizational performance.	Supported

4.11 Summary

The present chapter validated the planned research methodology and explained the rationale for this choice of research and analytical design. This was carried out by testing the proposed hypotheses and answering the research questions along with

providing information about research design, sampling techniques, sample description, selected variables and the proposed procedures. Also, an analysis of the data is included in this chapter. SEM was used to test the hypothesis of the study. In the next chapter, the discussions derived from the research's findings are discussed. The chapter provides answers to the research questions presented at the beginning of the study as well as the concluding remarks for this study. The thorough discussion of the outcomes obtained in this chapter and their impact on the research objectives and implications, limitations and future research will be explained in the final chapter of this thesis.

CHAPTER 5

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the findings of the study. The chapter begins by highlighting the research process adopted for the current study. This is followed by a discussion of each research objective. Furthermore, the theoretical and practical implications of the study are provided, followed by future recommendations and concluding remarks.

5.2 Discussion of the Findings

The following subsections discuss the findings based on the four broad objectives of this study.

5.2.1 Relationship Between MIS Indicators and Organizational Performance

The first objective of the study was to examine the relationship between MIS indicators and organizational performance. Six major MIS indicators were identified for this study. These MIS indicators are system quality, information quality, service quality, use of system, user satisfaction and net benefits. The results have indicated that information quality, user satisfaction and net benefits positively influenced organizational performance. Improving the performance of the Missan Oil Company depends on the extent to which the company can benefit from the advantages of MIS and achieve the satisfaction of its users. The result of this study is in line with the findings of previous studies (Azadeh et al., 2016; Salleh, Zakaria, & Abdullah, 2016; Al-Mamary et al., 2015).

Many researchers have indicated that there is a positive relationship between system quality, service quality, use of system and organizational performance (Agu et al., 2017; Afandi, 2017; Ndlovu, 2015; Munirat et al., 2014; Kehinde & Yusuf, 2012). Nevertheless, the results of this study indicated a negative relationship between system quality, service quality, use of system and organizational performance at the Missan Oil Company. This is due to the low efficiency of the MIS used by the

company, in addition to the weakness of the users of these systems. This is in line with the findings of Ominunu (2015), who indicated that there was no relationship between MIS and organizational performance because of the low and poor organizational culture towards MIS. According to Saddam (2017), the poor technology, poor safety and training procedures, outdated training, poor training and poor safety procedures are among the most cited issues in the Iraqi oil sector. Hendrix (2013) also highlighted that information technology is required for Iraq to develop and be competitive.

Similarly, Saddam (2017), Al-Shukri (2013) and Al-Moumen (2009) argued that the Iraqi oil industry is suffering from weak management, lack of facilities, lack of training due to the ageing infrastructure, administrative procedures, the emigration of talent, the weakness of the educational sector, which is supplying the sector with human resources, the lack of well thought out plans and inadequate skills. It suffers from a lack of technocrats and expertise, which reflects the decline in production and the great waste and the poor quality of oil products and dependence on imports to meet energy needs.

The first objective was to identify the impact of MIS indicators on organizational performance. The overall study findings suggested that information quality, user satisfaction and net benefits have a positive influence on organizational performance, whereas the system quality, service quality, use of system have a negative relationship with an organizational performance at the Missan Oil Company.

The first objective of the study also focused on the identification of MIS indicators that have the most influence on organizational performance. For this purpose, the researcher compared the path coefficient of all six MIS indicators i.e. system quality, information quality, service quality, use of system, user satisfaction and net benefits. The findings conclude that the net benefits are the most influential MIS indicators at the Missan Oil Company. So improving the performance of the Missan Oil Company depends on its ability to maximize the use of the MIS.

According to Urbach et al. (2009), net benefits cover aspects of task performance, job efficiency, improved use and exchange of knowledge, improved communication, and overall usefulness. Also, increased sales, cost reductions, improved profits, market efficiency, consumer welfare, creation of jobs, and economic development (Petter et al., 2008). Furthermore, Halawi et al. (2008), identified that there is a significant relationship between net benefits as measured by improvements in performance and intention to use. Thus, it is assumed that higher performance leads to greater intention to use. Subsequently, MIS can affect organizations in various ways. For example, to increase operating efficiency and effectiveness, to increase revenue and customer satisfaction, to reduce costs, and to achieve goal and business strategy, and finally to increase organization's performance (Boonmak, 2007). Similarly, researchers (Khresat, 2015; Ndlovu, 2015; Al-Mamary et al., 2015; Agu et al., 2017) argued that the use of MIS brings great benefits to organizations and is positively reflected on their organizational performance. Consequently, the results indicated that the current study achieved its first objective.

5.2.2 Relationship Between MIS Indicators and TQM

The second objective of the study was to investigate the relationship of MIS indicators with TQM. The findings of the current study revealed that MIS indicators system quality, information quality, use of system, user satisfaction and net benefits are more relevant to enhance TQM at the Missan Oil Company. Moreover, improving the quality of the Missan Oil Company requires the expansion of the use of MIS.

Increasingly, enterprises found that the information systems are key success factors of TQM. Therefore, the factors making the implementation of TQM successful include management capability of quality information, production rationalisation, and automation (Lin et al., 2012). According to Fok et al. (2001), TQM and information system have common objectives.

The results obtained from similar research indicated a positive relationship between MIS and TQM directly or indirectly (Almashaqba, 2013; Lin et al., 2012; Zbar, 2009; Spencer & Duclos, 1998). The role of quality is a critical issue for information systems, as information is one of the most valuable assets of an organization (Cheon & Stylianou, 2001). According to Fok et al. (2001), organizations that have fully incorporated TQM would approach the design/development of a new information system very differently compared to those which have not.

Moreover, many researchers have indicated a positive relationship between service quality and TQM (Pattanayak, Koilakuntla, & Punyatoya, 2017; Hawary &

Laimon, 2013; Lam, Lee, Ooi, & Phusavat, 2012; Sit, Ooi, Loke, & Han, 2011; Talib, Rahman, Qureshi, & Siddiqui, 2011). In contrast, the findings of this study indicated that service quality is not related to TQM at the Missan Oil Company because the MIS at the Missan Oil Company provides a low level of service. This result implicitly correlates with the findings of Dahlgaard, Kristensen, Kanji, Juhl, and Sohal (1998), who referred to a significant gap between the successes with TQM for the information system in many companies.

The second objective was to identify the impact of MIS indicators on TQM. Overall, the findings suggested that system quality, information quality, use of system, user satisfaction and net benefits have a positive influence on TQM. Whereas service quality has no relationship with TQM at the Missan Oil Company. This finding is consistent with Talib et al. (2011), who identified causes through a set of barriers such as lack coordination between departments; human resource barriers; no benchmarking, poor planning; employee's resistance to change; inadequate use of empowerment and teamwork; lack of continuous improvement culture; and lack of communication.

5.2.3 Relationship Between TQM and Organizational Performance

The third objective of the study was to examine the relationship between TQM and organizational performance. The current study found that TQM influences organizational performance. Improving the performance of the Missan Oil Company requires effective implementation of TQM. To this end, the company's management

has developed a plan towards achieving ISO 9001. This result is consistent with the existing literature (Antunes, Quirós, & Justino, 2018; Jimoh, Oyewobi, Isa, & Waziri, 2018; Singh, Kumar, & Singh, 2018; Shafiq et al., 2017; Sadikoglu & Olcay, 2014; Ahmad, Zakuan, Jusoh, & Takala, 2012), which stated that the implementation of TQM practices leads to improved performance and increased competitiveness.

The positive relationships between TQM practices and organization performance measures can motivate the top management of the firms to be involved in the better planning of organizations goals, to arrange resources in time, effort, and capital to the implementation of TQM in pursuit of improved quality, employee, and firm performances (Singh et al., 2018). According to Abdullah, Uli, and Tarí (2008), quality improvement practices can positively affect the firm's competitive position in terms of costs and differentiation. Quality can be applied at all levels, often showing that costs can be reduced and levels of differentiation increased. This idea suggests that quality improvement practices may have positive effects on performance. In this sense, improving organizational performance to enhance customer (citizens) satisfaction is the definite aim of TQM implementation through producing goods and services with high-quality through stakeholders' collaboration, building teamwork, and continuous improvement of performance by adopting quality management practices and tools (Mosadeghrad, 2014). Consequently, the findings of this study are instrumental in establishing a relationship between TQM and organizational performance at the Missan Oil Company.

5.2.4 Mediating Role of TQM

The fourth objective of the study was to examine the mediating role of TQM in the relationship between MIS indicators and organizational performance. MIS positively connects to TQM (Lin et al., 2012), which is positively related to organizational performance (Singh et al., 2018). Furthermore, TQM focuses on several important areas such as leadership, continuous improvement, innovation, customer focus, strategic planning, benchmarking, service design, etc. The application of these techniques and practices in an organization can be helpful to achieve the desired organizational performance. Therefore, a mediated relationship of TQM is proposed between MIS indicators and organizational performance. The mediating role of TQM with six MIS indicators are system quality, information quality, service quality, use of system, user satisfaction and net benefits were tested with organizational performance. The results indicated that TQM mediates the relationship between five of the MIS indicators which are system quality, information quality, use of system, user satisfaction and net benefits with organizational performance. The implementation of TQM at the Missan Oil Company has advantages in the direction of improving the use of MIS, which reflects positively on the performance of the company.

Although the researcher did not find a research that deals with the mediating role of TQM between MIS and organizational performance, this result is in line with the results of previous studies (Mehralian et al., 2016; Al-Dhaafri et al., 2016; Demirbag et al., 2006; Prajogo & Sohal, 2006b) that proved the role of mediation for TQM in improving organizational performance.

Moreover, the results indicated the TQM does not mediate the relationship between service quality and organizational performance. Corredor & Goñi (2011), Demirbag et al. (2006), Nair (2006) and Kaynak (2003) indicated that a negative or insignificant relationship exists between TQM and performance. Thus, the results indicated that the current study achieved its fourth objective. The last objective of this study is to investigate the mediating role of the TQM between MIS indicators and organizational performance. The findings of this study revealed that the impact of system quality, information quality, use of system, user satisfaction and net benefits on organizational performance was mediated by TQM while service quality was not mediated by TQM at the Missan Oil Company. This is because the low level of service quality at the Missan Oil Company is a real problem that requires urgent treatment.

5.3 Implications of The Study

The findings from this study have provided theoretical and practical contributions to the literature on sustainable manufacturing in a socio-technical context. These contributions are discussed in the following sections.

5.3.1 Theoretical Contribution

This study found empirical evidence for the theoretical relationships posited in the research framework. First, this study is the re-examination of the information and

quality concepts and their link with organizational performance literature. This research provides the idea that MIS indicators and TQM can jointly improve the organizational performance by effective use of information and continues improvement.

Second, the framework of this study is based on the resource-based view theory, technology acceptance model and diffusion of innovation theory. The RBV perspective considers information systems as resources, and by virtue, the effective utilisation of these resources leads an organization to the higher level of organizational performance. Similarly, the use of technology, including MIS, requires, in accordance with TAM, two basic requirements perceivable utility and perceived ease of use. Therefore, in order to achieve these two conditions, the organization must have a culture that promotes organizational learning and staff participation, which is provided by TQM. In conclusion, the existence of a comprehensive re-management is an important factor in the expansion of the use of MIS thus improving organizational performance. In addition, according to the DOI theory, the application of TQM is an important factor in spreading the use of MIS in the organization and thus the improvement of organizational performance. Therefore, these were the contributions of this study.

Third, this study contributes to knowledge enhancement in the field of MIS, TQM and strategic management. The current study used the RBV to examine the relationship between MIS indicators and organizational performance in the context of the Iraqi oil sector, second, the mediating role of TQM was tested between MIS and organizational performance. Recently, researchers (Al-Mamary et al., 2015; Ndlovu,

2015; Khresat, 2015; Agu et al., 2017) explored the MIS indicators to enhance organizational performance. However, the current study exposed three foremost missing links that provide the opportunity to the researchers to contribute to the body of knowledge.

Fourth, previous researchers focused on examining the direct relationship of MIS indicators with organizational performance (Kehinde & Yusuf, 2012; Afandi, 2017). However, some researchers have mentioned that this relationship is indirect (Hashim, Yousaf, Jehangir, Khan, & Hadi, 2012). Thus, the current study contributes to the body of knowledge by adding TQM as the mediator between the relationship of MIS indicators and organizational performance. In addition, the MIS indicators that are more influential towards the organizational performance were unexplored. Thus, this study contributes to the body of knowledge by exploring the most influential MIS indicators that contribute to organizational performance.

Finally, the findings of the study are significant if the context of this study is also taken into consideration. According to the literature, most of the existing studies on MIS have concentrated on the developed nations especially within the Western context. Sharabati, Jawad, and Bontis (2010) asserted that there is a lack of empirical work within developing nations. There is limited literature available on the context of the Iraqi oil sector (Saddam, 2017). Accordingly, this study contributes to the growing body of knowledge by providing empirical evidence on MIS and TQM and its linkage with organizational performance in the context of the Missan Oil Company in Iraq. Such an experiment could be helpful for other Iraqi oil companies with comparable managerial and cultural contexts.

5.3.2 Practical Contribution

The findings of this study have provided practical and managerial implications from its empirical evidence and validation, which would make it generally applicable across Iraqi oil companies. Firstly, the results suggested that MIS indicators are critical in enhancing the effectiveness and productivity of the Missan Oil Company. Recently, the Iraqi oil sector has undergone several transformations that have led to a decline in its performance. The Missan Oil Company is looking at ways to enhance its performance. In this regard, the findings of the current study are milestones for the Missan Oil Company, which should enhance its MIS indicators to improve its performance.

Secondly, previous work focused on a particular set of MIS indicators also MIS indicators are more influential towards the organizational performance was unexplored. Thus, the findings of the current study suggested that MIS indicators such as information system, user satisfaction and net benefits are key MIS indicators that managers at the Missan Oil Company need to implement. The findings suggest that a net benefit is the strongest contributor to organisational performance.

Thirdly, most of the previous research was focused on the financial measures of organisational performance. However, in the real scenario, the organisational performance cannot be measured through financial measures only. This study used financial and non-financial measures of organisational performance.

Fourthly, the findings of this study suggested that TQM is an important factor that influences organisational performance. Thus, managers must motivate their employees towards quality commitment by promoting a quality culture within the organisation. These activities enhance not only employee satisfaction but are also important for organisational performance.

Finally, the framework proposed in this study provides the managers at the Missan Oil Company a fruitful way of strategizing how organisations apply MIS and TQM to enhancing organisational performance.

5.4 Study Limitations and Future Research Directions

As is always the case when doing research, this study has a number of limitations that should be considered when interpreting the results. These limitations provide opportunities for future studies to consider. Firstly, this study used a limited sample for the current study to avoid the time and monetary constraints. The researcher used a random sample of 250 managers at the Missan Oil Company. This discloses a limitation on the sample size and sampling procedure. This limitation can affect the generalisability of the results. The results with a larger sample size and different sampling strategy may differ from the results of the current study as it was conducted at managers' level and not organization level.

Secondly, in this study, a self-administered questionnaire was used and the questions asked in the survey may be unclear to some respondents which could be

affected by response biases. Hence, it is suggested that a field observation be performed in order to get a clearer picture from the respective respondents themselves.

Thirdly, the survey of present study adopted a cross-sectional methodology, not longitudinal where the same sample is investigated only once. Because of this, the time sequence of the links among the variables cannot be determined. Although a cross-sectional methodology is sufficient to identify the relationship among different constructs, longitudinal research could reinforce the causal relationship among the different constructs by inferring cause and effect (Ozcelik, 2010). Therefore, future research should include longitudinal research designs so that a clearer picture of causation can be obtained.

Fourthly, despite the concept of TQM and organizational performance being tapped through the multidimensional scales but only as one-dimensional constructs during the analysis to avoid statistical and operational complexities. This provides another limitation on the generalisability of the results. Therefore, future researchers are recommended to use the construct as a formative construct to see the variations in the results.

Fifthly, this study is specific to the oil sector and may not be applicable to any other industry. Geographically, the present study was done in the Missan Oil Company in Iraq only because of time and financial constraints. It can be generalised to other Iraqi companies, but it cannot be generalised to other countries because each country has a different culture and culture which affects people's behaviour and

attitudes. Therefore, a replication study is advised instead of generalising the findings of the present study to another industry or country.

Finally, the MIS indicators selected in this research are limited in scope, as six MIS indicators were studied. Other broader factors governing MIS indicators could have an effect on organizational performance. Examples include organizational culture, organizational structure and the practice of continuous improvement. These dimensions could be included in future research.

5.5 Recommendations

The findings of this study found that MIS indicators affected organizational performance. According to Al-mamary et al. (2014), MIS seeks to supply reliable, exact, relevant and complete information to directors towards increasing the organisational performance of organizations. This study recommends that managers of the Missan Oil Company take the necessary steps to increase the level of use information systems so that they will contribute towards accomplishing better organizational performance.

Moreover, the results of this study indicated a positive relationship between the MIS indicators and TQM. According to Lin, Chuang, and Shih (2012), the factors that make the application of TQM successful involve management capability of quality information, production rationalisation, and automation. Organisations have increasingly found that IT and information systems are the leading success factors of

TQM. Consequently, this study recommends that the managers of the Missan Oil Company apply MIS and TQM in concert.

Furthermore, TQM affected organizational performance. According to Yusof and Aspinwall (2001), TQM helps to manage companies and organisations to develop their whole efficiency and performance in order to attain a world-class position. Hence, this study recommends that managers of the Missan Oil Company on the prevalence of quality culture in the company and create a positive organizational climate that makes the responsibility for quality improvement rests on all employees in the company.

In summary, the findings of this research showed that TQM mediated the relationship between MIS and organizational performance. When TQM is improved, the performance of the Missan Oil Company could improve. Thus, this study recommends that the managers of the Missan Oil Company should implement TQM towards achieving the said purpose.

5.6 Conclusion

The overall research focused on investigating the relationship between MIS indicators and organizational performance with the mediating role of TQM in the Iraqi oil sector. For this purpose, the researcher proposed 19 hypotheses on the basis of its objectives and research questions. A total of 250 managers were taken from the Missan Oil Company as a sample for this study to test the proposed hypotheses. After

a rigorous literature review, the researcher explored a set of MIS indicators for this study. These MIS indicators were system quality, information quality, service quality, use of system, user satisfaction and net benefits. Similarly, the construct of TQM was measured based on the practices of leadership, customer focus, human resource management, strategic planning, process management and information & analysis. The construct of organizational performance was measured based on the financial perspective, customer perspective, internal process perspective and learning & growth perspective.

The theoretical foundations of this study were based on the resource-based view theory, technology acceptance model and the diffusion of innovation theory.

The overall model fitness of the proposed model for this study complements the proposed objectives of the study. The results indicated that there was no issue of convergent and discriminant validity among the constructs. The next stage was to test the hypotheses proposed by the current study using SEM. The findings indicated that MIS indicators mainly net benefits, information quality and user satisfaction influence organizational performance. While system quality, service quality and use of system have a negative effect on organizational performance.

The findings of the current study indicated that MIS indicators have a positive relationship with TQM except for service quality. In addition, TQM has a positive relationship with organizational performance. Also, the findings confirmed the mediation effect of TQM between MIS indicators and organizational performance except for service quality. The findings are important for the managers in the Iraqi oil

companies in order to enhance organizational performance. This study can be considered a modest guideline for managers at the Missan Oil Company to improve its organizational performance by applying MIS and TQM. The guide is applicable to the 15 Iraqi oil companies operating in Iraq as it shares the same context.

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Appendix (A)

Cover Letter for Survey Questionnaire

My name is REYATH THEA AZEEZ, I am currently undergoing Doctor of Philosophy (PhD) studies in management information systems at the Universiti Pendidikan Sultan Idris (UPSI), Malaysia. In fulfillment of the degree, I am required to conduct a research.

The present study is an attempt to investigate the relationship of the MIS and organizational performance along with mediating role of TQM between MIS and organizational performance. The research is important for Missan Oil Company as it plays an important role in the economy of Iraq. The findings from this research have the potential to assist Iraqi Oil companies managers in designing superior polices for improving the performance of their companies.

The questionnaire has been developed to minimize the amount of time for completion and to facilitate the summarization of findings. It should only take 20-30 minutes to complete. If you are interested to know the results of the study or about the study itself, please do not hesitate to contact me at the following address, or email me at abuteba1984@yahoo.com or call me at 0964772090396 or 601128379570.

Your responses will be treated in the strictest confidence. You are not supposed to mention your name. Only the aggregate findings will be published. If you have any query regarding the implementation of this study, you are encouraged to contact Supervisor Major Dr. KAMARUL BAHARI YAAKUB on his email: kamarul@fpe.upsi.edu.my.

Thank you for your valuable contribution to this research effort. While your participation is entirely voluntary, it is highly appreciated.

REYATH THEA AZEEZ
Faculty of Management and Economics
Universiti Pendidikan Sultan Idris
Tanjung Malim, Perak
 Malaysia

Appendix (B) – Survey Questionnaire

SULTAN IDRIS EDUCATION UNIVERSITY

**The Mediating Effect of Total Quality Management on
The Relationship Between Management Information
Systems And Organizational Performance**

Survey Questionnaire

PhD Student: REYATH THEA AZEEZ

Supervisor Major Dr. KAMARUL BAHARI YAAKUB

FACULTY OF MANAGEMENT AND ECONOMICS

2018

Section A: Demographic Profile

In this section, we are interested in your background briefly. Please tick your answer and your answers will be kept strictly confidential.

QA1: Gender: Male ☐   Female ☐

QA2: Age: Below 30 Years ☐ 31-40 Years ☐ 41-50 Years ☐

Above 50 Years ☐

QA3: Highest education completed:

☐ Baccalaureate / Diploma   ☐ Master Degree

☐ Bachelor Degree/Professional Qualification   ☐ PhD Degree

QA4: Length of time with your company:

☐ Less than 5 Years   ☐ 6 - 10 Years   ☐ 11 - 15 Years

☐ 61 - 20 Years   ☐ Above 20 Years

QA5: Your job position:

☐ Manager of Unit or Section

☐ Manager of Department

☐ General Manager/ Deputy General Manager / Manager of Division

QA6: Length of time with your job position:

☐ Less than 2 Years   ☐ 3 - 5 Years   ☐ 6 - 10 Years

☐ Above 10 Years

Section B: Management Information System Indicators

This section is seeking your opinion regarding the measurement of Management Information System (MIS) indicators in your company. Respondents are asked to indicate the extent to which they agreed or disagreed with each statement using the 5-point Likert scale (1-5). Where (1) strongly disagree and (5) strongly agree.

Please select one option per line representing your opinion with the following statements.

Management Information System: A system providing management with accurate and timely information necessary to facilitate the decision-making process and enable the organizations planning, control, and operational functions to be carried out effectively.

NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
B1	**System Quality:** The desired characteristics of the system like consistency and ease of use.					
S 1	The MIS in my company is easy to use.					
S 2	The functions of the MIS in my company meet my requirements.					
S 3	The MIS in my company is always available.					
S 4	The MIS in my company is safe.					
NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
B2	**Information Quality:** The degree to which information produced by the website is accurate, relevant, complete, and in the format required by the user.					
IQ 1	The MIS in my company presents information in a useful format and is understandable.					
IQ 2	The MIS in my company often presents information at a time suitable for its use.					
IQ 3	The MIS in my company provides more current (up-to-date) information.					
IQ 4	The MIS in my company provides the beneficiaries with accurate information.					
NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
B3	**Service Quality:** A comparison what the customer feels and what is actually provided.					
SQ1	The response time of the MIS in my company is good.					
SQ 2	The MIS in my company provides a decent service for users.					
SQ 3	The service quality of the MIS in my company affects the extent to which the system can be used.					
SQ 4	My company has specialists in MIS to address technical problems and emergencies if any.					
NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
B4	**Use of System:** The degree and manner in which staff and customers utilize the capabilities of an information system					
U 1	I often use the MIS applied in my company.					

NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
U 2	I am very interested in the process of continuing to use the MIS in my company to accomplish the tasks entrusted to me.					
U 3	The human and material resources supporting the MIS in my company have helped its success.					
U 4	The number of participants in the use of MIS in my company has been constantly increasing since its inception.					

NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
B5	**User Satisfaction**: The extent to which users of the system feel satisfied with its performance.					
US 1	Using my company's MIS helps improve productivity.					
US 2	The MIS in my company is very efficient.					
US 3	The MIS in my company is flexible enough.					
US 4	I am satisfied with the accuracy and objectivity of my company's MIS.					

NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
B6	**Net Benefits:** The benefits that can be gained by users benefits completing their own tasks.					
NB1	Using the MIS in my company helps reduce the time allotted to accomplish my tasks.					
NB2	Using the MIS in my company will improve my job performance.					
NB3	The application of the MIS in my company helps increase productivity.					
NB4	The MIS in my company enhances the effectiveness of my job.					

Section C: Total Quality Management

This section is seeking your opinion regarding the measurement of Total Quality Management (TQM) in your company. Respondents are asked to indicate the extent to which they agreed or disagreed with each statement using the 5-point Likert scale (1-5). Where (1) strongly disagree and (5) strongly agree.

Please select one option per line representing your opinion with the following statements.

Total Quality Management: An administrative philosophy that links all departments and units of the company to make them faster and more flexible to improve quality and achieve the satisfaction of customers and employees and satisfy their desires.

NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
C1	**The practices of Leadership:** The starting point of the system is that the commitment of management drives the staff of the company to approach the same method and thus the success of the application.					
PL 1	Senior management in my company has similar beliefs about my company's future direction.					

PL 2	Senior management in my company often cares about changes and supports the implementation of a culture of improvement, learning and innovation to achieve "excellence".					
PL 3	Employees in my company have the opportunity to participate in the implementation of the change procedures required.					
PL 4	My company has a high level of target unit at the individual and department level without any barriers.					

NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
C2	**Customer Focus:** The goal of the company is the basis and the last goal which works to satisfy his needs and desires and thus ensure his loyalty to the company.					
CF 1	My company constantly gets input from customers to identify and meet their needs and expectations.					
CF 2	My company has close relationships with its customers and works to create easy channels to communicate with them.					
CF 3	My company constantly listens to customer's complaints and works to solve them first hand.					
CF 4	My company uses a variety of methods to measure customer satisfaction.					

NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
C3	**Human Resource Management:** The extent of employees' persuasion and participation in the implementation of TQM.					
HR 1	My company conducts ongoing training programmes to develop staff capabilities including jobs planning.					
HR 2	My company is interested in measuring employee satisfaction periodically and regularly.					
HR 3	My company runs two-way communication from "top to bottom" and "bottom to top".					
HR 4	My company always cares about maintaining a working environment to ensure the health and safety of all employees.					

NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
C4	**Strategic Planning:** A long-term planning that takes into account internal and external variables and identifies sectors, target market segments and the method of competition.					
SP1	My company establishes a clear vision supported by all employees to determine the direction of its future business.					
SP2	My company uses comprehensive planning tools that contribute to the review of short and long-term goals.					

NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SP3	My company pays great attention to developing its plans, policies and objectives to meet the aspirations of all stakeholders and the community.					
SP4	My company adopts a major strategy with the approval of senior management covering all operations and at all levels.					
NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
C5	**Process Management:** A set of practices that and these are implemented in order to manage and improve processes that produce products and services**.**					
PM1	My company maintains clear and documented instructions that are understood by all employees about the procedures.					
PM 2	My company adopts advanced statistical methods in improving processes and reducing contrast.					
PM 3	My company continues to establish strategic partnerships with suppliers.					
PM 4	My company has a supplier evaluation guide and rating according to internationally accepted performance standards.					
NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
C6	**Information & Analysis:** Intended to manage databases and activities related to data analysis and conversion to information**.**					
IA 1	My company uses an effective performance measurement system to assess overall organizational performance.					
IA 2	Data and information about my company's performance are always available to the relevant parties.					
IA 3	The senior management of my company meets regularly to determine its performance and use it as a basis for future decisions.					
IA 4	My company compares consistently with similar companies in the field of work.					

Section D: Organizational Performance

This section is seeking your opinion regarding the measurement of organizational performance in your company. Respondents are asked to indicate the extent to which they agreed or disagreed with each statement using the 5-point Likert scale (1-5). Where (1) strongly disagree and (5) strongly agree.

Please select one option per line representing your opinion with the following statements.

Organizational Performance: A set of final results that the company wants to reach in order to achieve its objectives.

NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
D1	**Financial Perspective:** considers the availability and use of financial resources available to the company.					
FP1	My company is prioritising programmes that are very effective in cost containment.					
FP2	My company is very effective in maintaining spending.					
FP3	My company has sufficient funds to provide service programmes.					
FP4	My company has a clear vision of the process of allocating financial resources proportionately across programmes.					
NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
D2	**Customer Perspective:** The range of methods company uses to improve customer service and ultimately achieve satisfaction.					
CP 1	My company is constantly working to meet the expectations of its customers.					
CP 2	There has been significant improvement in the quality of my company's products.					
CP 3	There has been significant improvement in my company regarding the timing of meeting the needs of its customers.					
CP 4	The demand for my company's products is growing significantly.					
NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
D3	**Internal Process Perspective:** pertains to how work is achieved within the company. It concentrates on the procedures need to achieve customer satisfaction.					
IP 1	My company practices improved methods in its planning processes.					
IP 2	My company is interested in improving quality control processes.					
IP 3	My company takes a broad interest in its policies and procedures.					
IP 4	My company seamlessly connects communications across all organizational levels.					
NO.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
D3	**Learning & Growth Perspective:** the set of intellectual capabilities of the company's employees and their increasing skill levels.					
LG 1	My job is directly related to my area of speciality.					
LG 2	My job gives me a sense of accomplishment.					
LG 3	In my company, I received enough information to meet the requirements of my assigned task.					
LG 4	My company provides the training I need to meet my job requirements.					

"Thank you for your time, opinions and comments"

Appendix (C)
Assumption of Normality

Detrended Normal Q-Q Plot of System Quality

Histogram

Mean = 3.50
Std. Dev. = .708
N = 201

Normal Q-Q Plot of Information Quality

Detrended Normal Q-Q Plot of Information Quality

Histogram

Mean = 3.51
Std. Dev. = .59
N = 201

Normal Q-Q Plot of Service Quality

Detrended Normal Q-Q Plot of Service Quality

Histogram

Mean = 3.70
Std. Dev. = .701
N = 201

Normal Q-Q Plot of Use of System

Detrended Normal Q-Q Plot of Use of System

Histogram

Mean = 3.50
Std. Dev. = .74
N = 201

Normal Q-Q Plot of User Satisfaction

Detrended Normal Q-Q Plot of User Satisfaction

Histogram

Mean = 3.77
Std. Dev. = .769
N = 201

Normal Q-Q Plot of Net Benefits

Detrended Normal Q-Q Plot of Net Benefits

Histogram

Mean = 3.49
Std. Dev. = .656
N = 201

Normal Q-Q Plot of Total Quality Management

Detrended Normal Q-Q Plot of Total Quality Management

Histogram

Mean = 3.59
Std. Dev. = .68
N = 201

Normal Q-Q Plot of Organisational Performance

Detrended Normal Q-Q Plot of Organisational Performance