



*Sudan University of Sciences & Technology*



*College of Graduate Studies*

**Implementation of the Integrated Management System  
and its Effect in Performance Results: The Mediating  
Role of Human Capital Efficiency in Electricity Sector**

**تطبيق نظام الإدارة المتكامل وأثره على نتائج الأداء: الدور الوسيط لكفاءة رأس  
المال البشري في قطاع الكهرباء.**

*Thesis Submitted in Fulfillment of the Requirements for the Doctor of  
Philosophy in Quality & Excellence*

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# **DEDICATION**

To Sprit of my father and husband.

To source of love, my mother

To source of hope, my sons and daughters.

To my sisters

To my friends

I dedicate My Humble Efforts

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**Abstract:**

Integrated Management Systems have a special attention, given an importance from its role of international recognition and increase business results and Human Capital Efficiency. Drawing on the resource-based view, the study constructed a conceptual model hypothesizing a positive effect of Integrated Management System In the presence of mediating role of Human Capital Efficiency. The research applied survey for data gathering from probability sample of Electricity Sector in Khartoum state the 153 useable returned out of 200 surveys was sent. The hypotheses tested by using Structural Equation Modeling analysis. The Findings demonstrate that Electricity Sector adopt Integrated Management System as suggested in conceptual framework through dimensions (Quality Management (ISO 9001) and Environment Management System (ISO 14001)) and Business Results through dimensions (Achieving goals and Customer satisfaction), and Human Capital Efficiency, and. The results provided evidence that Integrated Management System have a positive effect on Human Capital Efficiency. Study provide theoretical, practical implications and limitations were cleared.

**Keywords: Integrated Management System, Business Results, Achieving goals and Customer's satisfaction, Human Capital Efficiency.**

## ملخص الدراسة:

حظي نظام الادارة المتكامل باهتمام كبير واعتراف دولي لماله من تأثير في تحقيق نتائج أداء الاعمال وزيادة كفاءة رأس المال البشري، وبناءاً على نظرية الموارد تم بناء نموذج الدراسة الذي إفترض وجود علاقة بين تطبيق نظام الادارة المتكامل بابعاده (نظام إدارة الجودة (ISO 9001) ونظام ادارة البيئة (ISO 14001) وأثره على نتائج الأعمال من خلال الأبعاد (تحقيق الأهداف و رضا العملاء) والدور الوسيط لكفاءة رأس المال البشري تم إستخدام الإستبيان لجمع بيانات الدراسة من عينة إحصائية في قطاع الكهرباء ولاية الخرطوم وزعت عليها عدد (200) إستبانة أستردت منها (153) إستبانة صالحة للتحليل بنسبة 77%. لإختبار الفروض تم إستخدام نمذجة المعادلة البنائية من خلال برنامج التحليل الاحصائي (AMOS)، أشارت النتائج الى ان شركات قطاع الكهرباء تطبق بمستويات مختلفة نظام الادارة المتكامل وان تطبيق النظام له تأثير إيجابي على رضا العملاء وليس له تأثير على تحقيق الأهداف، الى جانب هذه النتائج ومناقشتها فإن الدراسة أظهرت عدة مضامين نظرية وتطبيقية كما أبرزت الدراسة أوجه القصور.

**الكلمات المفتاحية:** نظام الادارة المتكامل، نتائج الاعمال، تحقيق الاهداف ورضا الزبائن وكفاءة رأس المال البشري.

# **Chapter One**

## **Introductions**

### **1.0 Introductions:**

The organizational changes and developments in management systems in light of the current situation of the institutions, which have become a rapid adaptation to the developments of the external environment is a key feature which determined by the survival and continuity, and the pace and complexity of changes had changed all the data that governed the systems of work and management and imposed new rules of adaptability, Openness, flexibility, independence, and institutions that advance towards achieving their vision and strategic objectives at higher rates, lower risks and a high level of opportunities must adopt modern management approaches that achieve impressive results through achieving the objectives of the institution and increasing the employee's satisfaction N dealers and community. ISO has defined the Quality Management System as a well-trusted system to ensure consistency and improvement of business practices, including products and services. ISO 9001 is designed to enable organizations to practice in order to achieve quality and meet customer requirements. Quality and Quality Assurance The quality management system represents the common factor in all applied brands such as the Japanese Deming Award, the American Malcolm Baldrige and the European Excellence Model.

Key issues to organizations are customer satisfaction and efficient utilizations of resources. These can be achieved through an implementation of an effective integrated management system. The standard management systems ISO 9001, ISO 14001, OHSAS 18001 are built on the theory that they can be achieved through implementing and improving organizational activities and behavior. This means a

system's principles and approach can be used throughout the business to provide a framework for managing all organizational standards, regulators and customer contract requirements. Karapetrovic et al. (2012) mentioned that, according to the latest "ISO Survey" (ISO, 2010), the worldwide levels of ISO 9001 and ISO 14001 registrations increased by 8% and 18%, respectively. Other examples of standardised management systems (MSs) that have been implemented in organisations address occupational health and safety (OHSAS, 18001), corporate social responsibility (SA 8000), information security (ISO 27001) and customer satisfaction (ISO 10000 series).

Effective management requires a good management system. Integrated Management System (IMS) is an enterprise-wide management system designed to meet the requirements of a customer who receives a product or service at a high quality and acceptable level by applying a quality system to all processes and stages of product or service delivery, ISO 9001, as well as the implementation of the Integrated Management System on environmental activities and management of the Organization in dealing with environmental impacts, especially those that are outside the legal limits and levels are known globally and locally, where the inventory and assessment of all the environmental effects resulting from the activity of the company and how to control it according to requirements of ISO 14001 environmental management system. The Integrated Management System is applied to Occupational Safety and Health (OSH) activities and processes where the risks in the organization are identified and evaluated with the control and control methods developed in accordance with OHSAS 18001 Occupational Safety and Health Management System. Integrated Management Systems (IMS) have been presented as a solution to decrease these negative consequences. In previous studies, a framework for a fully integrated management system based on managing all stakeholder needs was presented (Abrahamson et al., 2010).

The electricity sector derives its importance from the fact that it represents as a power generator of the economy and drives development and sustainability and is a fundamental supporter of it and one of its pillars, which requires a commitment from senior management to seek superior performance results and to find methods to develop these institutions through the application of modern management systems, And works hard to maintain them, and strive to upgrade them, and overcome all the challenges they face, to achieve a high degree of mastery of work and high levels of performance to reach excellence is the desired goal that everyone aspires to reach. Therefore, the transition from the information society to the industrial society has led to the increasing need for enterprises to be able to do more and more complex tasks, And on this basis changed the view to the factor as it is no longer limited to the qualifications and certificates, but what can be provided to the institution and therefore shifted attention from. Career qualification to evaluate competencies and creative qualifications

The environment in which enterprises operate has undergone fundamental changes at different levels, both domestic and international, as a result of information technology and communications revolution, the liberalization of global trade and the effects of globalization, which have opened the door to enterprises to exploit new opportunities. New competitors coming from outside the border. In these challenges, rethinking the need to gain competitiveness and achieve excellence in the field has become an urgent necessity if the institution is to maintain the foundations of this superiority, there are those who attribute the sources of excellence to factors that result from the external environment, but there is a trend to emphasize the importance and role of resources Internal competencies

The integrated management system is an internationally recognized preventive system, a well-organized method and a good follow-up of the product during all stages of production, circulation and distribution. It also provides systematic and

specific methods for institutions through which to manage environmental quality, safety and occupational health by increasing consumer confidence, To meet the requirements of customers and their expectations, and also takes into account the legal requirements in terms of the environment and achieve the requirements of occupational safety and health and provide a safe atmosphere of the risks that affect the human factor and contribute to the image of the image of the institution to external bodies and appear good appearance And a style to follow. Electricity consumption sector, where per capita consumption of electricity is used as one of the criteria for the advancement of peoples because of their contribution to the well-being of the people. in other words, the higher the per capita consumption of electricity, the better the individual's livelihood and the real progress in his well-being.

### **1.1 Statement of the Problem**

Achieving excellence business results requires the implementation of modern management approaches, most of the previous studies did not address the direct relationship between the implementation of the Integrated Management System through: (ISO 9001, ISO 14001, OSHAS18001) and its effect on business results, the study of (Mohamed Youssef, 2017) mentioned that there is impact of the implementation Integrated Management System (particularly dimensions of quality management system, environment and occupational safety and health) on institutions performance through the dimensions (operational performance and business results), while the study (Faiez , 2018) pointed out that the integration of the requirements of ISO 9001 and ISO 9004 affect the level of performance, (Tariq, 2011) argued that the integration of ISO specifications by dimension (Alexandra, 2012) noted that Integrated Management System improves customer satisfaction and creativity. (Ahmed et al, 2017) explained that Integrated Management System improves environmental performance. (Bernardo et al, 2011)

Integrated Management System in stages reduces obstacles faced by business organizations (Yang, 2018) confirmed the impact of Management Information System on Integrated Management System, (Mustafa,et al, 2016), discussed about the sustainability of Green Management Systems and their impact on the development of organizations,(Zuchi 2005) clarified that the implementation of Integrated Management System leads to optimal use of resources, cost reduction and improvement of communication. (Moneer, 2011) emphasized that Management Information System encourages competition, continuous improvement, and achieves objectives.

(Eman, 2014) argued that Safety, health, environment management systems and improve performance through (production efficiencies and reduction of environmental risks and impacts). (Federica et al, 2018) said that the role of ISO 9001: 2008 requirements in continuous improvement, increasing business results.

While other researchers addressed the impact of Excellence Model on business results such as (Elradi, 2016) dealt with the impact of excellence model on business results.

(Musa, 2012) stated the impact of Excellence Model on business results.

(Maysara & Zahra, 2011) confirmed the impact of Critical Quality Factors on Strategy (Leadership, Strategic Planning, Market Focus, Customer, Measurement and Knowledge Management, Human Resources, Process Management, and Business results)

The following previous studies dealt with core competencies and business results: (Nassir, 2016), the impact of core competencies (efficiency, organizational resources) on organizational excellence (strategic planning, information, analysis, business results)

(Jawad, 2016) reported the impact of core competencies on business results by developing new products and exceeding competitors' performance. (Boazid, 2012)

argued that resources and competencies are an entrance to excellent performance and competitive advantage. So, the present study dealt with human capital efficiency as a mediating variable between the Integrated Management System as independent variable and business results as dependent variable, because the previous studies did not discuss the relationship between those variables.

Study (2012, Bakhtah) and explained the impact of occupational safety and health system and improve the performance and increase the efficiency of workers. And the study (Safar, 2008), which dealt with the role of competencies and expertise in evaluating the performance of quality management system and the environment.

In spite of the role of the environmental management system and its relation to performance, previous studies did not address this relationship according to the researcher's knowledge, as it studied the effect of the application of the environmental management system on environmental performance, according to Francesco Testa (Francesco Rizzi & others, 2014) And its effectiveness in improving environmental performance (Bartholomew & others, 2017) showed that the challenges faced by ISO 14001 application in private and public organizations were in the lack of qualified human resources, practical challenges associated with implementation, lack of systems, support of senior management and high costs and recommended design with an integrated design and delivery approach Implementing and monitoring regulations and policies that effectively promote environmental protection The study found a positive impact on the commitment of senior management to the implementation of the ISO 14001 environmental management system. This result reinforces the importance of participation and support from senior managers in their personal commitment to environmental management and allocation of time and resources to operate and manage the EMS as a result of obtaining ISO 14001 and Ozusaglam (Robin, 2017) have tested whether the adoption of the ISO 14001 environmental management system



increases labor productivity. The second research gap that will examine the relationship is the impact of the ISO 14001 environmental management system .Lovemore (2017) aimed at assessing the impact of OSHAS18001 on safety performance in How Mine, by analyzing occupational accidents before and after OHSAS 18001, assessing the frequency of occupational injury and severity of injury, as well as evaluating safety practices in the Mine. The study (Darko, 2017) that the effect of implementing the requirements in OHSAS 18001: 2007 to reduce the number of work injuries.

### **1.2 Research Questions:**

In order to fill above gaps, the study addresses the following questions:

1. What are the relationship between Integrated Management System and business Results?
2. What is the relationship between Integrated Management System and Human Capital Efficiency?
3. What is the relationship between Human Capital Efficiency and Business Results?
4. Does Integrated Management System Is effect on Human Capital Efficiency in Electricity sector?
5. Does core competences effect on Business Results?
6. Does the Human Capital Efficiency moderate the relationship between Integrated Management System and Business Results?
7. What is the level of application of integrated management system in Elicitiricity Sector?

### **1.3 Study Objectives:**

The study aims to achieve the following objectives:

1. Examine the relationship between Integrated Management System and business Results?

2. Investigate the Relationship between Integrated Management System and Human Capital Efficiency
3. Examine the Relationship between Human Capital Efficiency and Business Results?
4. Examine the effect of Integrated Management System on Human Capital Efficiency in Electricity sector?
5. Investigate the effect of Human Capital Efficiency effect on Business Results?
6. Test the moderating role of Human Capital Efficiency on the relationship between Integrated Management System and Business Results?
7. Measure the level of application of integrated management system Electricity Sector?

### **1.5 Significance of the study:**

This study has both theoretical and practical values, by Provide a basic understanding of the derivation of standards for the protection of health and the environment. Enhance the integration of systems. Operate with environmental and occupational health and safety management systems. Facilitate measurement approaches and processes for the overall management system. Provide a more complete view of the impact of environmental and occupational health and safety programs on performance, thereby facilitating better decision-making.

#### **1.5.1 Theoretical Contribution:**

The importance of theoretical study in that it dealt with the integration of quality management systems and the environment and occupational health and safety and its impact on the development of business results. The topic of Integrated Management Systems is a relatively young topic started about 15 years ago (Alexandra Simon, 2012) and there are no enough studies that contribute to enlarge theory about it. As it is a very narrow topic, with this study Resaercher aim to

contribute to expand, in an exploratory way, the field of Management Systems Integration and expected to add to the following areas of knowledge about .

1. Provides an increased knowledge of the impact of the application of Integrated Management System (IMS) on business results with the presence of Human Capital Efficiency as a mediating variable.
2. Try to fill the gap in the relationship between the variables.
3. Contribute to the knowledge of the best modern, scientific methods for the rehabilitation of productive institutions to implement the Integrated Management System, which proved successful in many international organizations that adopted modern management methods.

#### **1.5.2. The practical Contribution is:**

1. It may contribute to the development of the concept of implementation of the Integrated Management System among leaders and employees by providing them with the knowledge, capabilities and requirements necessary to implement the system.
2. To direct the attention of the leaders of the institutions towards this modern method and the possibility of its use and application at the level of management of these institutions in line with it as one of the most important modern approaches that came from contemporary administrative thought.
3. The study highlights the importance of qualifying an efficient human resource possessing the modern professional expertise, capabilities and functional cadres required.
4. It may contribute to supporting leaders and companies' staff to address the problems and difficulties that impede the implementation of the Integrated Management System and that result in weak product outputs.

5. Contribute to the submission of a model proposal that assists in the implementation of IMS in the business sector.

### 1.6 Operational Definitions

Table (1.1) Operationalization definitions of key terms are detailed in table 1.3 below:

Term	Definition	SOURCES
Integrated Management System (IMS)	A combination of interrelated practices, processes and activities to implement a set of policies within the Quality Management System, Environment, Occupational Safety and Health to ensure effective engagement of the organization's strategy	(zeng et al., 2007).
Quality management system (QMS)	A management system to control an organization with regard to quality, which is to meet customers' expectations and needs with products that fulfill their requirements.	
Environmental Management System: (EMS)	A system to manage and control an organization with respect to the environment, that is to achieve good results in a social context through a good environmental behavior	(ISO, 2012).
Business Results	Are the current achievements of the institutions of the goals and objectives of the planned performance	(Aston, 2001).
Achievement of the objectives:	The ability of the employees at the various levels (strategic, tactical and practical) to achieve the goals of each of them through the optimal utilization of various resources available	
Employee Satisfaction	An expression of the individual's feelings and feelings which can be considered as a reflection of the degree of satisfaction that he receives from this	

	work, the groups he shares and the internal work environment.	
Customer Satisfaction	The impression, reward or non-reward for the sacrifices incurred by the customer upon purchase.	
Human Capital Efficiency	Are a set of knowledge, skills, behaviors and attitudes that are used to improve performance and help employees to perform work efficiently	(Agbada.2013)

Source: by researcher from the previous studies 2018

### 1.7 Study Structure

The study consists of five Chapters; Chapter one is general framework of study contains an introduction, Statement of the problem, Questions, Objectives, Significance of the study, Operational Definitions. Chapter two is theoretical framework provides a literature review of general and classifies on Integrated Management Systems, Quality management system, Environmental Management System, Business Results, Goals Achievement, Employees Satisfaction, Customers Satisfaction, Human Capital Efficiency. Chapter three reviews will present the study framework and the hypotheses that will test the section in methodology highlights the sampling procedures, the measurements of variables, the development of research instrument, the administration of data collection, and the statistical techniques that used and research methodology, Population and sample of the study, designing questionnaire, pretest and variables measurement and Data Analysis Techniques. Chapter four present analyses of collected data and the presentations of the results the study ends with Chapter five that provides discussion of research implications, managerial insights, and directions for future research. The literature review is the focus of next chapter

**Summary of the chapter:**

The chapter presents the phenomena under the study, problem statement, study questions, objectives, theoretical and practical contribution, and operational definitions of terms. The following chapter consist the literature review.

## **Chapter two**

### **Literature Review**

#### **2.0 Introduction**

This chapter provides the theoretical background for the study by reviewing relevant alignment literature and presenting the theory of Management Systems and (RBV) theory; the Chapter is divided into two subsections. The first presents relevant literature, focusing on the Integrating Management Systems and the other looks over business results.

#### **2.1 ISO**

According to (Zutshi, 2005), the ISO 9000 series of quality standards were released by the International Standards Organizations (ISO) in 1987 and they immediately received global recognition. The ISO 9000 was followed by the release of the environmental standards series, ISO 14000 (Environmental Management Systems – EMS) in September 1996. Since then the number of organizations certified to ISO 14000 has increased proportionally to that of ISO 9000. Occupational health and safety (OHS) systems have also been in place in many organizations for a long time, such as the Safety Act of 1984 in Australia or the AS4801:2000 standard, released in January 2000. The safety systems/standards are strictly enforced, especially by the government agencies, to ensure a safe working place for all employees and stakeholders by preventing accidents and thus reducing the number of onsite injuries.

##### **2.1.1 Management Systems:**

Integrated Management Systems in terms of quality, environmental and health & safety management are becoming increasingly seen as part of an organization's management portfolio (Wilkinson & Dale, 2000). An IMS is conceptualized as a

single set of interconnected processes that share a unique pool of human, information, material, infrastructure and financial resources in order to achieve a composite of goals related to the satisfaction of a variety of stakeholders (Karapetrovic, 2003), (Griffith, 2000) argues that an IMS presents an opportunity to establish a cross-functional horizontal management structure illustrates, the management functions become integrated at the strategic level within the corporate organization.

### **2.1.2 Management practices:**

This part of the framework covers three types of management practices among them quality management, ISO 9001 is a quality management system standard used by many organizations, whether in the manufacturing or service sectors. It is preferred by many organizations whose objective is to implement, manage and improve their processes continuously in accordance with stakeholder's' needs and expectations. The main aim of this standard is to ensure the quality of systems in which goods and services are produced. As it can be seen, the ISO 9001 standard is mainly focused on quality issues. The KPIs adapted in this research for the measurement of individual management practices related to specific quality issues are as follows:

1. Top management commitment
2. Customer orientation
3. Quality system processes
4. Human resources applications
5. Supplier relations
6. Process control and improvement

### **2.1.3 Environmental management system practices**

ISO 14001 is an environmental management system designed to manage the environmental impacts of organizations and reduce the environmental risk



associated with organizations activities. Hence, the implementation of ISO14001 has considered one of the most important elements of corporate sustainability. Also the KPIs and influencing factors adapted in this research for the measurement of individual environmental management practices issues are as follows:

1. Top management commitment
2. Collaboration with customers and suppliers
3. Environmental assessment
4. Plans and procedures to identify and respond to environmental accidents
5. A formal, detailed system is used to consider environmental issues in manufacturing process
6. Communication
7. Training
8. Environmental management technical aspects
9. Internal / external audits
10. Environmental accounting / public environmental report.

#### **2.1.4. Occupation Health and Safety practices:**

OHSAS 18001 standard is an occupation health and safety assessment series for health and safety management systems. It is anticipated to help an organization to control occupational health and reduce safety risks. In different researches there is a confirmation on the importance of the occupation health and safety management practices and its close relation to environmental practices and on the overall organizations productivity, the KPIs, and influencing factors adapted in this research for the measurement of individual occupation health and safety management practices related to specific OHSAS issues are as follows:

1. Top management commitment.
2. Safety training.
3. Workers' participation.

4. Safety channel for communication and feedback.
5. Safety rules and procedures.
6. Safety promotion policies.

## 2.2. Integrated Management Systems

The integration of management systems can be defined as “putting together different function-specific management systems into a single and more effective IMS”. Different management systems, and not only the ones related to quality, are considered during the integration process, despite the outstanding importance of quality management systems in the field. Four principal aspects can be identified in the process of integrating management systems: implementation strategy, integration methodology, level of integration and audit integration. (Stanislav et al 2012, p.24) An integrated management system (IMS) combines all related components of a business into one system for easier management and operations. Quality, Environmental, and Safety management systems are often combined and managed as an IMS. These systems are not separate systems that are later joined together, rather they are integrated with linkages so that similar processes are seamlessly managed and executed without duplication.

### 2.2.1. Integrated Management Systems Definition

Table (2.1) Integrated Management Systems Definition

Author		Definition
1	<b>Karapetrovic et al., 2011).</b>	putting together different function-specific management systems into a single and more effective system
2	<b>Sten Abrahamsson et al.,2012)</b>	Management of all relevant stakeholder needs including all suppliers, customers and other interested parties in the supply network
3	<b>Alexandra Simon, 2012</b>	Action and effect of combining or merging the elements of individual MSs. by sharing tools, methodologies, and systematic management of

		different areas, and to comply with the different standards or models governing the management systems
4	<b>Hines F.,2002</b>	A parallelization of the systems using the similarities of the standards to structure the system to reduce administration and audit costs.
5	<b>Arne Remmen et al.2005</b>	Integration in all relevant procedures and instructions, based on Total Quality Management (TQM) approach with focus on employees, customers and continuous improvements.
6	<b>Abrahamsson et al., 2010</b>	Framework for a fully integrated management system based on managing all stakeholder needs and presented as a solution to decrease negative consequences
7	<b>Karapetrovic, 2003</b>	a single set of interconnected processes that share a unique pool of human, information, material, infrastructure and financial resources in order to achieve a composite of goals related to the satisfaction of a variety of stakeholders
8	<b>Theofanis Stamou, 2003</b>	Resources, processes and procedures interact through the structure and culture to carry out the activities of planning, controlling, implementing, measuring, improving and auditing, and transform inputs and outputs. to achieve all needs of interested parties
9	<b>Humberto Giacomello et al.,2014</b>	combination of processes, procedures and practices used in an organization to implement its several management policies.
10	<b>Ahmad Ezzat et al.,2017</b>	framework and developing an evaluation method for the degree of implementation of different management practices that cover different stakeholder's requirement,
11	<b>Zutshi, Ambika and Sohal, Amrik S. 2005</b>	One integrated standard is present instead of two or more different standards/systems, which could be efficiently and understood, implemented, and maintained, especially by its employees depends on a number of factors, excluding the costs, expertise and resources availability.
12	<b>Pedro</b>	Integrated management systems (IMS) state-of-the-art.

	<b>Domingues,et al,2012</b>	
13	<b>Griffith, 1999</b>	The organizational structure, resources and procedures used to plan, monitor and control project quality, safety and environment.
14	<b>Nunhes, et. al, 2016</b>	An IMS is a construction to avoid duplication of tasks that aims to take advantage from the elements common to two or more separate systems, putting them to work together in a single and more efficient IMS

Source: by researcher from the previous studies 2018

So we can say that the Integrated Management Systems definition is: “A framework of policies, standards, processes and procedures used by an organization to ensure that it can fulfill all management systems requirement to achieve its objectives”.

### **2.3. Common Elements of Management Systems**

Simon et al. (2012) mentioned that most management systems have similar common elements. (Mohammad. Mustaphaa.o.et.al, 2016) added that PDCA cycle model has become the foundation to develop the integrated management system. Within PDCA cycle, the common elements include (1) Policy, (2) Responsibility and authority, (3) Monitoring, measurement and analysis, (4) Documentation, control of documents, operational control, (6) Internal audit, nonconformities, correction, corrective action and preventive action, and (6) Management review. Next, each of the aforementioned elements is described in detail, and the similarities that exist among relevant ISO Systems are analyzed.

#### **2.3.1. Policy.**

A policy is a document that must be owned by any company or organization in implementing any management system standard. Policy is a formal and written statement of the top management of the organization about the company's commitment to pay attention and consider aspects of specific areas depending on

the main objectives of the management system. For example, in Quality Management System, clause 5.3 on quality policy emphasizes on quality issues and in Environmental Management System, clause 4.2 on environmental policy emphasizes on environmental issues. Policies must be consistent throughout the organization, because it provides a framework for establishing objectives for management systems. In addition, Bhardwaj (2016) in his study found out that a comprehensive green policy would enhance an organization's sustainability. In this point of view, for an integrated management system that aims to cater for sustainability, the policy should be a unified approach which emphasizes on elements for sustainability. For example, if an organization is planning to integrate both ISO 9001 and ISO14001, the policy should be a written declaration by the top management of the organization about the company's commitment to pay attention and consider aspects of quality and the environment. A single policy that emphasizes on both quality and the environment would be consistent throughout the organization and easier for internal organization to understand rather than two policies which would divide the focus of the organization and cause confusion among internal organizations. Nevertheless, a policy must include commitment to meet the requirements and to continuously improve the effectiveness of the management system. A policy is not only a written document but must be widely communicated and understood internally by organizations, and be continuously reviewed for compliance with organizational activities.

### **2.3.2. Responsibility**

On the responsibility and authority element, top management must establish organizational structure parallel to the adopted management system. Responsibilities, duties and authority of every person in company for each task are defined clearly and communicated with others. Confusion about responsibilities and authorities could have an impact on the quality of goods or services. Unclear

job descriptions would lead to work delays, stress of the person in company and ultimately reduced productivity. Each task in the organization should have a clear degree of authority. Therefore, personnel of higher authorities would carry more responsibilities, while those of lower authorities carry fewer responsibilities. Most ISO standards would have a similar clause to reflect the elements of responsibility and authority. For example:

- ISO 9001 clause 5.5: Responsibility, authority and communication;
- ISO 14001 clause 4.4.1: Resources, roles, responsibility and authority and;
- ISO50001 clause 4.2: Management responsibility.

Some of the methods to define and document aspects of responsibility and authority include the use of organization charts, job descriptions and standard operating procedures (SOPs). It is difficult for organizations and for the person in charge to have a different set of job descriptions and SOPs. For example, a process that implements two management systems will typically have at least two sets of SOPs. Nonetheless, at the implementation stage only one process is involved. It would be difficult for the person in charge to follow both SOPs at the same time as this would lead to confusion and impact the quality of goods or services. Thus, having a unified job description that encompasses all sustainable management system requirements for similar processes is practical, and promotes clear responsibilities, duties and authority for every person in charge of each task. This would lead to social sustainability which values human capital by providing a safe and healthy working condition and improve economic sustainability by utilization of the available assets of an organization effectively and efficiently.

### **2.3.3. Monitoring, measurement and analysis.**

The purpose of monitoring, measuring and analyzing is to ensure that all processes are carried out under the control specifications and closely follow the required regulations. The monitoring process is carried out to ensure that the output is

according to plan. On the other hand, the measurements and analysis function to determine the effectiveness of the process thus are enabling a facility manager to find opportunities for improvement. Monitoring, measurement and analysis play a significant role in sustaining the environmental, economic and social elements. This is the stage where the environmental, economic and social plan with statements in the policy is compared with the output of the product or service. This is also the reason why in every ISO management system, monitoring, measurement and analysis are required. Although the basis to carry out monitoring, measurement and analysis in every ISO management system is similar, there are some slight differences in terms of documentation and implementation in some management systems. For example, in OHSAS 18000 clause 4.5.1, the measurement is in terms of procedures faster with clear documented guidelines. However, multiple documentations due to adoption of more than one management system would cause confusion as a result of unclear guidance. It also causes redundancy because each management system would have different documentations as in manuals, procedures and work instructions although it is for a same process. This would make the controls of documents and operations—the elements in management system—not work smoothly. This is because multiple documentation would need multiple personnel to monitor and record. Each document needs to be recorded in each management system database record and the operation controls would be different in every work instruction or standard of procedure even though it is the same process. Although it can be done by the same person, the probability to make a mistake is higher. Although adopting multiple management systems to suit sustainability elements would require different documentations, it can be combined together by integrating the documentations in policies, manuals, standard operation controls or work instructions. For example, for work instructions, the form could be integrated by including the instructions for

tolerance of product for quality management systems. Other examples include raw material consumption limitations to reduce pollution for environmental management systems and machine operating hours limitation to reduce electricity consumption for energy management. By integrating the three criteria, the organization would be in line with sustainability, and compliant with three ISO standards. In addition, such integration would reduce the redundancy of records for nonconformities, correction actions, corrective actions and preventive actions done in the same process which is one of the important elements for management systems. In ISO 14000 clause 4.5.1 the measurement is in terms of how we control our processes related to environmental pollution and the resource saving. In ISO 9001 clause 7.6, the measurement emphasizes on the measuring equipment, processes, products, and analysis of data. Although there are differences, it still can be combined into one procedure by adding all the required measurement and monitoring in the work instructions, standard of procedure and any other documentation related to the process involved.

#### **2.3.4. Documentation**

Documentation is one of the important elements in any management system because it provides a written guide on how organizations should operate. In ISO 9001 clause 4.2.1, it required organizations to have documentation about quality management systems or named as Quality Manual, while in ISO 14001 clause 4.4.4, it required organizations to have documentation about environmental management systems. Documentation can be in the form of policies, SOPs, flowcharts, work instruction forms, checklists and record of corrections and preventive actions. For example, with the organization's policies, manuals and procedures, every personnel or employee has a clear understanding about what must be done, what is prohibited, how, where, and when activity is done. With this in place, the functions of each personnel and department within the organization



can operate according to the plan and at the same time achieve organizational goals. Nevertheless, new employees will learn and adapt to organizational

### **2.3.5. Internal Audit.**

Internal audit is the evaluation of system, process, or product of the organization. Internal audit is carried out by the competent, objective, impartial, and independent organization personnel named as the auditor. The goal is to verify that the operations of the organization are in compliance with the adopted management system. The audit findings are very important where it does not only identify the criteria that are not being met but also identify the best solution for improvement opportunities. Luthra et al. (2016) also mentioned that the internal management plays a vital role for an organization to achieve the intended performance outcome. Before any audit can be done, an audit program must be declared and notified earlier to the auditee. Although most ISO standards require internal audits to be conducted a minimum of once a year, the process of auditing requires human resources to plan, organize and conduct internal audits. In addition, internal audits require a lot of time to be conducted due to the involvement of both auditor and auditee during the interview and checking of documents and records. This would be difficult for any organization who adopted multiple management systems for sustainability, due to the increased need of human resources, as more time will be spent on audits and more costly as well. Thus, auditing multiple management systems at one time is only possible when the policy, standard of procedure, work instruction and records of nonconformities, correction action, corrective action and preventive action documentation are all integrated together. This integration would reduce human resources, reduce audit time and less implementation cost.

### **2.3.6. Management Review**

A management review is an activity that is carried out periodically to evaluate the management system. The purpose is to assess the effectiveness of the system and

to ensure continuous improvement. Management reviews are not the same as the internal audit. Internal audit is part of the agenda of management review. In practice, organizations usually implement the management review through management review meetings. ISO 9001 clause 5.6.2: input review, listed the agenda that needed to be reviewed in the meeting such as result of audits, customer feedback, process performance and product conformity, status of preventive and corrective actions, follow-up actions from previous management reviews, changes that could affect the quality management system and recommendations for improvement. Although in the other ISO standard management systems the listed agenda were for the specific areas, the basis is still the same. For example, in the Environmental Management System, review of environmental performance is similar to the review of process performance as in Quality Management System. Although the list of agenda would be more than reviewing a single management system, it is more rational to be done in such a way compared to conducting multiple meetings for each management system.

#### 2.4. Conclusion of IMS dimensions:

Table (2.2).Proposed maturity scale for the level of integration. (Sten Abrahamsson et al.,2012)

Author		Dimensions			
		9001	14001	18001	Others
1	Karapetrovic et al., 2011).	•	•	•	
2	Abrahamsson et al.,2012)	•	•	•	
3	Alexandra Simon, 2012	•	•	•	
4	Bakhtah Hadar (2012)		•		
5	Arne Remmen et al.2005	•	•	•	SA8000
6	Abrahamsson et al., 2010	•	•	•	
7	Karapetrovic, 2003	•	•	•	
8	Theofanis Stamou, 2003	•	•	•	

9	Humberto Giacomello et al.,2014				
10	Ahmad Ezzat et al.,2017	•	•	•	
11	Zutshi, Ambika and Sohal, Amrik S. 2005	•	•	•	
12	PedroDomingues,et al,2012	•	•		
13	Jorge Pereira et al,2011	•	•		
14	Yang Sui et al,2018		•	•	
15	Eman Hosseini, 2014		•	•	
16	Mohammed Yousif Abdullah, 2017	•	•	•	
17	Mounir Siddiq,2011	•	•		
18	De Araujo, 1996	•	•		
19	Mubarak, 2012	•	•		
20	Al-Saffar, 2008	•	•		
21	Faysal Bashir Mousa,2015	•			
22	Federica Casolani & others , 2018	•			
23	Al-Dulaimi (2001)		•		
24	Ali Göksu,2014	•			<b>HEA</b>
25	Faiz Ghazy,2018	•			9004
26	Joseph Mathew2007		•	•	

Source: by researcher from the previous studies 2018

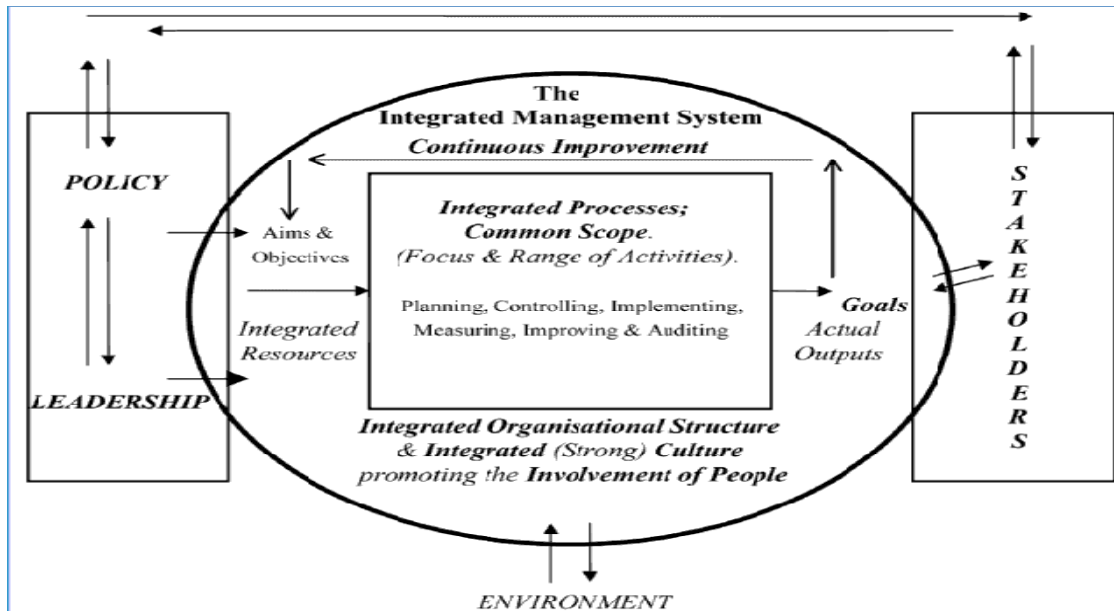


Figure (2.1). A model of an integrated Quality, Environment, and Health and Safety Management System based on a Total Quality approach(Theofanis Stamou, 2003)

## 2.5. IMS Benefits:

### Benefits of adopting Integrated Management Systems

Many advantages can be obtained by adopting Integrated Management Systems, by review and analysis of previous studies on the subject of the implementation of Integrated Management System; it can be argued that the benefits can be grouped into two categories: internal benefits and external benefits. The internal benefits are related to the internal function and processes of the company, while the external ones are associated with the external activities of the company. Furthermore, internal benefits can be divided into three categories: organizational, financial and people benefits. Similarly, the external ones are grouped into commercial, communication and quality/environmental/safety (Q/E/S) benefits. The improvement of internal efficiency and quality of management is the first internal outcome, and the harmonizing of the organizational structures which contain similar elements. The latter is also highlighted by Renzi & Cappelli (2000), who state that an integrated system allows homogeneity in management methodologies. In the same way, Griffith (2000) argues that the integration of

systems results in the reduction in the fuzzy management boundaries between individual systems and in the broadening of the horizon beyond the functional level of any individual systems, by sharing information across traditional organizational boundaries. What is more, as stated in the introduction, many of the standards (i.e. ISO 9000:2000, ISO 14001, OHSAS 18001) deliberately share the same elements and therefore their integration will enable the company to avoid duplications between procedures of the systems and to eliminate the overlap of effort, for instance, in terms of hazard identification, development and maintenance of controls required, auditing, etc (Winder, 2000; Griffith, 2000; Carter, 2000). Finally, many writers (e.g. Renzi & Cappelli, 2000; Griffith, 2000) also recognize the decrease in the bulk of company papers and the creation of common forms that can be more easily used by several operators, as a significant tangible organizational benefit. Apart from the above described organizational benefits, SMEs can also obtain a range of financial rewards. The cost savings, which will occur from the cutting of the frequency of the audits, are acknowledged throughout the literature (see for instance Shillito, 1995; Winder, 2000; Matias & Coelho, 2002). However, Shillito (1995) argues that the audits will not be reduced to just one, as it will be necessary to expand the internal financial audit program, in order for the effectiveness of the integrated procedures to be secured. In addition, the economic condition of the SME will be improved as a result of the minimizing of the external certification costs over a single certification audit (Barden & Bannister, 2002), and as a consequence of the enhancement of the data and personnel management (Renzi & Cappelli, 2000). Hillary (1999; 2000) points out that the adoption of Environmental Management Systems by small and medium businesses increases employee motivation, awareness and qualifications. As one might expect, this argument can be also applied to Integrated Management Systems, as the latter preserves not only the external environment but also

safeguards the internal one through the Health and Safety Management Systems. Consequently, employees can enjoy better and safer working conditions, which create a better company image among them and improve the relations between staff and management.

Table (2.3) Benefits of Integrated Management System

<ul style="list-style-type: none"> <li>• improvement of internal efficiency and effectiveness</li> <li>• homogeneity in management methodologies</li> <li>• the reduction in the fuzzy management boundaries between</li> <li>• individual systems and in the broadening of the horizon</li> <li>• beyond the functional level of any individual</li> <li>• avoid duplications between procedures of the systems</li> <li>• eliminate the overlap of effort</li> <li>• Reduction in external certification costs over single.</li> <li>• certification audits alignment of objectives, processes, resources in different areas</li> <li>• positive for small business</li> <li>• reducing paperwork</li> <li>• synergy effects</li> <li>• elimination of effort and redundancies</li> <li>• a holistic approach to managing business risks</li> <li>• improve internal and external communication</li> <li>• reduce risks increase in profit margins</li> <li>• improvement of quality of management by down-sizing</li> <li>• three functional departments to one and reducing fuzzy</li> <li>• management boundaries between individual systems</li> <li>• increase in operational efficiency by harmonizing</li> <li>• organizational structures with similar elements and sharing</li> <li>• information across traditional organizational boundaries</li> </ul>	<ul style="list-style-type: none"> <li>• streamlining paperwork and communication</li> <li>• less redundancy and conflicting elements</li> <li>• time saving</li> <li>• more transparency more feasibility</li> <li>• better structured processes</li> <li>• clearer responsibilities</li> <li>• harmonization of MS documentation</li> <li>• responsibilities and relationships</li> <li>• gain a structured balance of authority/power</li> <li>• Expose conflicting objectives</li> <li>• identify and rationalize conflicting</li> <li>• focus organization onto business goals</li> <li>• create a formalization of informal systems</li> <li>• harmonize and optimize practices identify and facilitate</li> <li>• Staff training and development</li> <li>• reduction of coordination problem</li> <li>• improved operational performance</li> <li>• cross-functional teamwork</li> <li>• motivation of staff</li> <li>• enhanced customer confidence</li> <li>• simplified systems resulting in less</li> <li>• confusion, redundancy or conflicts in documentation</li> <li>• optimized resources in maintaining a single system with a Single</li> <li>• simplification of requirements</li> <li>• integrated audits</li> </ul>
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Marieta OLARU

**2.6. IMS Difficulties:**

Overall, very few empirical studies have examined the integration of management systems (Karapetrovic and Casadesús, 2009). No empirical studies were found that specifically focus on the obstacles encountered during the integration process, although in the empirical studies the difficulties are analysed as a part of the process. For example, Zutshi and Sohal (2005b) analyzed the integration process identified the benefits and the barriers encountered as:

- People’s attitudes: resistance to change the present situation.
- Lack of strategic planning: mean that resistance and delays.
- Lack of expertise and use of consultant’s.
- Lack of qualified personnel and high fees not all organizations can afford.
- Continually changing regulations and guides.
- Challenge of updating and reviewing the IMS.
- Reporting of results to ensure a fast reporting system to avoid delays.
- Time-delays in integration.
- Lack of employees training that need more time than expected) (Zutshi and Sohal, 2005b).

Table (2.4) IMS Difficulties

<p>External Standards</p>	<ul style="list-style-type: none"> <li>• Insufficient harmonisation of the standards from the ISO 9000 and ISO 14000 series</li> <li>• MSSs are based on two different models, i.e., the “process-based approach” of ISO 9001 and the “PDCA cycle” of ISO 14001, OHSAS 18001 and SA 8000, which are</li> <li>• incompatible to some extent Differences in the general elements of the standards and in their specific requirements</li> </ul>	<p>Karapetrovic, 2002a, 2003; Beckmerhagen et al., 2003) (Karapetrovic, 2003; McDonald et al., 2003; Salomone, 2008). (Matias &amp; Coelho,</p>
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		2002;
Consultants	Lack of experience and use of consultants, particularly the difficulty of finding qualified consultants, as well as the lack of the ability to pay for and devise adequate training to maintain the implemented system	(Zutshi and Sohal, 2005b)
Certification bodies	Lack of support from the certification	bodies (Zeng et al., 2007; Salomone, 2008) Internal
Internal Systems	Differing perceptions of who the main stakeholders are, given that those are parties who receive a product or service in the QMS (i.e., customers as defined in ISO 9000: 2005), but in the EMS they are the society at large, local communities and the government	(Karapetrovic and Willborn, 1998a; Beckmerhagen et al., 2003; Zeng et al., 2007; Asif et al., 2009).
Resources	Risk of creating a ranking of systems by different areas of responsibility Resources People's attitudes, given that the behaviour and the attitude of workers can affect the successful implementation of the system	(McDonald et al, 2003; Salomone, 2008,.(Matias and Coelho, 2002; Zutshi and Sohal, 2005b; Zeng et al., 2007; Asif et al., 2009).
Organisation	<ul style="list-style-type: none"> <li>• Loss of power by some roles in the hierarchy</li> <li>• and fear of job losses</li> <li>• Inter-functional conflicts, given that interests and motivations differ</li> <li>• Lack of knowledge of the process, resulting in integration delays caused by the need of departments</li> </ul>	(Matias and Coelho, 2002; Karapetrovic, 2002a) (Beckmerhagen et al., 2003).



	<p>for more time to</p> <ul style="list-style-type: none"> <li>• understand and implement the integrated system, which then affects the execution of the entire implementation (Wilkinson and Dale, 2000; Zutshi and Sohal, 2005b;</li> <li>• Problems related to the organizational</li> <li>• culture (Increased bureaucracy, which will be more complex in an IMS as a result of the interconnectedness of the systems</li> <li>• Difficulties after the IMS implementation, which may be caused by ineffective design or implementation affecting the</li> <li>• flexibility of the organisation</li> </ul>	<p>(Karapetrovic and Willborn, 1998a). Zeng et al., 2007; Salomone, 2008). Wilkinson and Dale, 1999c, 2000; Zeng et al., 2007). (Matias and Coelho, 2002; McDonald et al., 2003). (Asif et al., 2009).</p>
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Source: Adapted from M. Bernardo et al. (2012).

## 2.7. Challenges/impediments accompanied by integration

Even though the three companies interviewed did not experience all the impediments listed below, these are nonetheless recognized as potential challenges commonly experienced by companies integrating their management systems. The challenges/impediments include:

- People’s attitudes. behavior and attitudes of the employees within the organization can act as a determining factor for successful integration of the systems and its maintenance. It is common knowledge that nobody likes to change their old ways of doing things and implementing new systems or even updating existing procedures can involve substantial change. It is thus sometimes both challenging and frustrating for people to communicate and explain their system requirements to others and explain how their systems may be best integrated with the other systems. Some resistance is thus to be expected during integration of the systems, which can generally be addressed by educating and training the employees. Some resistance may also be

experienced from people who lose “ownership” of, for instance, forms or procedures resulting from integration of the systems.

- Lack of strategic planning. Companies that lack a formal long-term “strategic plan” can experience resistance and delays in the completion of the integration of their systems. Due to communication gaps between the top/middle management and employees of the aspects of the integration process, resistance would be experienced within the various management levels.
- Lack of expertise and use of consultants. One of the most common challenges faced by a number of companies when integrating its management systems is the availability and/or lack of qualified personnel to complete the job. Many times when the companies are able to find an expert in the area, paying them appropriate salaries becomes an additional challenge/problem for them due to lack of, or limited, resources, once again restricting them from recruiting such a person. Consultants are generally used by a number of organizations to implement their management systems. One of the problems associated with the use of consultants is the very high fees charged by them and many organizations, particularly SMEs, are unable to pay the consultation fees over an extended period of time. Another disadvantage of using consultants is that even though they can implement the systems, they cannot assist the organization in maintaining these, which has to be done by internal people. In the view of the interviewee, it is thus preferable and recommended that the system is implemented and maintained internally by the organization.
- Continually changing regulations and guidelines. Due to the continually changing regulations and guidelines, for instance in the environmental field, organizations are faced with the challenge of updating their procedures and systems. These changes consequently force the organizations to continually review their procedures, targets and objectives and update them accordingly.

- Reporting of results. To avoid delays in the finalization and facilitation of the future improvement plans, the company's top management needs to receive and review the progress/audit reports promptly. For this to be successful, managers should ensure that there exists a fast reporting system across the organization and its national subsidiaries around the globe.
- Time-delays in integration. Some departments within the company could take more time than anticipated to initially understand and implement the integrated system. This could delay meeting the target completion date set by the management. Nevertheless, this possibility needs to be considered and taken into account when finalizing the target dates. By being aware of some of the challenges experienced by companies within the same or different sectors, organizations contemplating integrating their systems can accordingly prepare themselves to meet and address these challenges, thus making the implementation of the systems and their integration faster and smoother.

## **2.8. Integration achieved**

Time and again it has been proven that “operating a QMS and an EMS as two separate systems is wasteful and redundant [and] integration is the key to streamlining an organization's operations and realizing maximum efficiency” (Wilson, 1999). As with any other system or standard adoption and implementation, the role of top management (commitment, communication, support, funds, leadership) is equally crucial and inevitable in the case of integration too. Top management's responsibility does not end once the decision to integrate the systems has been finalized, rather it begins from here, as to be successfully implemented, completed and maintained, their contribution needs to be continuous or on-going. Here “on-going is the key word because once the project is underway, the constant support and leadership of the organizations’ chief decision makers are crucial for the project to evolve” (Wilson, 1999, p. 33). The

literature also highlights various levels of integration that can be achieved within an organization depending on its individual requirements. Examples of four levels each has been provided by Wilkinson and Dale (1999a) and Douglas and Glen (2000, p. S687) based on their descriptive and empirical research. If organizations want to procure benefits from the integration of quality, environmental and OHS systems/standards then the management can choose any one of the following strategies to integrate QMS, EMS and OHS successfully according to their respective systems or operations (Jackson, 1998, p. 66; Karapetrovic and Willborn, 1998, p. 694; Karapetrovic and Willborn, 1998, p. 208; Lawrence and Andrews, 1998, p. 243; Wilkinson and Dale, 1999a, p. 95; b, pp. 281, 282; Douglas and Glen, 2000, p. S687; Chandran and Chidambaram, 2002, p. 64):

1. Establish QMS first and subsequently EMS.
2. Establish EMS first and subsequently QMS.
3. Establish EMS and QMS simultaneously.
4. Strategy deployment.
5. Implementation of a system throughout the whole organization.
6. Combining of systems through structural similarities.
7. The use of a separate system to deal with activities such as training, which are common elements in other systems.
8. Integrating all the systems existing within the organization irrespective of whether or not they are certified, leading to a complete, truly integrated management system (IMS).
9. A combination of the points (5) to (8) above, with the policy and objectives of each system aligned to and supporting the overall company policy. Depending on the size and nature of the company and its culture and resources available, it can use one or more methods to integrate its existing management systems.

## **2.9. Integrated management system compound performance measurement :**

Measuring integrated management system performance means measuring performance from three perspective quality, OSH, and environment, which in turn lead to need to use of multi dimensional set of performance indicators to measure the organization performance in the three areas, in order to satisfy organizations multi stakeholder requirement.

David Parmenter (2007,p1) indicated that there are three type of performance measure, key result indicators (KRI) tell you what to do, performance indicators (PI) tell you what to do, key performance indicators tell you what to do to increase performance dramatically. Many performance measure used by organization are thus an appropriate mix of these three types.

The main objective of integrated management system is to help organization to improve its performance in the three mentioned area, which is differ in their used indicators to trace each system performance, beside its specific requirement, the three system require compliance with regularity and other related standards specific to specific to each system, and to specific requirement of each system.

Organization performance is judge by type of performance information used Jarvis (2000,p) show that there are several type of performance used include:

- a) Ratios of inputs to outputs that tell how well the organisation utilises resources, in other word, productivity and efficiency;
- b) Measures of effectiveness that measures the degree to which the organisation is achieving its goals; and
- c) Standards, which are measures of quality achieved.

Organization also may measure level of customer and employee satisfaction, innovation and environmental impacts. IMS require organization to formulate policy, setting objectives and targets, measure its performance. The ideal IMS

performance is achieved when performance is in line with, organization KPI, IMS objectives and targets, and regulatory compliance.

According to It is rare to find an organization that doesn't have problems with its performance measurement system. Some may need only simple fixes while others may need major overhauls. However, learning from and avoiding others' mistakes is a wise thing to do. Here are some of the mistakes other organizations have made. Don't let one of them be the pitfall of your measurement system.

1. Amassing too much data - It results in? information overload." So much so that managers and employees either will ignore the data or use it ineffectively.
2. Focusing on the short-term - Most organizations only collect financial and operational data. They forget to focus on the longer-term measures.

## **2.10. Lessons learned during integration**

The major lessons learnt. mentioned by (Zutshi,et al 2005) can be used as guidelines for organizations currently undertaking or contemplating integrating their management systems:

- **Top management commitment**

The company needs to have "top management commitment" to do so. Top management commitment must be in the form of hands-on involvement in all phases of the integration process. The leader must personally be involved in communicating the company's goals and plans and in motivating and rewarding the employees. Top management must be seen by the rest of the employees to be totally committed and involved. This commitment is also true for implementing individual management systems. The motivation for top management to provide commitment should come from the saving of resources and reduction in costs that will result from operating an integrated system. Top management support and commitment is thus essential for the integration process to be initiated, completed

and subsequently maintained within the organization. The managers consequently need to recognize that for the integrated system to be implemented and maintained, they must continuously push it forward. For the maintenance and progress of the system it is also necessary that a management review is held regularly with key personnel representing management from across the organization, The problems being experienced with the operation and maintenance of the system need to be reviewed at this meeting along with the results of the internal audits. These management review meetings should also discuss the overall direction of the company and set long-term targets to be achieved by the company. “you need to make sure that you have a regular \*management+ review that goes over and looks at where you were, where you are now and where you want to go to, so that you actually set direction”.

- **Appointing a champion**

Companies stressed on the appointment of a “champion” as management representative within the organization for the successful implementation and maintenance of an individual or integrated system. Necessarily, the person appointed in this position must be a representative from the middle to top management level, someone who, to takes directives \*from+ senior management and puts them in place so that people at the lower levels of the organization can use them \*directives/systems+ to \*deliver+ the services”, in other words carry out their jobs/tasks effectively. The essential skills that this person must have include being a good communicator, negotiator, coach and trainer.

- **Training**

Both companies A and C found “training” as an effective way to reduce anticipated impediments before they were experienced. Organizations thus need to allocate sufficient resources for the purpose of providing adequate training for all their

employees. The aim of the training program should be first to provide awareness for the need for and the benefits of an integrated system, and second how the integrated system would be implemented, utilised and maintained. It has been shown again and again that employees' understanding and involvement results in eliminating employee resistance to the change initiative. Company C, as a means of increasing understanding of the systems and reduce resistance, is currently training its employees to do internal audits, so that they "have knowledge about the system". This was also highlighted by the interviewee from company C as a means to "empower people \*so that+ the more people know about the system and can use it, then that will make them better people for the organization [and it will provide] more skills [for the employees] and the skills won't be just what the systems are, the skills will be communication, like talking to people, asking the questions in a certain way, getting information, so it will be double-folded".

For both the individual systems or an integrated system to be successfully implemented and maintained, it is essential that all personnel are trained regularly in the new systems and procedures and this was emphasized by all the three companies interviewed. This training is especially required during the early stages of the implementation process and if possible even before the actual implementation stages, depending on the type of organization and the skills of its employees. In some instances "refresher courses" may be required to reemphasize the understanding of the individual system(s) and/or integrated system. To be effective, this training should include "small lectures \*as well as+ taking people on specific site tours". Methods such as site-tours would "reinforce the fact that they \*employees+ are living in a natural environment" with other species of plants and animals and thus it is essential to maintain that natural environment. Once the systems have been integrated, the training should reflect the same, that is, integration of procedures and systems. The interviewee from company A stressed



this point by giving the example of a “spill training” program. In the view of the interviewee, spills are associated with regulatory issues (for instance what impact is the spill going to have on a product and contamination of other products). There are also the OHS aspects of spills, as they are dangerous and people can get hurt themselves. From an environmental point of view spills are risky because if they get into drains, the organization can have regulatory/compliance issues.

- **Skilled employees and resource utilization**

For the integrated system to be implemented, practiced and maintained the company requires “skilled employees ... people who know a lot and are and skilled and empowered”. This point enforces the importance of training and communication for all employees. To have skilled and empowered employees, it is essential that the companies continually train their employees in new procedures, systems and technologies and involve them in the decision-making process. This would ensure that the employees understand both “the product \*and+ the importance of the system” being implemented. The importance/significance of training as a way to empowering its employees was indicated by the interviewee from company C in the following words, “you can get the managers all inspired and you can get the employees all inspired but if you don't give your employees the right sort of tools... you basically fail as well”. Implementing and maintaining an integrated management system not only requires resources such as skilled and empowered employees, dollars and management time, more importantly it is also important in the view of the interviewee from company C “to be able to utilize \*these+ resources in the best way possible”.

- **Documentation system/control**

One of the key impediments faced by many organizations is the maintenance of their documentation system. This documentation system needs to be highly controlled so as to avoid duplication of procedures that may result in confusion

among the employees. According to the interviewee from company A, if an organization does not have “a system for recording things directly and with a proper sign-off and the control of those documents, [they] can't drive the management system”. The interviewee further commented that this documentation system may or may not be electronic in nature, depending on the size of the organization and the resources available; however, it is preferable to make it electronic. Having a controlled electronic document management system would ensure that all personnel within the organization are able to refer back/view the three or more management systems being integrated. The current/valid documents thus need to be appropriately approved, numbered and issued, with obsolete documents being removed from the electronic system. Nonetheless, the master copy of the obsolete documents should be kept for future reference and audits. The same views were also reflected by the interviewee from company B, according to whom it is not adequate solely to implement the changes, it is also essential that the changes are documented and maintained.

- **Auditing and addressing of waste issues**

The organization needs to have regular internal and external audits of its systems and processes. This auditing system should be “secure and reliable \*and+ everybody in the organization \*should be+ comfortable with”, it as viewed by the interviewee from company A. The auditing should cover all management systems including the housekeeping (which may be part of the OHS system) of all the areas and departments within the organization. The frequency of internal audits, however, will be dependent on the type of system implemented. The interviewee from company A also indicated that the management systems “will die very quickly” if not audited regularly “by a combination of senior people \*and+ people across different areas of the organization”. A multi-disciplinary team approach

would emphasize the significance/importance of the audits to the rest of the employees and get their commitment. In addition to saving of resources, conducting integrated audits would also help the organization obtain a holistic view of the improvements required across its various departments. Wastes produced from organizational processes, collected either on-site or sent for recycling or landfill, also need to be regularly audited. The level of waste produced and the effort needed to address this could also be used for training and educating the personnel of the impact of the company's operations on the ecological environment, once again reinforcing the message to reduce the impacts and protect the environment by reducing the usage of raw materials and saving of resources.

**Change culture and avoidance of personality clashes** To integrate management systems across departments it is crucial that personality clashes be avoided and people put their egos behind. This was highlighted by all three companies. The interviewee from company C commented that, “if Australian manufacturing or Australian businesses wants to be competitive in the rest of the world, you have to look at smart ways of doing things and you can't have people building empires and you can't have big egos”. This requires managers and the employees working together. To implement various management systems individually or to practise an integrated system it is also essential that the organization has a “culture that's willing to embrace change” as commented by the interviewee from company C. This culture, as recommended by the interviewee, starts from the top of the organization and spreads throughout the organization. Being “innovative” and “open-minded” about the changes taking place is also required by the organization, for integrating the systems.

**Working with suppliers** By educating and working with the suppliers, a company can have positive effects on its quality, environmental and OHS systems or its integrated system. The interviewee from company A gave the example of a supplier supplying soap in 44 gallons drums.

Earlier, the company, on receiving the drums, had to sample its contents and on the usage of the product transport the empty drum back to the supplier. By closely working with its suppliers, the company has made an annual savings of \$80,000 and has reduced the number of manual handling actions needed for transferring the materials from the drums. Also the supplier now takes back the drums when empty.

- **Communication**

Communication was found to be the most effective way to overcome a number of different challenges. Company C had encouraged and spread the message of the significance and benefits attached to effective utilization of resources and integration of systems. This awareness and communication has been especially effective in light of the nature of business – manufacturing, which must remain “mean and lean” (Ayres et al., 1997) and for which it requires understanding across the various departments. Keeping in mind these recommendations, it is expected that these organizations would encounter/experience fewer challenges during their integration process.

### **2.11. Integrated Management System compound performance measurement:**

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Organization performance is judged by the adopted type of performance information. Jarvis (2000, p. ) showed that there are several types of performance include:

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Organization also may measure level of customer and employee satisfaction, innovation and environmental impacts. IMS require organization to formulate policy, setting objectives and targets, measure its performance. The ideal IMS performance is achieve when performance is in line with, organization KPI, IMS objectives and targets, and regulatory compliance.

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is a wise thing to do. Here are some of the mistakes other organizations have made. Don't let one of them be the pitfall of your measurement system.

1. Amassing too much data - It results in? information overload.” So much so that managers and employees either will ignore the data or use it ineffectively.

2. Focusing on the short-term - Most organizations only collect financial and operational data. They forget to focus on the longer-term measures.

3. Failing to base business decisions on the data - A lot of managers make decisions based on intuition and past experience rather than the data being reported to them. If the data is valid, it should be used appropriately.

4. Dumping” the data - Sometimes data can be summarized so much that it becomes meaningless. If business decisions are going to be based on the data, then the data needs to be reported clearly and understandably.

5. Measuring too little - Making business decisions with too little data is just as problematic as basing them on too much data. Some organizations (particularly smaller ones) tend to measure too few key variables to get the whole picture” of the health of their organization. Mostly, their focus is on financial indicators.

However, as with Number 2 above, there needs to be focus on longer-term measures, such as customer and employee satisfaction and market share.

6. Collecting inconsistent, conflicting, and unnecessary data - All data should lead to some ultimate measure of success for the company.

7. Driving the wrong performance - Exceptional performance in one area could be disastrous in another.

8. Encouraging competition and discouraging teamwork - Comparing performance results of organizational unit to organizational unit, or one employee to another.

9. Establishing unrealistic and/or unreasonable measures - Measures must fit into the organization's budgetary and personnel constraints and must be cost-effective.

They also must be achievable. Nothing can demoralize an employee quicker than a goal that never can be reached.

10. Failing to link measures - Measures should be linked to the organization's strategic plan and should cascade down into the organization (horizontal and vertical linkage). Measures without linkage are like a boat without water. They're useless and they're not going anywhere.

11. Measuring progress too often or not often enough - There has to be a balance here. Measuring progress too often could result in unnecessary effort and excessive costs, resulting in little or no added value. On the other hand, not measuring progress often enough puts you in the situation where you don't know about potential problems until it's too late to take appropriate action.

12. Ignoring the customer - Management often wants to measure only an organization's internal components and processes. That way they can command and control" it. However, in reality, it is the customer who drives any organization's performance.

13. Asking the wrong questions/looking in the wrong places - Sometimes business executives ask who's too blame instead of asking what went wrong. They look for the answers in the people instead of the process. A faulty process makes employees look faulty.

14. Confusing the purpose of the performance measurement system - The purpose of a performance measurement system is not merely to collect data but rather to collect data upon which to make critical business decisions that will in turn drive business improvement.

## **2.12. Business Results:**

Achieving the objectives as "the extent to which the organization achieves the goals set for it, or the achievement of the objectives" as the process of analyzing and measuring the performance over a time while the performance evaluation is

defined as "identifying the achievement of the organization objectives." (Drucker, 1964) noted that all the definitions refer in general to the concept of management objectives "Management Base Objectives", one of the most important intellectual trends that spread in the seventies of this century and focused on the concept of performance evaluation and also defined the achievement of objectives consists of the following steps:

- Strategic process adopted by the institution in order to determine the difference or what is known as the performance gap between what is applied and what is planned.
- Carried out using a set of criteria, indicators and measures.
- Draw conclusions to reduce the gap and improve performance over the coming period.
- It also helps to update and modify new goals for the institution that facilitate their achievement without creating performance gap.

Objectives of the Institutional Performance Assessment:

There are many objectives that organizations and companies seek to achieve through their application to the process of evaluating the institutional performance, the most important of which are:

- Assisting in verifying the ability of local units of the institution to achieve their objectives (Ivancevich, 1986). By providing a set of criteria and measures used to assess performance, the difference between what is planned and what has actually been achieved can be determined, And the weakness of the institution
- The process of achieving the objectives highlights the efficiency of the management's utilization of all the resources available to it (Al-Shahat, 1992). This is accomplished through better investment of human resources



and reducing the waste of financial resources by reducing costs and expenses, .

- Helps the manager to know what he needs to achieve high performance commensurate with its objectives, the evaluation models include a set of foundations that contribute to determine the right way to raise the efficiency of performance, which was followed to contribute to improve the level of performance at the institution.
- Contributing to the development of the local sections of the institution: through the diagnosis of the problems and problems of each department within the institution and try to address after the evaluation through the foundations and standards specific.
- Create an atmosphere of competition between all different sections within the institution by strengthening the principle of reward and punishment.

Achieving a better level of satisfaction from both customers and employees:

development must continue in order to continue to provide the best for customers and employees by providing a set of standards to measure their satisfaction with these services

### **2.2.1. Achieving goals**

Goals are important features of work organizations. To be effective, goals should be emphasized, stated clearly and communicated to all members of the organizations. Yalokwu (2006) defined organizational goal as an expectation. It is the something the organization is trying to accomplish. It is the overall purpose of an organization. Mullins (1997) observed that, the goals of an organization will determine the nature of its inputs and outputs, the series of activities through which the output are achieved and the interactions with its external environment. The extent to which an organization is successful in attaining its goals is a basis for the evaluation of organizational performance and effectiveness. Strategic change

implementation becomes pertinent if set performance standards are not met and deviations are noticed.

The goals of an organization are the reason for its existence and its activities are directed to the achievement of these goals. Yalokwu (2006) and Mullins (1994) identified the following as the usefulness and importance of goals of organizations.

These are:

- provide a standard of performance. They focus attention on the activities of the organization and the direction of the efforts of its members.
- serve as guidelines for decision making and justification for action taken. They reduce uncertainty in decision making and give the ground for defence against possible criticism.
- provide a basis for planning and management control related to the activities of the organization.
- also influence the structure of the organization and help determine the nature of technology employed. The manner in which the organization is structured will affect what it will attempt to achieve.
- help mobilize commitment of individuals and groups for the activities of the organization. They focus attention on purposeful behaviour and provide a basis for motivation and reward system.
- give an indication of what the organization is really like, its true nature and characters both for members and for people outside the organization.
- serve as a basis for the evaluation of change and organization development.
- are the basis for the objectives and policies of the organization.

( Sev. Joseph, 2014) mentioned that In organization, goals can be classified as formal and informal goals, order goals, economic goals, cultural goals, production goals, inventory goals, sales goals, market share goals, profit goals, consumers

goals, product goals, operations goals, secondary goals, satisfaction of interest amongst others.

### **Quality performance**

Best way of understanding quality performance is to understand what the concept "quality" means is, the concept quality is best define by quality gurus which will form the fundamental form determine quality performance. Deming define philosophy of quality started and ended with the customer he view quality as "satisfying customer" this means that quality is lie in the ability of organization to manage and control process properly, thus performance is determine by organization to reduce processes variation thus satisfy customer.

Crosby in other hand define quality as "conformance to requirement" so product or service requirements need to be identify, understood, and translated into specification, thus the performance is determined by the ability of product or service to conform to preset specification.

Taguchi viewed quality as "loss imported to society from time a product is shipped" this loss include failure to reach ideal performance, failure to satisfy customer, breakdown, and product side effect so performance is the ability of the processes or products to overcomes these loss and meet the performance characteristics. In manufacture quality is a degree to which product is function in accordance to specification. In service quality is determine by total experience right from time the first contact through to after sales service. So quality performance is degree to which product or service fulfills specific requirements or specifications and process capability (draw p59) However Thomes Gruberg (2007,41) describes the performance characteristic as:

- Speed: describes how quick delivery can be performed.

- Quality: describes how customers perceptions about products/services and technical as well as defects.
- Cost: price to customers and internal production cost are described via the performance characteristic of cost.
- Dependability: describes the stability in the process to deal with delivering goods and service at right time.
- Flexibility: deals with how the company reacts to changed demands and requirement of both customer and line business.

In other hand David Hoyle (2007, p.18-19) indicated that quality is composite of three parameters which is summarized below:

- Design: is the extent to which the design reflects or service that satisfies customer needs and expectations and regulatory requirement. All the necessary characteristic should the design into product or service at outset.
- Conformance: is the extent to which product or service conforms to the design standard. The design has to be faithfully reproduced in the product or service.
- Uses: is the extent to which the user is able to secure continuity of use from the product or service.

He further indicated that, In addition to quality parameter there are three dimensions of quality which extent the perceptions outlined below:

- The business quality dimension: this is the extent to which business serves the need of all stakeholders and is the out word facing view of organization.

- The product quality dimension: this is the extent to which the products and services provided meet the regulatory requirements and need of specific customer.
- The organization quality dimension:
- This is the extent to which organization maximizes its efficiency and effectiveness and is inward facing of the organization.

Efficiency is linked with productivity which itself is linked with motivation of personal and capability or processes and utilization of resources. Effectiveness is linked with utilization of knowledge focusing on the right thing to do.

Quality management system is customer oriented, thus system performance is matter of customer perceptions, how the customer react to organization products and services/ or, the degree of customer satisfaction, to large extent determine the organization level of performance.

These performance characteristics have two dimensions, internal and external. The internal dimension reflects the organization aspects such as throughput and technical quality, the external dimension focus on customer aspects such as price and delivery time.

### **OHSAS performance measurement:**

the ultimate goal of OSHMS is to reduce work related accident and illness to acceptable level, trace the progress on OSH, organization need to measure its OSH performance, so organization OSH performance is best describe by the degree to which organization succeed to reduce the workplace related accident and illness, and degree to which organizations control of its occupational health and safety risks. Its measurable results of OSHMS

This requires use of number of indicators or parameters, these measures fall into the following categories:

- Leading indicators measures: indicators that precursors to serious employee accident, injuries, and illness( unsafe act, degradation of equipment, inspection,)
- Lagging indicators measure: historical data such as lost time rate, injury rate.
- Behavioral indicators measure: the managerial and organizational culture, management commitment (OSH training implemented).

In other hand Jovasevic and Stojanovic (2009, p5-8) indicated that the concept of OSHMS evaluation can be defined by three types of indicators:

- Management performance indicators (MPI).
- Provide information about management efforts to improve the organization safety performance, such as legal requirement compliance, resource allocation, and cost of safety management ...
- Operation performance indicators (OPI)
- Provide information about safety performance about organization technical operation.
- Safety status indicators (SSI)
- Provide information about accident, incident, and near misses as well as about their consequences, such as number of death

However, measuring OSH performance (OSH performance relates to the progress against a given OSH task measured pre defined goal or objectives) is complex

due to a number of factors as expressed by HelleTonsine and Nils Wedege (2009,P2) It's difficult to define what to measure.

- Potential cost of the measurement process.
- It's not easy to acquire or access appropriate data.
- There is a time lag between intervention and results.

However OSH performance has direct link with organization culture which is subtle mix of formal and informal rules, relationships, values, customs, etc which has taken together, describe the distinctive feel of the organization"(). In the same way we can define health and safety culture as shared attitudes, values, beliefs, and behaviors relating to health and safety. It determines the management commitment to OSH and the style of health and safety management, it indicated the way that everyone within the organization thinks and feels about health and safety and how this translated into their behaviors.

Measuring OSH performance will provide information that help in developing OSH management system, which in turn reflected on risk control by, providing information on how the system operate in practice, identify area where remedial action is required, provide basis for continues improvement, and provide feedback.

It's clear that's there is needs to coherent system or framework to measure OSH performance that is aligned within overall organizations performance measurement framework.

Considering OSH as a system and according to British health and safety executive (2001,p10) OSH performance should be based on balanced approach which combines:

- Inputs: monitoring the scale, nature and distribution of hazards created by organization activities – measure of the hazard burden.
- Process: active monitoring of the adequacy, development, implementation and deployment of OSHMS and activities to promote positive safety and health culture- measure of the success.
- Outcomes: reactive monitoring of the adverse outcomes resulting in injuries, ill health, loss and accidents with the potential to cause injuries, ill health or loss- measure of failure.

### **Environmental performance:**

The aim of environmental management system is to help organization to reduce its significant impact of its environmental aspects of its operation, achieve its strategic objectives and targets and hence increase operation and system performance, achieve its environmental goals and objectives, monitoring and measuring progress towards achieving its environmental goals and objectives, compliance with national environmental legal requirement and international environmental standards and discover nonconformity and correct it in systematic and timely manner, so measuring organization environmental performance is matter of compliance with applicable legal and other applicable requirement to which organization subscribe, the performance evaluation is based on evidence required for compliance and evaluation of the degree of compliance to preset environmental objectives and targets from their environment impact assessment(EIA), this may include waste reduction, pollution prevention, emission control, conservation, and hazardous toxic substance. However ISO14001 does not state specific level of organization environmental performance, nor it gives formula for evaluating environmental performance, performance evaluation



depend on organizations environmental performance indicators which are most commonly used at organization level are compliance oriented, focusing on airborne emission, resources conservation, waste reduction, and reduce adverse environmental impact.

Integrating quality, occupational safety and health and environment management systems required each performance component is linked to each other component and aligned with each other to formulate total system performance.

The components of the system are:

- A strategic plan which sets long term direction.
- A strategy focused organizational structure designed to ensure execution of the strategic plan.
- A strategic budget which allocates resources to strategic priorities.
- A strategy management system that ensures goals are managed in a systemic and integrated manner.

This component is critical because it is highly likely that goals cut across departmental lines and cannot be managed effectively is simply assigned to an individual department.

According to Herbert A. Marlowe et al (2010, p.10) It's important to consider the following when dealing with organization performance

- A process management system that ensures both the strategic and operational work of the organizational are conducted consistent with organizational value;
- Business plans that detail specific implementation plans with timelines, resource requirements and accountability points;
- Line of sight statements which assist work units or individuals to understand their contribution to the strategic direction;

- Behavioral guides which describe in behavioral terms the product or service delivery expectations and how the organizational values look in practice;
- Align performance measures with goals and objectives.
- Link the performance measurement system to important policy processes and to other management systems.
- Present performance measures in context.

It's clear that performance measurement and management is interesting subjects to both academics and managers all over the world, question about nature of organization performance, the scope and the extent to which performance should be measured will continued to be asked in both public and private sectors. The critical factor in measuring performance is to develop statically focus business perspective and then identifies performance objectives and measure for each perspective.

One of the basic element in measuring organization is to measure organization culture, which main parameter in determine organization performance, traditionally organization culture is measure through application of qualitative method such as observation and interview. Cooper (2000, p) indicated that three main dimension (psychological, situational and behavioral) can be measure through combination of qualitative and quantitative. The situational aspect of quality, safety and environment, can be seen in the structure of organization, policies, working procedures, management system...etc. the behavioral aspect can be measure through peer observation, self reporting and outcome measure. The psychological dimension is most commonly examined by organization climate questionnaire devised to measure people perception.

However there are some common criticism of performance measure include unclear purpose, vagueness, lack of connection( or even opposition, for that matter) to the business strategy, un fairness or inconsistency, and their liability to be used chiefly for punishing people.

The challenge for this thesis is to find, reliable, comparable, and constant indicators that measure the dimension of the IMS without common drawback attributed to performance measurement.

Integrated management system contain specific requirements that if applied correctly would allow organization to satisfy its various stakeholders, this depend on organization ability to interpreted and apply the requirements of each standard and the degree of management commitment. These require full understanding of TQM which is fundamental basis of system thinking.

### **2.2.2. Employees' satisfaction:**

Employee satisfaction has been a key area of research among industrial and organizational psychologists (Anna Salanova, 2010). According to Nancy C. Morse (1997) "Satisfaction refers to the level of fulfillment of one's needs, wants and desire. Satisfaction depends basically upon what an individual wants from the world, and what he gets." Employee satisfaction is a measure of how happy workers are with their job and working environment. It is sure that there may be many factors affecting the organizational effectiveness and one of them is the employee satisfaction. Effective organizations should have a culture that encourages the employee satisfaction, Bhatti & Qureshi, (2007) Employees are more loyal and productive when they are satisfied Hunter & Tietyen, (1997), and these satisfied employees affect the customer satisfaction and organizational productivity, Potterfield, (1999). There is no limit for the employees to reach the

full satisfaction and it may vary from employee to employee. Sometimes they need to change their behaviors in order to execute their duties more effectively to gain greater job satisfaction, Miller, (2006). Having good relationships with the colleagues, high salary, good working conditions, training and education opportunities, career developments or any other benefits may be related with the increasing of employee satisfaction “Employee satisfaction is the terminology used to describe whether employees are happy, contented and fulfilling their desires and needs at work. Many measures support that employee satisfaction is a factor in employee motivation, employee goal achievement and positive employee morale in the work place.” Susan M. Heath field (About.Com). Cranny, Smith & stone (1992) defined ES as the combination of affective reactions to the differential perceptions of what he/she wants to receive compared with he/she actually receives. According to Moyes, Shao & Newsome (2008) the employee satisfaction may be described as how pleased an employee is with his or her position of employment. As Spector (1997) defined job satisfaction as all the feelings that a given individual has about his/her job and its various aspects. Employee satisfaction is a comprehensive term that comprises job satisfaction of employees and their satisfaction overall with companies’ policies, company environment etc.

Value is created by satisfied, loyal and productive employees. Employees who feel a sense of teamwork and common purpose, a strong commitment to communication, and managerial empowerment are most able, and willing, to deliver the results that customers expect (Employee Satisfaction”, 2005) Human Relations perspective posits that satisfied workers are productive workers (e.g., Likert, 1961; McGregor, 1960). Thus, organizational productivity and efficiency is achieved through employee satisfaction and attention to employees’ physical as well as socio emotional needs. Human relations researchers further argue that employee satisfaction sentiments are best achieved through maintaining a positive

social organizational environment, such as by providing autonomy, participation, and mutual trust (Likert, 1961). Employees’ job satisfaction sentiments are important because they can determine collaborative effort. Consistent with this reasoning, Likert (1961) has argued that collaborative effort directed towards the organization’s goals is necessary for achievement of organizational objectives, with unhappy employees failing to participate (effectively) in such efforts. In a unique study conducted by Harter et al. (2002), based on 7,939 business units in 36 organizations, the researchers found positive and substantive correlations between employee satisfaction-engagement and the business unit outcomes of productivity, profit, employee turnover, employee accidents, and customer satisfaction. The predominant view has focused on the situational context (e.g., supervisory support) as a cause of satisfaction and has argued that high-performance work practices and thus a positive working climate foster employee satisfaction (see, e.g., Bowen, & Ostroff, 2004; Wright, Dunford, & Snell, 2001; Wright, Gardner, Moynihan, & Allen, 2005).

Keen observation of employee reactions and conduct is by far the most obvious and easiest technique. Casually walk around the office, watching employees working, interacting with each other and talk to them informally. Are they smiling, energized, cooperative and alert or listless, inactive and unhelpful? You can even employ a professional consultant as an objective third-party to assess the work atmosphere and compare with other companies.

Table (2.5) Employees’ satisfaction definition

Alam Sageer.et.al,2012	Terminology used to describe whether employees are happy, contented and fulfilling their desires and needs at work
	Happy workers are with their job and working environment,
Nancy C. Morse (1997)	Refers to the level of fulfillment of one’s needs, wants and desire

### 2.2.3. Customer's satisfaction:

According to (Alexandra Simon, 2012) to achieve customer satisfaction, firms need to create an environment and culture to find ways to serve customer needs and expectations. For these reason, management system standards (MSSs) that aim at satisfying customer needs, are becoming more and more popular Customer satisfaction definition define-Customer satisfaction is as

Table (2.6) Customer's satisfaction definition

Westbrook & Reilly,1983	Emotional response to the experience provided by, (or associated with particular products or services purchased, retail outlets, or even molar patterns of behavior, as well as the overall marketplace
Hunt ,1977	process of evaluation rendered that the experience was at least as good as it was supposed to be
Oliver, 1977	Is the customer's fulfillment response, a judgmental that a product or service feature, or the product or service itself, provides a pleasurable level of consumption-related fulfillment.
	The number of customers or percentage of total customers, whose reported experience with a firm, its products, or its services (ratings) exceeds specified <u>satisfaction</u> goals, and it is a measure of how products and services supplied by a company meet or surpass <u>customer</u> expectation.
Tse & Wilton (1988)	Process of consumer's response to the evaluation of the perceived discrepancy between prior expectations and the actual performance of the product as perceived after its consumption
Juran (1991)	Is the result achieved when service or product features respond to customer needs and when the company meets or exceeds

	customers' expectations over the lifetime of a product or service.
Nemati et al., 2010).	A business terminology to evaluate how much a product or service supplied by company has been able to satisfy or please the customer.

Customer satisfaction has become a vital concern for companies and organizations in their efforts to improve product and service quality, and maintain customer loyalty within a highly competitive market place. Because we find that only marketing innovation relates to customer satisfaction, managers should adopt innovative marketing strategies to enhance customer satisfaction, especially with regard to optimizing perceived product and service quality to meet and exceed customers' expectations. Although the findings provide meaningful implications for organizations implementing IMS or IMS integration, In modern business philosophy business should be customer oriented and the implementation of the main principles of continuous improvement, justifies the importance of evaluating and analyzing customer satisfaction. In short, customer satisfaction is considered as baseline of standardize and excellence of performance for many business. It also helps to identify the potential market opportunities. (Evangelos and Yannis 2010, 1- Mentioning about importance of customer satisfaction in business perspective Zairi (2000) said in one magazine 'Customers are the purpose of what we do and rather than them depending on us, we very much depend on them. The customer is not the source of a problem, we shouldn't perhaps make a wish that customers 'should go away' because our future and our security will be put in jeopardy.' However, the concept of customer satisfaction is not a new one. It hit the business sectors in early 1980's where some researchers considered that customer satisfaction is the best window into loyalty. They also found that it has direct relationship with company profitability, ROI (return on investment), or share of market. Satisfied customer think twice or several times before switching to

alternatives because they become attached emotionally and also afraid to believe on alternatives quality. Oliver (1997) Zairi (2000) mention more about the importance as-‘numerous studies that have looked at the impact of customer satisfaction repeat purchase, loyalty and retention. They all bring the similar message. First, satisfied customers share their experience with average five or six people and dissatisfied customers normally tell ten people about their unfortunate experience. Secondly, many customers do not complain about dissatisfaction but it is needs to realize by the company and it differs from industry to industry. Finally, people do not think dealing customer satisfaction is not as costly as to recruit a new customer. Actually it is only twenty five percent of the recruit a new customer, (Wadud Sharmin, 2012.)

## **IMS and Business Results**

The previous section introduced the existing relationships found in the literature between MSSs and innovation. Standardization of IMS helps to create an environment and culture that supports achieving business results, one of the core components of management standards is achieving goals and customer satisfaction. Companies that implement IMS have to explore and find ways to serve customer needs and expectations at the best. This creates the impetus for companies to be efficient in achieving excellent results. The relationship between IMS and customer satisfaction is supported by the fact that the most implemented standards worldwide, ISO 9001 and ISO 14001 are focused on customer satisfaction. QMS (ISO 9001, 2008) requires that customer satisfaction is monitored. Companies that are ISO 9001 certified demonstrate to their customers that they comply with the ISO’s QMS requirements therefore, organizations have to measure customer satisfaction, determining the needs and expectations of their customers and showing that their product or service meets Customer needs and expectations (ISO 9001:2008). Implementation of ISO 14001 by setting up of internal processes gives



confidence to customers about the managing of environmental issues. Therefore, one of the key elements of IMS is the need for a customer focus. Moreover, in a competitive environment, product and service innovation is necessary to surpass competitors in the degree to which the needs of customers are satisfied.

**2.3.1. Human Capital Efficiency:**

Human Capital Efficiency is the resources and/or strategic advantages of a business, including the combination of pooled knowledge and technical capacities that allow it to be competitive in the marketplace. They are what the company does best and consist of the combined activities, operations, and resources that distinguish the company from competitors. Practical intelligence of knowledge-based situations and their transformation into the same the growing plurality of cases " the third is the ability to equip shareholders' networks around the same positions to evaluate the bets and to ensure appropriate areas):

Table (2.7) Human Capital Efficiency

P.ZARIFFIAN, 2001	Take the initiative and responsibility to face professional situations
Charles Hall,2008	Optimal utilization of available resources measured by the amount of inputs used to produce specific units of output
Nseer Gasim,2016	Skill of management activities superior results through the efficient use of human resources and systems to reach the applications of global standards
(Agbada.2013)	Are a set of knowledge, skills, behaviors and attitudes that are used to improve performance and help employees to perform work efficiently

### **2.3.1. Development of Human Capital Efficiency:**

Resources, such as human resources, physical assets, patents, brand equity, and capital, can be or can contribute to a company's core competencies. An organization's capabilities can also be or contribute to core competencies, and they consist of how a firm uses its resources to be competitive and operate efficiently. Once an organization identifies its core competencies, internal investment should be directed towards maintaining these areas and ensuring they remain unique within the industry sector. Sometimes, when particular functional areas or activities are outside of the core competencies of the business, outsourcing is considered. Outsourcing is essentially a transfer of business to a company which core competencies include the transferred activities and functions.

Among the internal resources which can be considered sources of competitive advantage is the human element, mainly due to its intangible characteristics: knowledge, skills and attitudes (Wright et al., 1994; Kamoche, 1996; Mueller, 1996; Barney and Wright, 1998) and organizational knowledge (Bassi et al., 1998; Lee and Yang, 2000; Alavi and Leidner, 2001; Bollinger and Smith, 2001) are being given more and more significance. Although all practices of personnel management are implied in the development of these resources, training is the main activity in order to have qualified, flexible and well-prepared employees (Bartel, 1994; Raghuram, 1994; MacDuffie and Kochan, 1995) and to achieve the correct running of each stage of the process of knowledge management

### **2.14 Summary of the Chapter**

A structured literature review of the study construct in general was undertaken in this chapter to define and conceptualize. The preliminary part displays the foundation and conceptualization of Integrated Management System in the term of

quality, environmental and management systems, the chapter illustrates the conceptualization of business Results constructs (through achieving goals and customer satisfaction). The chapter illustrates the relationship between constructs of the current study. In the final part, the chapter illustrates the mediating role of human capital efficiently between Integrated Management System and business results. The next chapter will focus on theory, conceptual framework and hypotheses development.

## **Chapter 3:**

### **Theoretical Framework and Hypothesis Development**

#### **3.0 Introduction**

This chapter presents the research framework and the hypotheses development, methodology, the sampling procedures, the measurements of variables, the development of research instrument, the administration of data collection, and the statistical techniques that used to test the hypotheses.

#### **3.1 Conceptual Framework**

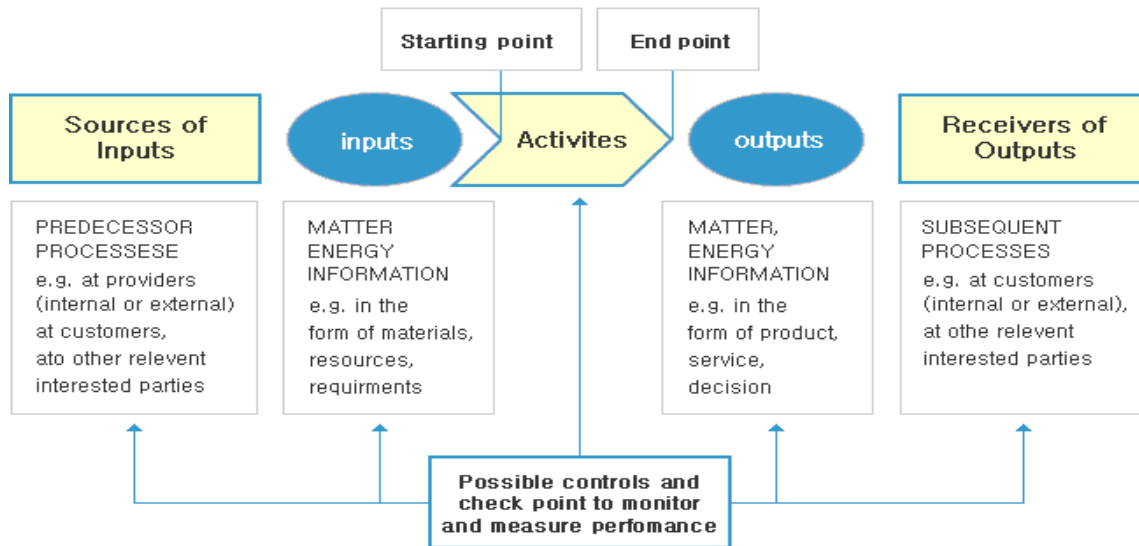
##### **3.1.0. Theoretical Background**

According to (Abdel Salam, 2017) the theory is a “statement of relationships between units observed or approximated in the empirical world The primary goal for a theory is to answer “how”, “when” and “why” questions. The theory expression can be contrasted to a description, which primarily aims at answering “what” questions, theory is the building blocks of hypotheses then hypotheses and their tests are the foundation of understanding (Schmenner et al., 2009 p. 339). So the theory of general systems consists of a set of philosophical concepts that can be applied in any fields, which means "Interaction and overlap of parts seen as a whole." System theory has been defined as "Each of the parts assembled and linked to form a complex omnipotence unit."

##### **3.1.1 Systems Theory:**

Based on previous studies General Systems Theory, the model of the study was based on the theory of systems that emerged in the 1960s as a result of the writings that followed by Ludwig von Berenflei, 1937) presentation and the ideas of (Chester Bernard 1937) General Systems Theory Business organizations shouldnot be viewed from a partial perspective. The nature of administrative work requires

multiple aspects, internal administrative and organizational components, and external interactions with the environment in which they live and the continuity of their survival. Therefore, the systems approach is an administrative approach that provides the director with a comprehensive framework for analysis And Thinking to solve various administrative problems and make effective decisions. The system (Algarioty, 2008) is an organized and complex configuration of elements and parts that are interrelated and integrated in a coherent configuration to achieve specific objectives. It is also defined as a set of sub-systems that are interrelated and arranged in a form that is an integral entity whose features and general characteristics differ from those of the sub- Each part depends on the other in an integrated way to achieve the objectives of the overall system, each seeks to achieve the overall goal of the organization through its activities and objectives of the self, and defines the system also as a set of objectives are components or parts or subsystems are linked with each other regular relationships can be Thus, systems theory looks at the institution as a series of actions that seek to develop mechanisms designed to achieve effective performance.



Source: The ISO Technical Committee 176 has published a paper ///The PROCESS APPROACH in ISO 9001:2015 (ISO/TC 176/SC 2/N1289) and a detailed presentation on ///the PROCESS APPROACH in ISO 9001:2015

Figure (3.1) Schematic representations of the elements of single process

management systems is made up of a network of value-adding processes, according to (ISO/TC 176/SC 2/N 630R), like Customer Oriented Processes, Support Oriented Processes, Management Oriented Processes, Quality Managed Processes, and Outsourced Processes that link, combine and interact with one another to collectively provide product or service. These processes are inter-dependent and can be defined by complex interactions. In order to plan and implement QMS using the ‘Process Approach’, depend on:

- Identifying the processes needed for the management systems.
- Determine their sequence and interaction with high level flowchart or a process map.
- Determine the application of management systems processes throughout the organization a popular way is through graphical representation, process maps.

- Determine (plan) the criteria, methods, information, controls and resources needed for each management systems process.
- Identify the internal/external customer-required output.
- Describe the process activity that produces the output.
- Identify the resources needed for the process activity.
- Identify the inputs for the process – information, materials, and supplies.
- Performance indicators for process output must focus on meeting customer and regulatory requirements.
- Performance indicators for process activity should focus on measuring process effectiveness and efficiency.

### **Resource Based View (RBV)**

According to (RBV) view, companies can gain competitive advantage if they able to achieve superior resources and capabilities and these are valuable, rare, inimitable and non- substitutable. Thus the objective is to identify, develop and deploying key resources to maximize returns, the relational view finds the source of competitive advantage in the collaboration between firms and more specific, it identifies four sources of inter-organizational competitive advantage: relation specific assets, knowledge sharing routines, complementary resources / abilities and effective governance (Dyer and Hatch, 2006). As organizations face continuous uncertainty, ambiguity and strategic discontinuities. The resources are the sum of the material and non-material assets associated with their activities

during a specific period (Laroche, H., et Nioche, 1998). Based on the above definitions, resources can be divided into two types:

- Material resources: such as (production equipment, buildings, human capital)
- Non-material resources: invisible resources, which are difficult to collect such as:
  - Quality: It refers to the ability of a product or service to meet customer needs and expectations.
  - Technology: Means the development and control of technology.
  - Information: One of the strategic resources of an organization and the basis for most decisions.
  - Knowledge: includes the technical and scientific information.
  - Skills: Resources, including knowledge, become capacities when they are coherent, interdependent and interrelated.

The accumulation of these capacities results in the organization's income, which is divided into two categories: individual skills and collective skills.

- Individual skills: The characteristics of each individual in the organization are different in terms of jobs, and there are fundamental characteristics of knowledge and qualifications that guarantee effectiveness in work. They acquire teaching, development, and differential skills. These are self-awareness, motivation, and characteristics of the poor that distinguish between high performers and average performance. (gestion des competences, 1996).
- Collective skills: those skills and knowledge resulting from synergy and overlap between a range of activities of the Organization through the friction



between its creators and allows to create new resources for the Organization through development and innovation through interactive knowledge among them. Resources of intangible play an important role in the competitive institutions and excellence, these resources cannot be copied or imitated, which is the result of years of experience and learning institution. It is necessary to identify the characteristics of the resources that established the competitive advantage.

The model which based on the RBV theory that emerged in the mid-1980s due to Wernerfelt (1984), Barney (1986-1991) and (Rumel, 1984). The theory attempted to explain the importance of resources, Intangible or unforeseen and its increasing role in achieving superior results, and it considers all the resources of the institution affect the capabilities of the institution and thus affect the performance, and focuses on the internal aspects of the institution, and the disparity in the levels of administrative performance of the differences between them where resources and possibilities available (Hunt & Morgan , 1996), are considered as food management systems An important and important internal resource that gives the organization a competitive advantage that helps to continue to achieve superior results.

### **Figure 3.2 study conceptual framework**

Framework of the study: It is a mental plan or imagination of the relations between the concepts that describe the logical relationship between the variables, independent and follower and mediator (Uma Sikaran). The model of the study is based on the previous studies and the research gaps, in addition to the theories described above.

**IV: Integrated Management System (IMS)**

**DV: Business results**

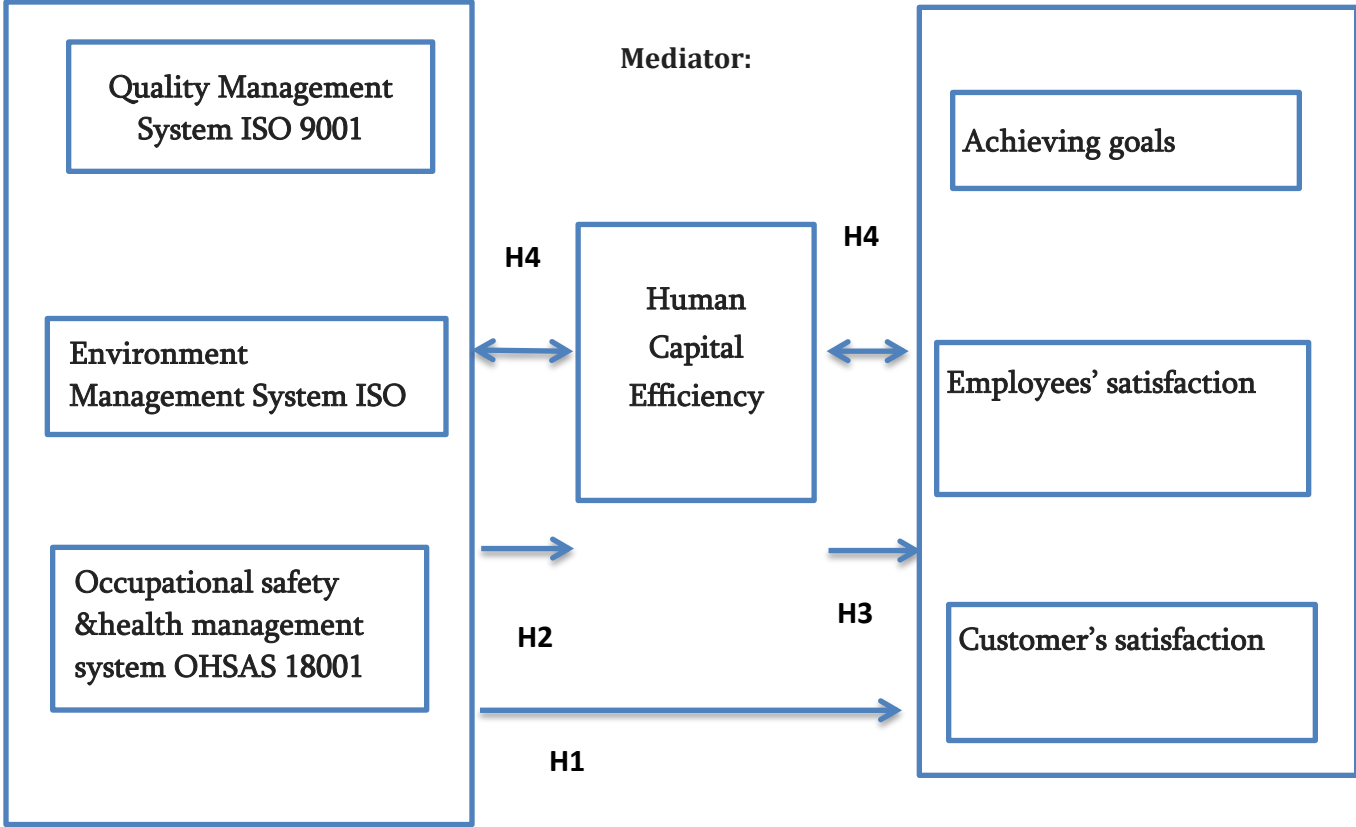


Figure (3.2) study conceptual framework

**3.2 Development of Hypotheses:** depend on the research framework and previous studies, the hypotheses were developed and the significant relationship between the following variables was developed as:

**3.2.1 Relationship between Integrated Management System (IMS) and business results:**

Mohamed Youssef, 2017, reported a positive relationship between the application of the Integrated Management System and the performance of the institutions and showed that the integration of ISO specifications has a positive impact on sustainable development, "The system has a positive impact on improving environmental performance". Bernardo said in a statement. "The implementation

of the system in stages reduces the obstacles facing the system, Business Organizations, Fayeze (2018) study, explained that the integration of the requirements of ISO 9001 and Guideline of ISO 9004 positively affects the level of performance, study of Male (Yang, 2018) on the positive impact of MIS (2005). The impact of the Integrated Management System (IMIS) on the optimal use of resources, the reduction of cost and the improvement of the communication process, and the study of the impact of the Integrated Management System (IMIS) on the sustainability of green management systems (IMS) Mounir, 2011) examined the alignment between quality and environment and its impact on promoting competition, continuous improvement and achievement of objectives.

The first hypothesis was formulated as

**H1. There is a positive relationship between implementation of Integrated Management System and business results.**

H1.1. Integrated Management System (IMS) has a positive effect on Business results (Achieving goals), developed sub hypotheses as follow:

H1.1a: There is positive relationship between QMS and Achieving goals.

H1.1b: There is positive relationship between EMS and Achieving goals.

H1.1c There is positive relationship between OHS and Achieving goals.

H1.2. Integrated Management System (IMS) has a positive effect on Business results (Customer's satisfaction), developed sub hypotheses from as follow:

H1.2a: There is positive relationship between QMS and customer' satisfaction.

H1.2b: There is positive relationship between EMS and customer' satisfaction.

H1.2c: There is positive relationship between OHS and customer' satisfaction.

H1.3. Integrated Management System (IMS) have not positive relationship with Employees' satisfaction

H1.3a: There is positive relationship between QMS and Employees' satisfaction

H1.3b. : There is positive relationship between EMS and Employees' satisfaction

H1.3c: There is positive relationship between OHS and Employees' satisfaction.

### **3.2.2 Relationship between Integrated Management System (IMS) and Human Capital Efficiency:**

The study examined the relationship between the adoption of the environmental management system ISO 14001 and the efficiency of the human resource, and the study of (Saffar, 2008), which created a positive effect between Regular quality management and environmental assessment in accordance with the requirements of ISO 9001 and ISO14001 and increase the efficiency and experience of human resources. The second hypothesis has been formulated.

H.2. There is a relationship between the Integrated Management System (IMS) and human capital efficiency, it has been derived following sub-hypotheses:

H2.1:There is positive relationship between QMS and increasing the of human capital efficiency.

H2.2:There is positive relationship between EMS and increasing the of human capital efficiency.

H2.3:There is positive relationship between OHS and increasing the of human capital efficiency.

### **3.2.3. Relationship between human capital efficiency and business results:**

The results of the study (Jawad, 2016) showed that there is a relationship between the intrinsic dimensions of their dimensions (efficiency, organizational resources, strategic leadership) and organizational superiority by dimension (strategic planning, information, analysis, Positive Impact of Core Competencies and

Performance Results by Developing New Products and Exceeding Competitors' Performance (Boizid, 2012) Resources and competencies as an input to superior performance and competitive advantage Hypothesis 3 There is:

H.3. There is a positive relationship between human capital efficiency and business results Fall into the following sub-hypotheses:

H.3.1. There is a positive relationship between human capital efficiency and achieving goals.

H.3.2. There is a positive relationship between human capital efficiency and customer' satisfaction.

H.3.3. There is a positive relationship between human capital efficiency and employees' satisfaction.

#### **3.2.4. The mediating role of human capital efficiency between Integrated Management System (IMS) and business results:**

The study (Iman, 2014) explained the relationship between the management of safety, health and environment and improving performance, study (2012, Bakhtah) aimed at clarifying the positive relationship between the system of occupational safety and health and improve performance and increase the efficiency of workers. And the study (Saffar, 2008), which dealt with the role of competencies and expertise in evaluating the performance of the quality management system and the environment on which the fourth hypothesis was formulated:

#### **H.4 mediating role of human capital efficiency between the implementation Integrated Management System (IMS) and business results**

##### **H.4.1. Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results (Achieving goals)**

H.4.1a: Human Capital Efficiency mediates relationship between QMS and Achieving goals.

H.4.1b: Human Capital Efficiency mediates relationship between EMS and Achieving goals.

H.4.1c: Human Capital Efficiency mediates between OHS and Achieving goals.

**H.4.2. Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results (customer' satisfaction)**

H.4.2a: Human Capital Efficiency mediates relationship between QMS and customer' satisfaction.

H.4.2b: Human Capital Efficiency mediates relationship between EMS and customer' satisfaction

H.4.2c: Human Capital Efficiency mediates between OHS and customer' satisfaction

**H.4.3. Human Capital Efficiency mediates the relationships between Integrated Management System and the Business results (Employees' satisfaction)**

H.4.3a: Human Capital Efficiency mediates relationship between QMS and Employees' satisfaction.

H.4.3b: Human Capital Efficiency mediates relationship between EMS and Employees' satisfaction.

H.4.3c: Human Capital Efficiency mediates between OHS and Employees' satisfaction

**Control variables:**

Gender - Age - Academic qualification - Job - Practical experience

**3.3. Research Methodology:**

Research methodology, Population and sample of the study, designing questionnaire, pretest and variables measurement and Data Analysis Techniques.

**3.3.1. Research Design**

A research design is the specification of methods and procedures for acquiring information needed to structure or solve problems. It is the overall operational pattern or framework of the project that provide what information is to be collected, from which sources, and by what procedures. A research design might be described as a series of advance decisions that, taken together, form a specific master plan or model for the conduct of the investigation (Green, Tull and Albaum, 1988, p. 97).

**3.3.1.1 Research Philosophy**

Philosophy is a driving orientation of research, based on positive philosophy, through what has been confirmed from previous studies based on the development and testing of hypotheses and theory.

**3.3.1.2 The Research Methodology**

It is important to determine the most appropriate method for this study, as well as to determine the function of the philosophical approach before choosing this methodology. According to (Tsai and Chou, 2008) there are three points to be considered: the first, the methodology can assist in making the research design clear. The research design includes where and how to collect the evidence data for

providing good interpreted to answer the research questions. Secondly, knowledge of the philosophy lets the researcher know how to avoid mistakes and points up the limitations for their research. The third one is that the knowledge of philosophy can create the dissimilar subject or knowledge structures from the research design from researchers past experiences. That is to say the research method is significant in linking theory and data in the research. (Creswell, 2003, p.5). Generally, there are two main methodologies: quantitative and qualitative. Quantitative research focuses on statistical techniques Tsai. (2008). Qualitative research explores social constructs, such as: Human beliefs, behaviors, perceptions and values.

### **3.3.1.3 Qualitative and quantitative research:**

- **qualitative research** is a method based on small samples intend to provide insight and understanding of the problem setting which one is more focused on the analysis of data, such as words (Malhotra, 1996).

**3.3.1.4- Quantitative research** involves the collection of primary data from a large number of individuals, frequently with the intention of projecting the results to the larger population Martins et al. (1996).

## **3.4. Methodology**

Consistent with the purpose of this study to investigate the effects of Implementation of Integrated Management System (IMS) in the Electric power sector, the quantitative method was used (quantitative involves the collection of primary data from a large number of individuals, frequently with the intention of projecting the results to the larger population Black (1999) for this purpose the study have used the descriptive method.



### **3.4.1. Population:**

Population of the study consists of the number of companies representing the electricity sector in Khartoum State, which are five companies that relied on the sample method because it is not practical to investigate all elements of society (Sekaran 2010). The study dealt with the electricity sector in the state of Khartoum and included companies of:

1. Sudanese Thermal Power Generation Company
2. Sudanese Electricity Distribution Company
3. Sudanese Electricity Transmission Company
4. Marawi Dam Electricity Company
5. Sudanese Company for Water Generating.

### **3.4.2 Sample of the study:**

Sampling process involves selecting a sufficient number of the right elements that represent the population. (Sekaran and Bougie , 2010) Sampling techniques can be divided into two broad categories, that is, probability and non-probability sampling (Marsden and Wright ,2010). Probability sampling is distinguished by the fact that each population element has a known chance of being included in the sample. In contrast to non-probability sampling, the basic principle that distinguishes probability sampling from nonprobability sampling is the condition that each element in the population is given a nonzero probability of being selected into the sample (Marsden and Wright, 2010).

- Determining the appropriate sample size – factors, such as, the research objectives, the precision desired, the acceptable level of risk in determining the

level of precision, the variability of the population, the costs and the time constraints and the possible size of the population were taken into consideration when determining the sample size. (Sekaran and Bougie (2010) indicated that for generalizability the sample size and the sample design must be representative of the sample. Even if the sample size is large, inappropriate sample design does not compensate to allow generalization of the population. This is also true, unless the sample size is large and satisfactory and meets the desired precision level it cannot be a useful tool for the research.

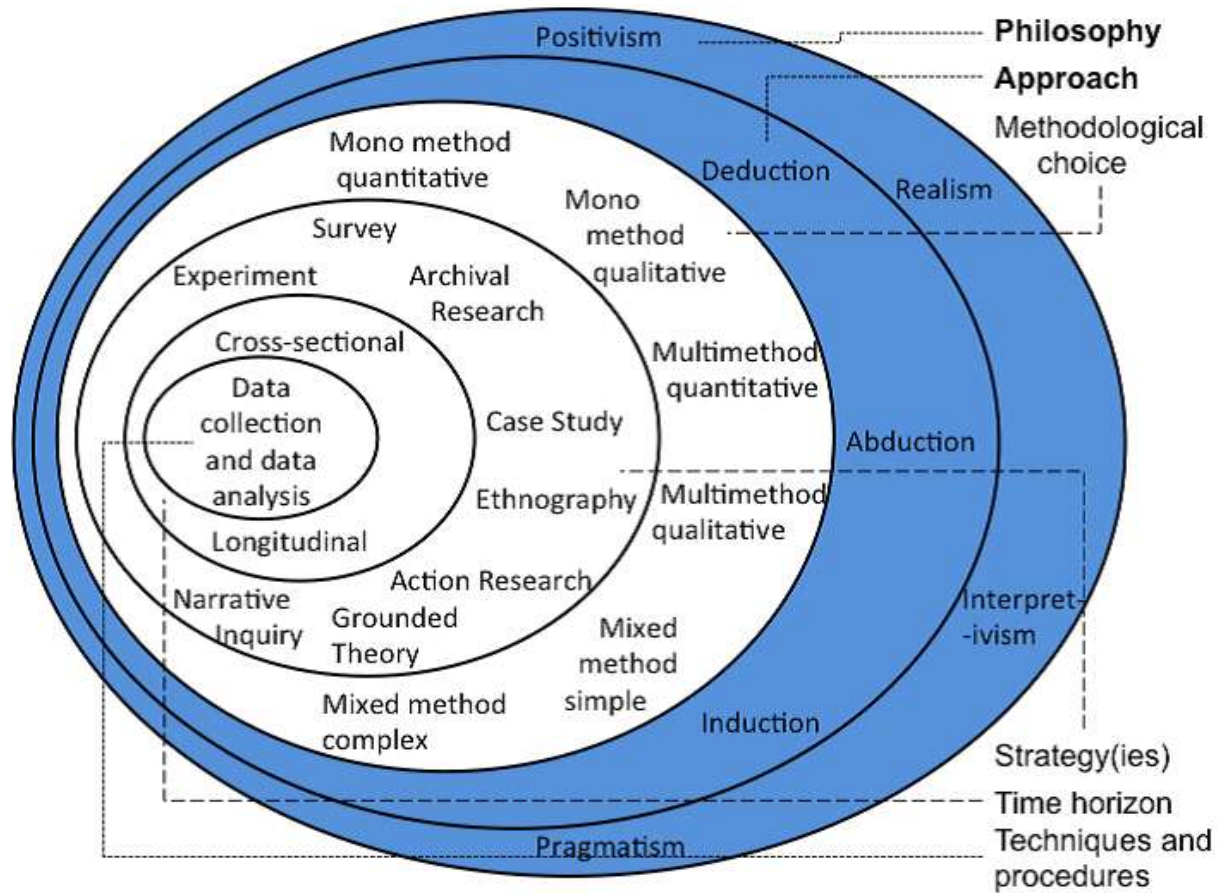
Defining the population: Researcher has chosen the Electricity sector in state of Khartoum because they are involved in implementation of Integrated Management System. administrative managers are represented in the functional names according to the structure (the general manager, the general manager, the director of the department, the department manager and the employees in the administrative development quality, environment and safety departments, by very nature they were suitable candidates for purposive sampling survey.

Determining the sample design: Researcher chose non probability sampling for this research. And according to sample size calculator.raosoft.com, the study sample consisted of (210) senior management The employees of the safety and quality departments and the environment operating in the electricity sector are represented in the functional names according to Job Description consisted of General Managers, Technical/Departmental Managers, owners of Processes, EM and HSE Officers, Project Managers.

### **3.4.3 Quantitative data collection method:**

Quantitative data collection involves gathering numerical data using structured questionnaires or observation guide to collect primary data from individuals. The collected data may be a combination of beliefs, opinions, attitudes and lifestyle to

general background information, such as, age, gender, education and position. Business researchers often refer to quantitative data collection as survey research, (Hair et al, 2007) define the survey research methods as the research procedures used for gathering huge amount of unprocessed statistics by question and answer.



Source: Saunders, N, Lewis & Thornhill, A(2012) Research Methods for Business Students, 6th Edn, Pearson

Figure (3.3) Business Research Methodology

### 3.5. Measurements of the Variables

Table (3.1) Measurements of the Variables

Items	sources	
Conformity to ISO 9001: 2008 Quality Management Systems Requirements		
1	Company determines and meets customer's requirements to fulfill them continuously.	
2	Policy is clear, approved and declared to all partners.	
3	Company is committed to providing necessary resources to achieve system requirements.	
4	System is documented (processes and Procedures) and effectiveness.	
5	Company improves processes and procedures to ensure efficient performance.	
6	Corrective actions are performed to remove nonconformities and prevent its recurrence.	
7	Preventive actions are taken to remove and prevent expected nonconformities. .>nonconformities.	
8	The analysis and measurement processes are carried out to continuously improve system efficiency.	
9	Feedback from partners used to improve processes and procedures.	
10	Performance improvement, basing on internal and external audit results.	
11	Integrated management system is implemented as a tool of continuous improvement.	
12	Top management leads the change to the best and supports excellence in performance.	
Conformity to Environmental Management System Requirements ISO 14001		
13	Policy provides a framework for developing and reviewing environmental goals.	(Muhammad, 2016)
14	Company determines environmental aspects that significantly impacts on environment.	
15	Company is fully aware of legal and regulating legislation regarding environmental aspects.	
16	Company has a plan and measures for identifying emergency and probable accidents.	
17	Company responds to situations and probable emergency and accidents.	
18	Adopted corrective and preventive actions are appropriate to size and severity of problems environmental effects.	
19	Management review inputs include position of company's	

	environmental performance.	
Conformity to Occupational Health and Safety Assessment Series OHSAS 18001		
20	Company fully aware of legal and regulatory legislation regarding occupational safety and health of employees.	
21	Company's management has a plan and procedures for identifying probable accidents and emergencies.	
22	Company's management has immediate measures for preparing and responding to emergency situations to ensure safety and health of employees.	
23	Occupational safety and health system is effective.	
24225	Employees are aware and cultured of occupational safety and health at work field.	
25	There are posters of notifications about occupational safety and health at workplaces.	
26	There is first aid kit ready for use at work area.	
27	Work environment is safe and free from hazardous exposures.	
Business Results: Achieving Goals		
28	Vision and mission are published and clear.	<b>(Hanafi, 2010),</b>
29	Vision is in line with the values of society.	
30	Application of Integrated Management System increased productivity	
31	Adoption of integrated management system contributed to development, quality assurance and continuous improvement.	
32	Procedures of environmental management system reduce using raw materials.	
33	Emissions and pollution rate decreased	
343333	Implementing system at company decreased waste of resources.	
35	Noise rate decreased	
36	Implementing system reduced industrial waste.	
37	Occupational injuries and hazardous exposures are few.	
38	Reduce wasted hours.	
Employee's Satisfaction:		
2013), as such shown in the table below.		
39	Equality and transparency the most important elements of the company.	<b>(Hanafi, 2010), (Mahmoud, 2009) and (Hatim,</b>
40	Company enhances communication between employees.	
41	Company aims at achieving satisfaction of all employees.	
42	Company provides moral support by motivating employees.	
43	Workload is commensurate with entrusted to employees tasks.	

44	Company is keen to develop employees' abilities and competences through appropriate training programs.	
45	Company aims at reducing turnover rate of employees (job stability).	
46	Company considers creating teamwork spirit and encourages work teams.	
Customer's Satisfaction shown in the table below.		
47	Company has high potential in obtaining customer's and related information.	(Zollinger , 1999). (Mahmoud, 2009)
48	Company has a clear mechanism to deal with customer complaints and deal with them professionally.	
49	Company uses information technology systems to handle customer's complaints.	
50	Product presented by company's management fulfills customers' needs.	
51	Company is keen to maintain its customers and increase their loyalty.	
52	Implementing system reduced customers' and local community's complaints.	
53	Company improved mental image of customers.	
54	Integrated Management System contributes to increase partner's satisfaction continuously.	
55	Company is committed to increase progress of its position and credibility at community.	
Human Capital Efficiency		
56	Company determines training needs and required cadres to establish system requirements.	(Rashad, 2009), Nseer Gasim, 2016 (Agbada.2013)
57	Company supports employees learning new skills that increase their performance quality.	
58	Company requires employees who perform works affecting product quality appropriate skill, experience and competence.	
59	Employees are judged to be competent according to personal qualities and ability to perform entrusted tasks.	
60	Company has competencies that are not possessed by competitors.	
61	Employees have abilities to contribute to achievement of strategic goals.	
62	Employees respond quickly to change.	
63	Company considers recruitment and maintaining of competent employees.	
64	Company encourages learning and cares talent.	
65	Company supports individual initiatives and innovation.	

Source: prepared by researcher (2019).

Discusses business results (employee satisfaction, customer satisfaction, achievement of objectives), Satisfaction of the employees: he pointed out both (Andy out of Ramapo, 1980 ) that is a satisfaction employee, indicate feelings towards work the same way they are used the term "living standard" is used to describe one's reactions and reflections on life in general as "then extent to which the organization achieves its goals" (Hanna, 1988) Set for it. It consists of 11 phrases (Mahmoud, 2009) and (Hatim, 2013), as shown in Table below:

Table (3.2) Measurements of the Variables Dimensions

Study Variables	Dimensions	Items	source
<b>Integrated Management System</b>	Conformity with the ISO quality management system requirements of ISO 9001: 2008	11	(Mounir, 2011), (Faisal, 2015)
	Conformity with the requirements of the Environment Management System 2004: ISO 14001	6	(Muhammad, 2016)
	Conformity with the Occupational Safety and Health Management System requirements 2007: OHSAS 18001	7	Bakhtah Hadar
<b>Business results</b>	Achieving goals	11	(Hanafi, 2010),
	Employee satisfaction	8	(Iyad, 2011)
	Customer satisfaction	9	(Al-Qarai, 2014),
Human Capital Efficiency	Human Capital Efficiency		(Rashad, 2009), Nseer Gasim, 2016 (Agbada.2013)

Source: prepared by researcher (2019).

### 3.6. Designing and developing questionnaire:

According to Tharenou et al., (2007 p164) a well-constructed and applied questionnaire should be able to gather data to enable the measurement of the

relationship between variables . In the self-administrated way the questionnaire is to be completed by the perspective respondent intervene from the interviewer. Usually in the cases the interviewer-administrated is regarded as one of most common techniques usually is used in all types of business studies (mayor and Blackmon.2005). This method enable researchers to get more freedom and flexibility to collect more data and information ( Bryman and Bell, 2007). Although, this method consumes time and cost an effort but it ensure the accuracy truth .The measurement questions (items), which were essential for the study, were based on a five point Likert-Scale: ((1) Strongly Agree, (2) Agree, (3) Neutral, (4) Disagree, (5) Strongly Disagree

### **3.6.1 Formatting questionnaire:**

This step involve the conversion of the research objectives into information required to obtain the necessary result, it involves formatting the clearly statements. All the research questions in this study had been converted into the relevant questions and clearly stated. Most of the respondents were familiar with Arabic language. Therefore, the instrument required translation to Arabic language and then to English language again. The study questionnaires distributed to employees. The English version was first developed and then translated into Arabic, and then back-translated into English. Some final refinement of the questionnaire was made based on their feedback.

### **3.6.2 Question warding**

This step examines whether the questions are clearly understand to all respondents. Thus, it is necessary to:

- Identify key themes and phrases axis.
- Preparation of a draft preliminary questionnaire
- Arbitration of the questionnaire by presenting it to a number of competent arbitrators for making observations.



- Making adjustments by simplifying and rephrasing questions, separating terminology and not using synonyms, arrangement in proportion to hypotheses.
- Data processing to test stability and reliability.
- Alpha Test Results.

Table (3.3) Question warding

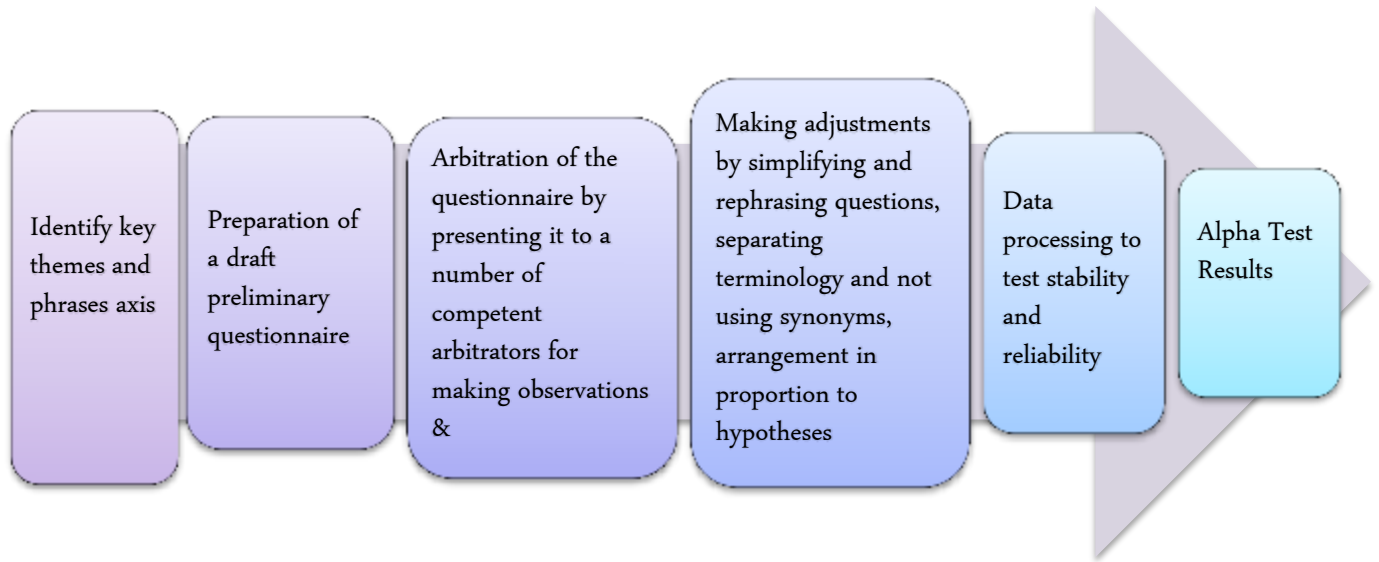
Study Variables	Dimensions	Alpha Cronbach	Number of Statements	source
<b>Integrated Management System</b>	Conformity with the ISO quality management system requirements of ISO 9001: 2008	<b>.848</b>	<b>11</b>	(Mounir, 2011), (Faisal, 2015)
	Conformity with the requirements of the Environment Management System 2004: ISO 14001	<b>.738</b>	<b>6</b>	(Muhammad, 2016)
	Conformity with the Occupational Safety and Health Management	<b>.604</b>	<b>7</b>	Bakhtah Hadar

	System requirements 2007: OHSAS 18001			
<b>Business results</b>	Achieving goals	<b>.872</b>	<b>11</b>	(Hanafi, 2010),
	Employee satisfaction	<b>.829</b>	<b>8</b>	(Iyad, 2011)
	Customer satisfaction	<b>.848</b>	<b>9</b>	(Al-Qarai, 2014),
<b>Human Capital Efficiency</b>	Competencies	Competencies		(Rashad, 2009) ,

Source: prepared by researcher (2019).

Statistical methods used: Statistical techniques

In the statistical analysis process, the statistical packages (v25 SPSS) and AMOSv25 were used to analyze the data. In order to test the quality of the measurements, the Alpha Kronbach coefficient was used to measure the consistency between the components of the scale. The mean and standard deviations were measured to determine the homogeneity between the responses of the sample for all expressions, The correlation was analyzed to identify the nature of the correlation between the variables. The exploratory analysis was used to discover the factors that describe the variables, in addition to the empirical analysis of the hypotheses.



Source: prepared by researcher (2019).

Figure (3.4) Designing and developing questionnaire

## **Stages of application of the system in the sector:**

### **Phase 1: Gap Analysis:**

The consultant, through a team, visited all sections and stations of the sectors, examining the various activities, identifying the processes and carrying out the audit work for all the workplaces and activities in it to know how to implement the existing activities and documents used in the implementation and interview those responsible for these activities. The requirements of the International Standards (IMS ISO 9001: 2008: OHSAS 18001: 2007 & ISO 14001: 2004) according to a specific timetable as well as the differences existing in the management of the correct performance standards in similar local and international institutions with And prestige in this field and to shed light on the strengths and weaknesses of the current performance of the company, as well as the registration and identification of risks posed to individuals: enlighten all employees of the company on the integrated management system requirements

Assisting companies in identifying any additional personnel, equipment and resources requirements that may help to comply with the requirements of international standards and conduct air pollution measurements at sites to be covered by audit programs in the diagnostic review phase.

### **Phase 2: Establishment and Development of the System:**

After completion of the presentation and approval of the work plan in the second phase, the implementation of the work required by the establishment and development of the system and improve performance will begin.

1. The detailed work plan to be implemented and the timing for implementation have been prepared.

2. Formation of the working team from both sides (consultant and company) and attach the CV of the team members by the consultant to be certified auditors and qualified in the field of the three specifications.
3. Setting the policies and setting goals and future visions of the company in general and each department and activity in particular with respect to the quality of performance in order to be compatible with the requirements of the modern administrative systems of quality and environment and occupational health and safety.
4. Re-identify the main tasks of the departments and lines of organization, prepare the organizational structures and job description cards and prepare the integrated manual for job descriptions in a manner that fulfills the responsibilities of these workers for the quality of production and the safety of the environment as well as the safety of equipment, buildings,
5. To define, clarify and document all the necessary operations of the Sudanese Company for Thermal Generation and to define the limits of these processes (inputs, outputs and conditions of their exploitation), as well as to clarify the interrelationship between these processes and departments and re-study these processes in terms of their ability to achieve the objectives, Interlocking and redundant departments that do not have added value and therefore we can prepare the Business Process Manual (standard process / Manual)
6. Identification of the operations carried out by the institution and the definition and documentation of the standards and requirements of the control exercised by the Sudanese Company for thermal generation on the operations that are assigned to the operating company and how to follow up.

7. Clarifying and documenting the criteria for evaluating the processes and activities carried out by the institution and establishing the standard manual for self-evaluation of the work.

8. Documentation and dissemination of IMS policy.

Phase 3: Training and skills development for teams and employees:

The consultant, through a group of distinguished expertise, carried out preliminary training and sensitization to all the officials involved in the work teams, representing all departments and activities in the organization:

1. Concepts of environmental management systems. Training on ISO 14001: 2004 requirements

2. Concepts of quality, environment and occupational health and safety management systems. Training on the requirements of the standard OHSAS 18001

3. How to prepare and documentation systems.

4. Training of operations personnel and implementation of the Integrated Management System.

5. Awareness of the basic concepts and requirements of all local and international standards in the field of integrated system management (IMS: ISO 9001, OHSAS 18001: & ISO 14001)

6. A specialized training course in the measurement of environmental impacts.

7. Rehabilitation and training of internal auditors of the Integrated Management System.

## **The challenges of the electricity industry in Sudan:**

The electricity industry in Sudan has undergone several stages since Sudan became acquainted with electricity through bilateral government. The year 1908 witnessed the establishment of Al Noor Company with foreign capital (private sector) with the installation of 855 kW generators. The electric power sector continued to expand in the cities, To 500 kW.

In 1925, the government contracted with a group of British companies for 30 years to develop electricity, water and transportation services within Khartoum City. Al Nour and Electric Power Company was established. The existing generating units with a capacity of 3000 kW were replaced. In 1952, In the facility management. In 1956, after independence, the company contracted to install 4 additional steam generators at a 30 MW power plant. The first generator was installed and operated in 1958 and the installation and operation of the plant was completed. In 1961, the national government issued the Central Electricity and Water Management Act, followed by the operation of the first hydroelectric power plant in Sennar reservoir with a capacity of 15 MW. In 1970, the largest hydroelectric plant was built after the construction of the reservoir. This was followed by the entry of the other two units in 1971 with a capacity of 30 MW. In 1978 and until 1987, the fourth, fifth, sixth and seventh units were operating respectively with a capacity of 40 MW per unit. In 1975, the National Electricity and Water Authority Law was issued to regulate the electricity and water services nationwide and under the supervision of the Minister of Energy and Mining. The year 1981 witnessed the construction of the Bahri Al-Qadima station, which produces 180 MW of electricity from the United Kingdom. In 1982, National Electricity Authority to oversee the National Grid (Blue Nile + Eastern) and in 1985 the responsibility of supervising the electricity services in the provinces to the National Electricity Authority. The need

for energy continued with the increasing demand for the country as the State began to build new stations in the year The first unit of the service station was launched in 2003 and the plant in the first and second units is 450 MW. The demand for electricity continues with the increase in Sudan and the economic growth witnessed with the start of commercial production of Sudanese oil. A new station was built in villages called 4 villages (110 MW) and continued work in the electricity sector to witness the year 2011 the new station of the new 200 MW.

In 2010, the Ministry of Electricity and dams completed work on the Merowe dam project, which has a design capacity of 1250 MW, added to the national grid, contributing 60% of the national grid loads and stabilizing the electricity supply. The Ministry has worked on the Sadi Complex, Atbara, Kassala and Qadarif states to produce 320 megawatts, which will be used in peak time, as well as the completion of work in three units of a new thermal station located in the area of Om Dabaker designed to produce 500 MW through four units, each producing 125 MW completed work in three of them and linked to the national network is expected to enter Wahat The fourth with the beginning of 2015, next to work at the thermal station in West Kordofan, which has a design capacity of 500 MW and has reached a work rate of more than 30%, which will be completed to provide the states of Darfur with electricity supply.

Although the design capacity of the generation is currently close to 3000 MW, the State is aware of and works to increase the production of electricity and the extension of the national network, in order to achieve the development boom in the sectors of industry, agriculture and services, and increase national output. It came in several stages.



**Summary of the chapter:**

The chapter presents the phenomena under the study, problem statement, research questions, research objectives, theoretical and practical contribution, terms operation definition, and the structure. The following chapter consist the data analysis and techniques.

## **Chapter four**

### **Data Analysis**

#### **4.0 overview**

This Chapter present the results of the data analysis for the main phase of this research design and methodology described in chapter 3. It includes analyzing the characteristics and the attributes of the respondents. This is followed by data screening of all the data collected. Next is assessing the goodness of measures through factor analysis and the internal consistency procedure of reliability analysis, correlation estimation and convergent validity analysis. The following section contains results of CFA, structural model, and mediator's effect test. Finally, results of hypotheses are presented.

#### **4-1: Data Cleaning**

Data cleaning deals with detecting and removing errors and inconsistencies of data in order to improve the quality of data. The need for data cleaning is centered on improving the quality of data to make them “fit for use” by users through reducing errors in the data and improving their documentation and presentation (Chapman, 2005).

Data quality problems are present in single data collections due to misspellings during data entry, missing information or other invalid data. When multiple data sources need to be integrated, or analysis programs need to be used, the need for data cleaning increases significantly. Thus in this study data cleaning is used to manipulates missing data, unengaged responses, and outliers.

## **4-2: Missing Data**

Missing data is common and always expected in the process of collecting and entering data due to lack of concentration and/or the misunderstanding among respondents, and missing information or other invalid data during the entry of that there simply won't be enough data points to run the analysis and particularly in structural equation model (SEM).

Both exploratory and confirmatory factor analysis and path models require a certain number of data points in order to compute estimates. Additionally, missing data might represent bias issues. Some people may not have answered particular questions in survey because of some common issue. If missing data is more than 10% of the responses on a particular variable, or from a particular respondent, that variable or respondent may cause some challenge related to the data. In this study, the proportion of missing data is lower than 10% therefore there no need to remove any of responses.

## **4-3 unengaged responses**

The Sudanese electricity sector in Khartoum state, 10 unfilled questionnaire were returned, 12 questionnaire were partially filled. Unengaged responses means some responses giving same answer for all the questionnaire it seems to be random answers, in this case we use standard deviation to find out any unengaged response this means that any standard deviation of responses less than 0.5 when Likert's five point scale is used just deleted. Therefore, we don't removed any items in dataset because all items in dataset is different for ot

**Table (4.1) the Responses Rate**

Total Questionnaires	200
Returned questionnaires	190
Blank questionnaires returned without participation	10
Partially filled	12
Questionnaires not returned	10
Not valid questionnaires	15
Total usable questionnaires	153
Over all response rate	77%

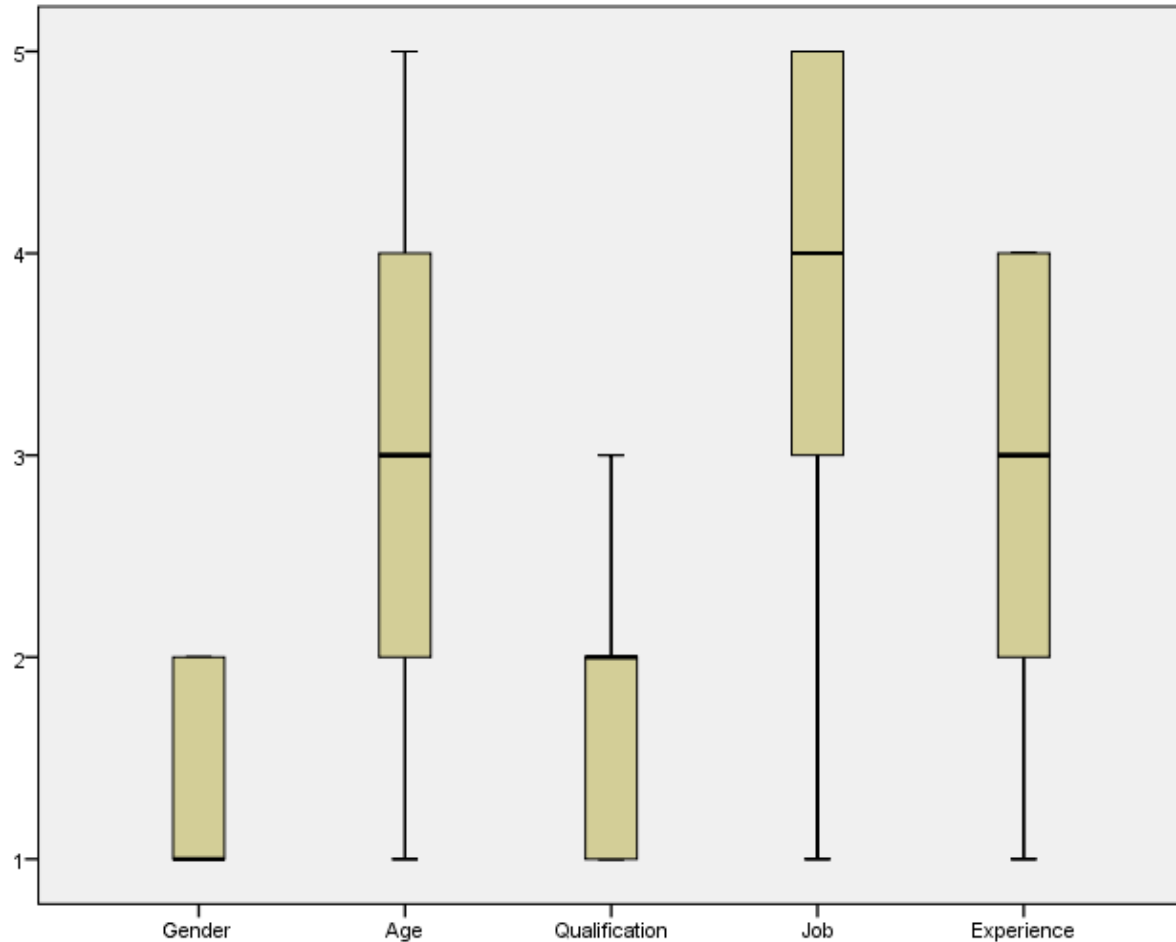
*Source: prepared by researcher 2019*

#### **4-4: DATA SCREENING**

Before performing the fundamental analysis it is important to decide on characteristics of the data may have

##### **4.4.1 Outliers**

A case with such an extreme value on a variable or such strange combination of scores on several variables that it distorts the statistic. Outliers in the dataset can influence the results of analysis. If there is a really high sample size, the need for removing the outliers is needed. However, in this dataset outliers were checked as showed in figure 5.1 but no change was made because there was no any outliers on dataset everything in dataset is logic



**Figure (4.1) Outliers**

## 4.5 Variable Screening

### 4.5.1. Missing data in columns

Some missing values were observed in the following variables but the biggest value in (value3) is missing (3). Therefore median value was used for respondent to impute the missing value.

### 4.5.2 Skewness & Kurtosis

Low levels of skewness and kurtosis indicated data normality. All items showed skewness and kurtosis close to |3| or less (Boomsma and Hoogland, 2001),

However, the observed kurtosis of the study variables values ranged from 3. While this violate strict rules of normality, it is within more normal rules suggested by Esposito (1983) who recommend 3.3 as the upper threshold for normality.

#### 4-6 characteristics of respondents

Sample characteristics include five major items in this study: (1) Gender, (2) Age, (3) Qualification, (4) job, (5) Experience years. Table 4-2 shows the results obtained for each variable is listed according to the survey categories in the table.

**Table (4.2) Analyzing results of demographic variables**

Variables	Valid	Frequency	Percentage%
Gender	Male	90	58.8
	Female	63	41.2
Total		153	100%
Age	25 -30	20	21.6
	31-35	24	25.5
	41-50	33	15.7
	51 and over	39	24.2
Total		153	100.0%
Qualification	Bachelor	71	46.4
	Master	52	34.0
	Doctorate	30	19.6
		153	100.0%
JOB	Gen. Dep. Manager	3	2.0
	Dep. Manager	18	11.8
	Section Manager	25	16.3
	Unit Chief	34	22.2
	Other	73	47.7
Total		153	100.0

Experience	5 and less	34	22.2
	5 and less than 10	31	20.3
	10 and less than 15	14	9.2
	15 and over	74	48.4
Total		153	100.0

Source: prepared by researcher, (2019).

The table (4.2) show The respondents characteristics ' in term of Gender most of the respondents were Male 90% and the female were found (41.2%) , with regard to respondents' ages (25.5%) were found between 31-35, (24.2%) their ages between 25-30 year's (21.6%) between 41-50 years, and (15.7%) theirs age between 36-40years. Concerning the respondents qualification (46.4%) of the have a bachelor degree, while (34%) have master degree ,while (19.6%) have doctorate degree regarding The respondents' Experience (48.4%) have 15 and over years of experience, followed by (22.2%) have experience between 5 and less, (20.3%) their experience between 5 and less than 10, (9.2 %) between 10 and less than 15 years of experience. In term of job title (47.7%) of respondents were other,(22.2%) were Unit Chief,(16.3%) Section Manager, (11.80%) Dep. Manager, and (2.0%) G. managers.

#### 4.7 Goodness of measures

This section, reports the results of validity and reliability tests as a means to assess the goodness of measure in this study constructs (Sekaran, 2003). The study used exploratory factor analysis (EFA) and (CFA) confirmatory factor analysis. The following are the detailed information of each

#### **4.7.1 Exploratory factor analysis for independent variable (EFA)**

Exploratory Factor Analysis (EFA) is a statistical approach for determining the correlation among the variables in a dataset. This type of analysis provides a factor structure (a grouping of variables based on strong correlations). In general, an (EFA) prepares the variables to be used for cleaner structural equation modeling (SEM). This means the (EFA) will be able to spot problematic variables much more easily than the (CFA). Therefore, this study used exploratory factor analysis for testing the validity and uni-dimensionality of variables measurements, as (Lowry & Gaskin, 2014) assumptions as follow:

Ø There must be a clean pattern matrix.

- Adequacy.
- Convergent validity.
- Discriminant validity.
- Reliability.

Principal Component was used, the summary of results was showed in Table (5.4) and the SPSS output attached in appendix. As shown in Table (5.4) below all the remaining items has more than recommended value of at least 0.5 in measure of sample adequacy (MSA) with (KMO) (above the recommended minimum level of 0.60), and Bartlett's test of sphericity is significant ( $p < .01$ ). Thus, the items are appropriate for factor analysis.

#### **4.7.2 Convergent validity**

Convergent validity means that the variables within a single factor are highly Correlated. This is evident by the factor loadings. Sufficient/significant loadings Depend on the sample size of dataset.



### **4.7.3 Discriminant validity**

Discriminant validity refers to the extent to which factors are distinct and uncorrelated. The rule is that variables should relate more strongly to their own factor than to another factor. Two primary methods exist for determining discriminant validity during an (EFA). The first method is to examine the rotated component matrix instead of Varimax with Kaiser Normalization, when principle component used. Variables should load significantly only on one factor. If cross loading exist (variable loads on multiple factors) then the cross loading should differ by more than 0.5. The second method is to examine the factor correlation matrix. The correlation between factors should not exceed 0.7. The following Table (5.8) shows the Discriminant validity.

### **4.7.4 Exploratory factor analysis for independent variable (EFA)**

Exploratory Factor Analysis (EFA) is a multivariate technique for analyzing the structure of inter relationships among a large number of variables by defining sets of variables that are highly interrelated (Hair et al., 2009). These groups of variables are known as factors and are assumed to represent dimensions within the data. In this way, EFA is able to determine whether the information derived from the dataset could be summarized in a smaller set of components (factors). EFA has an exploratory character because the researcher has little control over the specification of the structure (Hair et al., 2009). EFA is primarily used when the relationships between the observed and the latent variables (factors) are unknown or uncertain (Gounaris et al., 2004). In this section of our study, EFA will be used two fold. First, our aim is to derive a preliminary factorial structure of Integrated Management System. Secondly, as previously saw in the Methodology (chapter

3), the variables scales of questions were adapted from previous studies. EFA will be applied in order to refine the latent constructs of the variables examined and guarantee convergent and discriminant validity. The EFA results will be confirmed through Confirmatory Factor Analysis (CFA) in the next section of the study and then the derived factors will be included in the structural model for the examination of the relationships between the Variables. We using Principal Component Analysis., the summary of results was showed in Table (5.4) and the SPSS output attached in appendix. As shown in Table (4.3) below all the remaining items has more than recommended value of at least 0.45 in measure of sample adequacy (MSA) with (KMO) (above the recommended minimum level of 0.60), and Bartlett’s test of sphericity is significant ( $p < .01$ ). Thus, the items are appropriate for factor analysis.

**Table (4.3): Exploratory factor analysis for independent variables (Integrated Management System IMS)**

<b>Items names:</b>	<b>F1</b>	<b>F2</b>
<b>Integrated Management System (IMS)</b>	.811	.336
The analysis and measurement processes are carried out to continuously improve system	.796	.320
Preventive actions are taken to remove and prevent expected nonconformities.	.783	.369
Corrective actions are performed to remove nonconformities and prevent its recurrence.	.736	.239
Work-place is safe and free from hazardous exposures.	.707	.291
System is documented (processes and Procedures) and	.682	.498

effectiveness.		
Companyis committed to providing necessary resources to achieve system requirements.	.573	.465
Employees are aware and cultured of occupational safety and health at work field	.264	.814
Company determines environmental aspects that significantly impacts on environment.	.328	.786
Company is fully aware of legal and regulating legislation regarding environmental aspects	.249	.735
Integrated management system is implemented as a tool of continuous improvement	.389	.718
Policy provides a framework for developing and reviewing environmental goals	.366	.695
Total Variance Explained (%)	66.948	
Kaiser-Meyer-Olkin (KMO)	0.921	
Bartlett's Test of Sphercity	1401.774	

#### 4.7.5 Discriminant validity

Discriminant validity refers to the extent to which factors are distinct and uncorrelated. The rule is that variables should relate more strongly to their own factor than to another factor. Two primary methods exist for determining discriminant validity during an (EFA). The first method is to examine the rotated component matrix instate of pattern matrix when principle component used. Variables should load significantly only on one factor. If cross loading do exist (variable loads on multiple factors) then the cross loading should differ by more than 0.5. The second method is to examine the factor correlation

matrix. The correlation between factors should not exceed 0.7. The following Table (4.4) shows the Discriminant validity.

#### **4.8.6 Exploratory factor analysis for mediating Human Capital Efficiency variable (EFA)**

We using Principal Component., the summary of results was showed in Table (5.5) and the SPSS output attached in appendix. As shown in Table (5.5) below all the remaining items has more than recommended value of at least 0.5 in measure of sample adequacy (MSA) with (KMO) (above the recommended minimum level of 0.60), and Bartlett’s test of sphericity is significant ( $p < .01$ ). Thus, the items are appropriate for factor analysis.

**Table (4.4): Exploratory factor analysis for Mediator variables Human Capital Efficiency HCE**

<b>Items names:</b>	<b>F1</b>
<b>Human Capital Efficiency</b>	.823
Employees is judged to be competent according to personal qualities and ability to perform entrusted tasks.	.819
Company has competencies that are not possessed by competitors.	.794
Employees have abilities to contribute to achievement of strategic goals.	.771
Employees respond quickly to change.	.764
Company requires employees who perform works affecting product quality appropriate skill, experience and competence.	.756
Company considers recruitment and maintaining of competent employees.	.750
Company supports employees learning new skills that increase their performance quality.	.823

Total Variance Explained (%)	61.295
Kaiser-Meyer-Olkin (KMO)	0.872
Bartlett's Test of Sphericity	562.606

#### 4.8.7 Exploratory factor analysis for dependent variable (EFA)

The study employed Principal Component., the summary of results was showed in Table (5.6) and the SPSS output attached in appendix. As shown in Table (5.6) below all the remaining items has more than recommended value of at least 0.45 in measure of sample adequacy (MSA) with (KMO) (above the recommended minimum level of (0.60), and Bartlett's test of sphericity is significant ( $p < .01$ ). Thus, the items are appropriate for factor analysis.

**Table (4.5): Exploratory factor analysis for dependent variables (Business Results)**

Items names:	1	2	3	4
<b>Customer's Satisfaction</b>				
Implementing system reduced customers' and local community's complaints.	.802	-.021	.076	.252
Company is keen to maintain its customers and increase their loyalty	.790	.107	.222	.132
Company improved mental image of customers	.760	.108	.143	.209
Product presented by company's management fulfills customers' needs.	.737	.245	.354	.007
Company has a clear mechanism to deal with customer complaints and deal with them professionally.	.728	.278	.326	.013

Company uses information technology systems to handle customer's complaints.	.661	.185	.444	-.083
<b>Employee's Satisfaction</b>				
Company enhances communication between employees.	.106	.810	.203	.144
Company aims at achieving satisfaction of all employees.	.062	.785	.192	.265
Workload is commensurate with entrusted to employees tasks.	.308	.741	.063	.193
Company is keen to develop employees' abilities and competences through appropriate	.463	.659	-.019	.088
Company provides moral support by motivating employees.	-.057	.643	.288	.391
<b>Business Results: Achieving Goals</b>				
Vision is in line with the values of society.	.368	.119	.778	.108
Application of Integrated Management System increased	.232	.141	.735	.280
Adoption of integrated management system contributed to development, quality assurance and continuous improvement.	.228	.270	.684	.197
Vision and mission are published and clear.	.230	.080	.641	.382
Occupational injuries and hazardous exposures are few	-.024	.337	.059	.757
Reduce wasted hours.	.103	.137	.236	.752
Implementing system at company decreased waste of resources.	.243	.171	.201	.698
Emissions and pollution rate decreased	.235	.309	.333	.523

Total Variance Explained (%)		67.587
Kaiser-Meyer-Olkin (KMO)		0.865
Bartlett's Test of Sphercity		1722.163

#### 4.9 Reliability Analysis

This study used Cronbach's alpha as diagnostic tool to assess the degree of internal consistency between multiple measurements of variables. (Hair et al, 2010) stated that the lower limit for Cronbach's alpha is 0.70, although it may decrease to 0.60 in exploratory research. While Nunnally (1978) considered Cronbach's alpha values greater than 0.60 are taken as reliable. Given that, Cronbach's alpha has been the most widely used measure (Sharma, 2000). Table (4.5) presents the summary of the results for reliability analysis. Confirmed that all the scales display the satisfactory level of reliability (Cronbach's alpha exceed the minimum value of 0.60). Therefore, it can be concluded that the measures have acceptable level of reliability. The full SPSS output showed in Appendix.

**Table (4.6): Cronbach's alpha value:**

Variable	No of items	Cronbach's alpha
Conformity to ISO 9001:Quality Management Systems Requirements	<b>7</b>	<b>.914</b>
Conformity to Environmental Management System Requirements ISO 14001	<b>6</b>	<b>.899</b>
Business Rrsults:: Achieving Goals	<b>4</b>	<b>.843</b>

Business Rrsults:: Achieving Goals	<b>4</b>	<b>.793</b>
Employee's Satisfaction	<b>5</b>	<b>.858</b>
Customer's Satisfaction	<b>6</b>	<b>.899</b>
Human Capital Efficiency	<b>6</b>	<b>.873</b>

#### **4.10 Confirmatory factor analysis for independent variables**

CFA is a multivariate data analysis technique that examines and confirms how well the observed variables estimate or reflect fewer factors (latent constructs) that can't be estimated directly (Hair *et al.*, 2009). Contrary to EFA, CFA is a technique with a confirmatory character and addresses the situation when a researcher specifies a model a priori, and tests the conjecture that a relationship between the observed and the latent variables does in fact exist. In the case of CFA, the researcher has a good knowledge about the number of factors that explains the inter-correlations between observed variables. EFA examine the validity of the measurement model which is the operationalization of latent constructs by sets of measured variables. Assessing measurement model validity includes the following steps which are commonly used in literature (e.g., Hair *et al.*, 2009; Liu *et al.*, 2009; Rokkan *et al.*, 2003).

- Examination of the measurement model's overall fit (whether our data fit the hypothesized model well).
- Examinations of the measurement model's construct validity. Construct validity is assessed through:



- Convergent validity. According to convergent validity, the measured variables of a latent construct should share a high proportion of variance and is estimated through:
  - Factor loadings
  - Variance extracted
  - Construct reliability
- Discriminant validity. It helps us examine whether latent constructs which according to the theory shouldn't be correlated, are indeed uncorrelated according to our data. Thus, with discriminant validity we examine the degree of differentiation between latent constructs.

The CFA of the all variables In this section of the study we will employ CFA in two cases. Firstly, we will validate the results of the two EFAs from the previous section. The CFA of the all variables will also test alternative models with the same number of items but with different factorial structure in order to better validate our model. Secondly we will validate our whole measurement model including both the determinants and the factors of all variables . The second case is necessary in order to test the validity of our measurement model as a whole. Once validity is achieved we could proceed to SEM and the examination of the impact of the variables. will also test alternative models with the same number of items but with different factorial structure in order to better validate our model. Secondly we will validate our whole measurement model including both the determinants and the factors of all variables . The second case is necessary in order to test the validity of our measurement model as a whole. Once validity is achieved we could proceed to SEM and the examination of the impact of the variables.

In the (EFA) explore the factor structure (how the variables relate and group based on inter-variable correlations); in the (CFA) we confirm the factor structure we extracted in the (EFA). All the items in Table (4.5) were used to conduct confirmatory factor analysis with maximum likelihood and promax.

**4.10.1 CFA Integrated Management System**

Our first CFA model encompasses the three factors derived from the EFA: Integrated Management System (Quality Management System ISO 9001, Environment Management System ISO 14001, Occupational safety & health management system OHSAS 18001) Was merged dimensions (Quality Management System ISO 9001 AND Occupational safety & health management system OHSAS 18001)

**4.10.2 Model fit**

Model fit refers to how well the proposed model accounts for the correlations between variables in the dataset. If the accounting for all the major correlations inherent in the dataset (with regards to the variables in the model), then the model will have a good fit. If not, then there is a significant “discrepancy” between the correlations proposed and the correlations observed, and thus have poor model fit. There are specific measures that can be calculated to determine goodness of fit. The thresholds listed in the table (5.10) below are simply a guideline.

**Table (4.7) measures to determine goodness of model fit**

Measure	Threshold
Chi-square/degree of freedom(cmin/df)	< 3 good; < 5 sometimes permissible
P-value for model	>.05

CFI	>.95 great; >.90 traditional; >.80 sometimes permissible
GFI	>.95
AGFI	>.80
SRMR	<.09
RMSEA	<.5 good; .05-.10 moderate;> 10 bad
P Close	>.05

Source: Adopted from (Gaskin, 2016)

In Figure 5.2 we can see the CFA model of the TWO factors of IMS. The model includes two latent variables (i.e., the tow factors of Integrated Management System) and seven observed items. Based on the thresholds listed in Table (4.7) above and Table (5.11) the confirmatory factor analysis (CFA) was run to check the validation of the measurements, and convergent validity. Table (4.7) presents the measures and of the model fit.

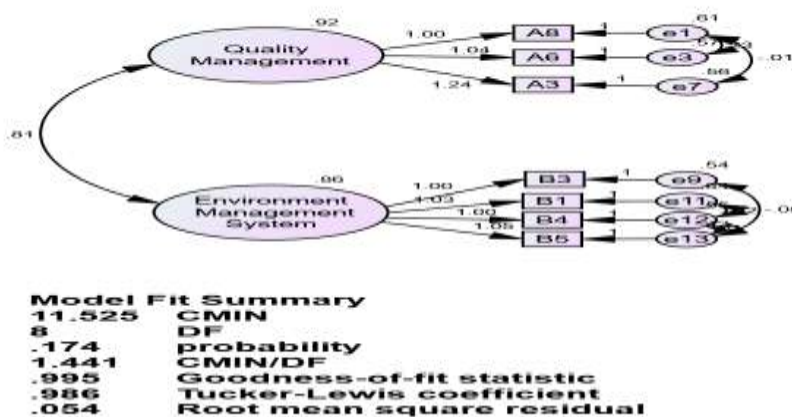


Figure ( 4.2) Path diagram for the model

Table 4.11 shows the CFA results of EFC measurement models. After modifying the model The indices for overall model fit suggest good model fit: the CFI, 0.995; SRMR, 0.023; RMSEA,0.054. The standardized regression weights were all significant at the 0.05 significance level and greater than 0.7 ranging from 0.853 to 0.870. CR and Chronbach’s alpha values were all higher than 0.7 and AVE values were also higher than 0.5, indicating scale reliability.

**Table (4.8) Model Fit Measures**

Measure	Estimate	Threshold	Interpretation
CMIN	11.525	--	--
DF	8.000	--	--
CMIN/DF	1.441	Between 1 and 3	Excellent
CFI	0.995	>0.95	Excellent
SRMR	0.023	<0.08	Excellent
RMSEA	0.054	<0.06	Excellent
PClose	0.404	>0.05	Excellent

Congratulations, your model fit is excellent!

**Table (4.9) Cutoff Criteria\***

Measure	Terrible	Acceptable	Excellent
CMIN/DF	> 5	> 3	> 1
CFI	<0.90	<0.95	>0.95
SRMR	>0.10	>0.08	<0.08
RMSEA	>0.08	>0.06	<0.06
PClose	<0.01	<0.05	>0.05

### 4.10.3 CFA Business results

Our first CFA model encompasses the three factors derived from the EFA: Business results (Achieving goals, Employees' satisfaction, and Customer's satisfaction)

### 4.10.4 Model fit

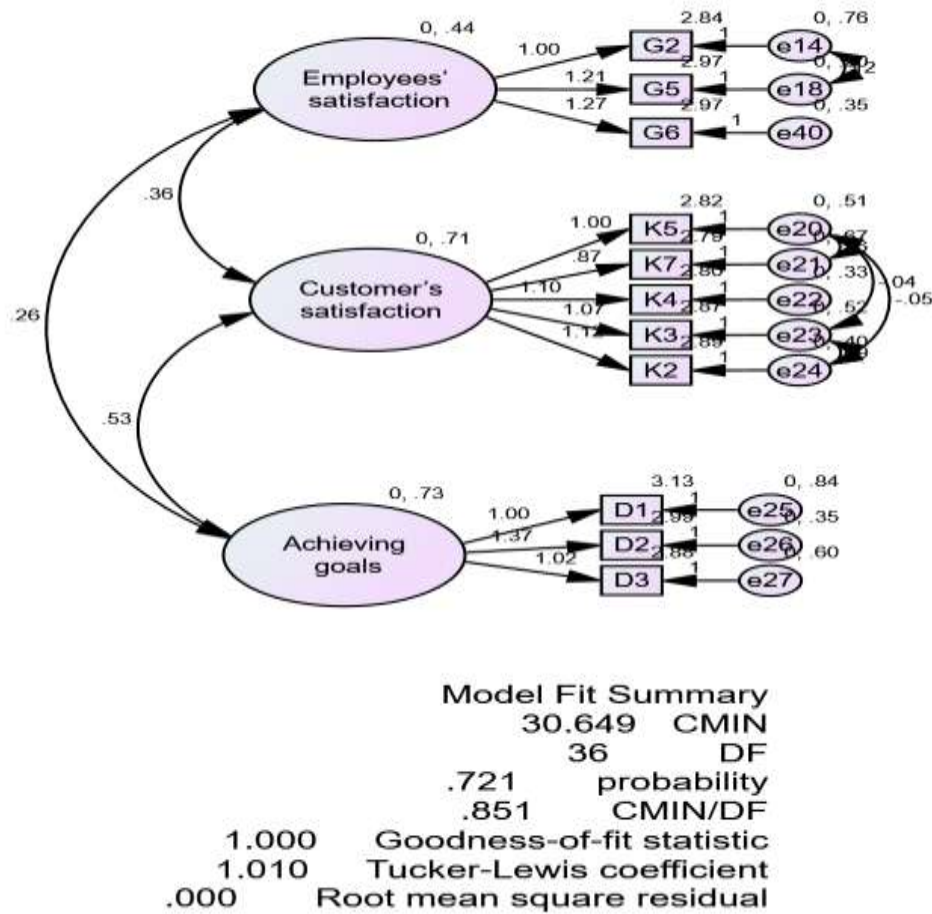
Model fit refers to how well the proposed model accounts for the correlations between variables in the dataset. If the accounting for all the major correlations inherent in the dataset (with regards to the variables in the model), then the model will have a good fit. If not, then there is a significant “discrepancy” between the correlations proposed and the correlations observed, and thus have poor model fit. There are specific measures that can be calculated to determine goodness of fit. The thresholds listed in the table (5.10) below are simply a guideline.

**Table (4.10) measures to determine goodness of model fit**

Measure	Threshold
Chi-square/degree of freedom(cmin/df)	< 3 good; < 5 sometimes permissible
P-value for model	>.05
CFI	>.95 great; >.90 traditional; >.80 sometimes permissible
GFI	>.95
AGFI	>.80
SRMR	<.09
RMSEA	<.5 good; .05-.10 moderate;> 10 bad
P Close	>.05

*Source: Adopted from (Gaskin, 2016)*

In Figure 5.3 we can see the CFA model of the three factors of Business results. The model includes three latent variables (i.e., the three factors of Business results) and twelve observed items. Based on the thresholds listed in Table (4.10) above and Table (5.11) the confirmatory factor analysis (CFA) was run to check the validation of the measurements, and convergent validity. Table (5.10) presents the measures and of the model fit.



**Figure (4.3) Path diagram for the model**

Table 4.11 shows the CFA results of EFC measurement models. After modifying the model The indices for overall model fit suggest good model fit: the CFI, 1.00; SRMR, 0.000; RMSEA,0.00. The standardized regression weights were all significant at the 0.05 significance level and greater than 0.7 ranging from 0.775 to 0.886. CR and Chronbach’s alpha values were all higher than 0.7 and AVE values were also higher than 0.5, indicating scale reliability.

**Table (4.11) Model Fit Measures**

Measure	Estimate	Threshold	Interpretation
CMIN	30.649	--	--
DF	36.000	--	--
CMIN/DF	0.851	Between 1 and 3	Need more DF
CFI	1.000	>0.95	Excellent
RMSEA	0.000	<0.06	Excellent
PClose	0.970	>0.05	Excellent

Congratulations, your model fit is excellent!

**Table (4.12) Cutoff Criteria\***

Measure	Terrible	Acceptable	Excellent
CMIN/DF	> 5	> 3	> 1
CFI	<0.90	<0.95	>0.95
RMSEA	>0.08	>0.06	<0.06
PClose	<0.01	<0.05	>0.05

#### 4.10.5 CFA Human Capital Efficiency

Our first CFA model encompasses the three factors derived from the EFA: Human Capital Efficiency

#### 4.10.6 Model fit

Model fit refers to how well the proposed model accounts for the correlations between variables in the dataset. If the accounting for all the major correlations inherent in the dataset (with regards to the variables in the model), then the model will have a good fit. If not, then there is a significant “discrepancy” between the correlations proposed and the correlations observed, and thus have poor model fit. There are specific measures that can be calculated to determine goodness of fit. The thresholds listed in the table (5.10) below are simply a guideline.

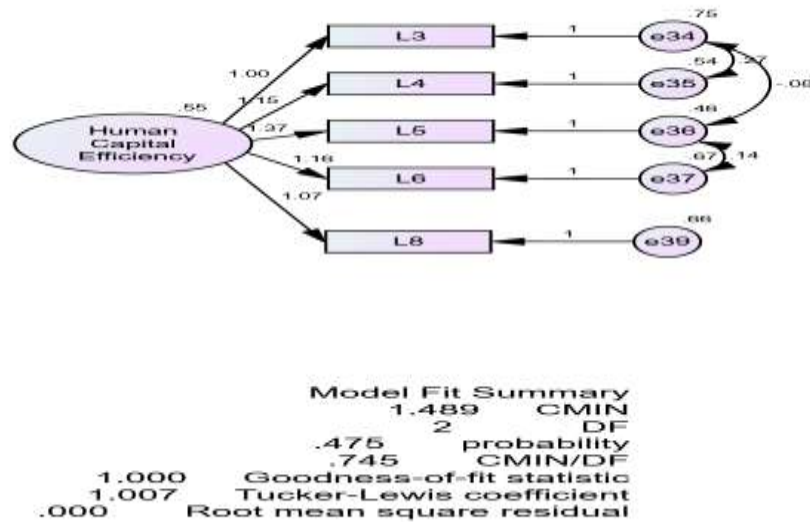
**Table (4.13) measures to determine goodness of model fit**

Measure	Threshold
Chi-square/degree of freedom(cmin/df)	< 3 good; < 5 sometimes permissible
P-value for model	>.05
CFI	>.95 great; >.90 traditional; >.80 sometimes permissible
GFI	>.95
AGFI	>.80
SRMR	<.09
RMSEA	<.5 good; .05-.10 moderate;> 10 bad
P Close	>.05

*Source: Adopted from (Gaskin, 2016)*



In Figure 5.3 we can see the CFA model of the one factors of Human Capital Efficiency. The model includes one latent variables (i.e., the one factors of Human Capital Efficiency) and five observed items. Based on the thresholds listed in Table (4.10) above and Table (5.11) the confirmatory factor analysis (CFA) was run to check the validation of the measurements, and convergent validity. Table (5.10) presents the measures and of the model fit.



**Figure (4.4) Path diagram for the model**

Table 4.11 shows the CFA results of EFC measurement models. After modifying the model The indices for overall model fit suggest good model fit: the CFI, 1.00; SRMR, 0.000; RMSEA,0.00. The standardized regression weights were all significant at the 0.05 significance level and greater than 0.7 ranging from 0.853. CR and Chronbach’s alpha values were all higher than 0.7 and AVE values were also higher than 0.5, indicating scale reliability

**Table (4.14) Model Fit Measures**

Measure	Estimate	Threshold	Interpretation
CMIN	1.489	--	--
DF	2.000	--	--
CMIN/DF	0.745	Between 1 and 3	Need more DF
CFI	1.000	>0.95	Excellent
RMSEA	0.000	<0.06	Excellent
PClose	0.594	>0.05	Excellent

Congratulations, your model fit is excellent!

**Table (4.15) Cutoff Criteria\***

Measure	Terrible	Acceptable	Excellent
CMIN/DF	> 5	> 3	> 1
CFI	<0.90	<0.95	>0.95
RMSEA	>0.08	>0.06	<0.06
PClose	<0.01	<0.05	>0.05

#### **4.10.4 Reliability and Validity**

To evaluate the reliability and validity of the measurement instrument, several statistical analyses were conducted. To verify scale reliability, Composite Reliability (CR) and Cronbach's alpha were engaged. Table (5.12) shows that all

CR and Cronbach's alpha values have exceeded the minimum requirement of 0.70. Therefore, the measurement instrument has a high level of reliability (Lee, Foo, Leong, & Ooi, 2016). In terms of convergent validity, the Average Variance Extracted (AVE) for all scales is greater than the suggested threshold 0.5 as recommended by (Fornell & Larcker, 1981) indicating sufficient convergent validity of the measurement instrument. To evaluate discriminant validity the calculation of (AVE) showed that the correlation of the construct with its measurement items is greater than its correlation with the other constructs (Lowry & Gaskin, 2014) the diagonal boldface of Table (5.12) showed that all square root of AVE is greater than their respective correlation coefficients. Hence, the measurement instrument has a high level of discriminant validity. Table (5.12) shows the details of the above mentioned. Table (5.13) validity and reliability test

**Table (4.16) Model Validity Measures:**

	CR	AVE	MSV	MaxR(H)	F1	F2	F3	F4	F5	F7
<b>F1</b>	0.853	0.660	0.804	0.858	<b>0.812</b>					
<b>F2</b>	0.870	0.626	0.811	0.875	0.897***	<b>0.791</b>				
<b>F3</b>	0.775	0.538	0.480	0.795	0.576***	0.590***	<b>0.733</b>			
<b>F4</b>	0.886	0.610	0.698	0.896	0.796***	0.836***	0.637***	<b>0.781</b>		
<b>F5</b>	0.820	0.607	0.613	0.859	0.773***	0.783***	0.455***	0.728***	<b>0.779</b>	
<b>F7</b>	0.853	0.539	0.811	0.860	0.819***	0.900***	0.693***	0.811***	0.740***	<b>0.734</b>

## **4.11 Structural Equation Modeling**

The Structural Equation Modeling (SEM) methodology provides a reliable way of testing the theory (Hair et al., 2009; Byrne, 2001). The researcher may express theory in the form of relationships (structural model) between measured variables and non-observable latent constructs and then SEM can assess whether the observed data confirm the theoretical assumptions. In this section SEM will apply for examining the relationships between the independent Variables , dependent variables, and Mediator. in the structural model, the impact of the dependent and mediator variables will examine.

### **4.11.1 Multivariate Assumptions**

#### **1- Outliers and Influential**

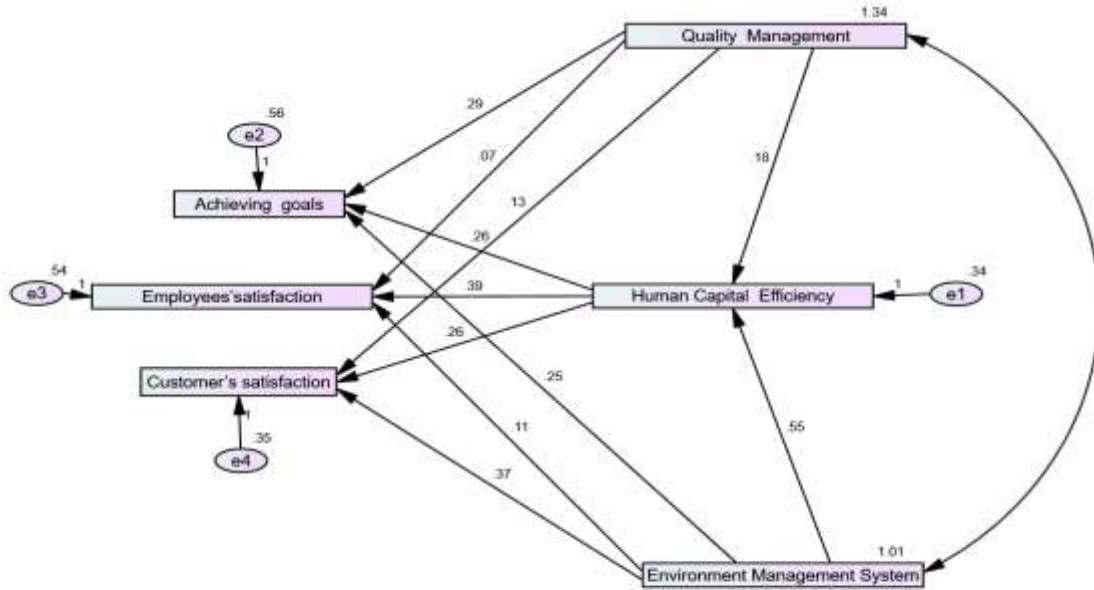
a cooks distance analysis was run to determine if any (Multivariate) influential Outliers existed. And six cases removed according to cooks distance greater than 0.100.is (98,174)

### **4.11.2 Multi collinearity**

The variable inflation factors for all predictor on dependent variable was examined and observed no VIFs greater than 2.3, which is far less than the threshold of 10. Conceptual Framework and Hypotheses As a result of factor analysis the proposed Framework of this study had been as its in figure (5.3)

#### **Figure (5.7): The Conceptual Framework.**

As a result of factor analysis the proposed Framework of this study had been as its in figure (5.3)



**Figure (4.5): The Conceptual Framework.**

#### 4.12 Descriptive Analysis of model

The following Table (5.18) presents the level or perceptions of the sampled, value co-creation and the level of business result (Likert-type scale: 1 indicates “Strongly disagree” and 5 strongly agree). Thus, for each level or perceptions Table 5.18 presents the mean, standard deviation, of the firms that answered the statements of the variables measures. Table 4.18 shows the means and standard deviations that the scale used a 5 -point scale (5=strongly disagree, 1=strongly agree).

**Table (4.17) Descriptive Analysis of the model**

	Mean	Std. Deviation	N
Quality Management	3.0065	1.15942	153
Environment Management System	3.0605	1.00820	153
Achieving goals	3.0000	1.07129	153
Employees 'satisfaction	2.9281	.89585	153
Customer's satisfaction	2.8340	.93296	153
Human Capital Efficiency	2.9425	.93546	153

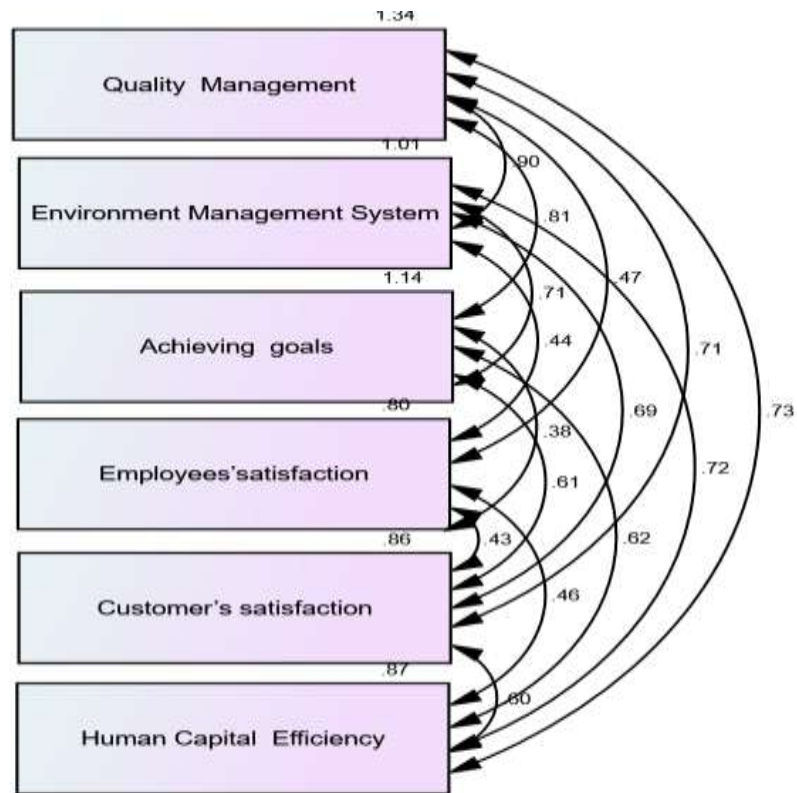
*Note: All variables used a 5-point likert scale*

*(1= strongly disagree, 5= strongly agree)*

### **4.13 Correlation Analysis**

The zero-order correlation was conducted for all dimensions of the constructs operationalized in this study using bivariate correlations. These bivariate correlations allow for preliminary inspection of hypothesized relationships. Table 4-18 presents that all the hypothesized relationships are in positive correlations.. Based on the bivariate correlations there was some expectation that these coefficients would be significant. The full AMOS output is attached in Appendix().

**Table (5.4) Person's correlation coefficient for all variables.**



**CORRELATION Model Fit Summary**  
**.000 CMIN**  
**0 DF**  
**\p probability**  
**\cmindf CMIN/DF**  
**1.000 Goodness-of-fit statistic**  
**\tli Tucker-Lewis coefficient**  
**\rmsea Root mean square residual**

**Figure (4.6) The correlation diagram**

**Correlation Analysis:**

SEM is capable of explaining both direct and indirect effects between latent variables (Jöreskog & Sörbom, 2001). Therefore, we will also examine possible indirect correlation of the variables to each other as well. Table 5.19 displays the correlations between the study's constructs to provide a general picture of inter-correlations.

## Correlation Analysis

The correlation analysis was conducted on the field study data to determine the preliminary picture of the inter-linkages between the study variables. The closer the correlation is to the correct one, the stronger the correlation between the two variables. The lower the degree of correlation than the correct one, the weaker the relationship between the two variables. The relationship may be positive or negative. In general, the relationship is weak if the correlation coefficient value is less than 0.30. The correlation between 0.30 and 0.70 is significant. The relationship is strong if the correlation coefficient is more than 0.70. The following table (20.4) shows the correlations between the variables of the study.

Table (20.4) shows that the correlation between the dimensions of the independent variable and the integrated management system between them is that after the quality management system is positively and significantly correlated with the dimension of the environmental management system where the correlation value = 0.772, The dependent variable was the results of the business (achieving goals, employees` satisfaction, and customers` satisfaction). The correlation value was (0.657), (0.436) and (0.659) respectively. It also has an average correlation with the median variable intrinsic abilities after the competencies and the correlation value = (0.682).

It is noted from Table (20.4) that after the independent variable, the environment management system is positively and moderately correlated with the dimensions of the dependent variable. The business results of the (achieving goals and employee ,customer satisfaction). The correlation value respectively = (0.657), (0.492) After the customer satisfaction, the value of correlation = (0.736), with the mean variable Human Capital Effieciancy after competencies, the correlation was significant, where the correlation value = (0.766). Table (20.4)



shows that the correlation between the dimensions of the dependent variable and the business results after achieving goals has a significant positive correlation with the dimensions of the dependent variable (employee satisfaction, customer satisfaction). The correlation value is (0.401), (0.613) with the median variable Human Capital Efficiency after competencies, the correlation was significant mean where the correlation value = (0.626).

Table (20.4) shows that the correlation between the post-dependent variable and the satisfaction of the employees was significant and the correlation was (0.468). It is noted from Table (20.4) that the correlation between the dependent variable dimension and the business results after customer satisfaction has a mean correlation with the mean variable after the correlation (0.6

**Table (4.18) Person's Correlation Coefficient for All variables**

Correlations	Quality Management	Environment Management System	Achieving goals	Employees 'satisfaction	Customer's satisfaction	Human Capital Efficiency
Environment Management System	.772**	1				
Achieving goals	.657**	.657**	1			
Employees 'satisfaction	.455**	.496**	.394**	1		
Customer's satisfaction	.659**	.736**	.613**	.515**	1	
Human Capital Efficiency	.682**	.766**	.626**	.555**	.689**	1

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

As shown in table (5.19) above the correlation analysis provides strong indicators of associations, thus for more examination of the proposed relationships path analysis through structural equation model (SEM) was conducted to give the best predictive model of the relationship between the variables. In the following, the hypotheses testing which is represent last part of data analysis and findings.

#### **4.14 Hypotheses Testing**

This section discusses the results of hypotheses of the study. The hypotheses were tested with the path analysis that discloses the effect of independent variables on dependent variables and the effect of mediator in relationships between variables through the structural equation modeling (SEM) that grows out of and serves purposes similar to multiple regression, but in more powerful way which takes in account the modeling of interactions between variables, nonlinearities, correlated independents, measurement error, correlated error terms, multiple latent independents each measured by multiple indicators, and one or more latent dependents also each with multiple indicators (Gaskin, 2016). SEM may be used as a more powerful alternative to multiple regression, path analysis, factor analysis, time series analysis, and analysis of covariance. these procedures may be seen as special cases of SEM, or, to put it another way, SEM is an extension of the general linear model (GLM) of which multiple regression is a part. Given that the variables appeared in confirmatory factor analysis encompasses 80 hypotheses in this study. The main effects as well as the mediating effect were examined using path analysis, the statistical procedures of which had been explained in chapter

In order to perform path analysis, it is generally agreed that there are at least the assumptions of model fit should be met. It's given that the model fit was done in (CFA), however the need to do it again in structural model is important in order

to demonstrate sufficient exploration of alternative models (Gaskin, 2016). Every time the model changes and a hypothesis are tested, model fit must be assessed. Thus the Absolute fit indices and Incremental fit indices assumptions are provided below:

#### **4.14.1 Absolute fit indices**

Absolute fit indices provide the most fundamental indication of how well the proposed theory fits the data, it includes indices like the Chi-Squared test, RMSEA, GFI, AGFI, the RMR and the SRMR the information about each are in the following sub sections.

#### **4.14.2 The relative/normed chi-square/df ( $\chi^2/df$ )**

Due to the restrictiveness of the Model Chi-Square (Hooper, Coughlan, & Mullen, 2008) indicates that researchers have sought alternative indices the relative/normed chi-square ( $\chi^2/df$ ) which means (the model calculated value of chi-square divided by the degree of freedom), as one example of statistic that minimizes the impact of sample size on the Model Chi-Square. The recommendations regarding an acceptable ratio for this statistic range from as high as 5.0 to as low as 2.0 (Hooper et al, 2008).

#### **4.14.3 Root Mean Square Error of Approximation (RMSEA)**

Representing how well the fitted model approximates per degree of freedom are also frequently applied with their large values indicating high residual variance that reflects a poorly fitting model (Hooper et al, 2008). In recent years it has become regarded as one of the most informative fit indices due to its sensitivity to the number of estimated parameters in the model. In other words, the RMSEA favours parsimony in that it will choose the model with the lesser number of parameters.

Recommendations for RMSEA cut-off points have been reduced considerably in the last fifteen years. until the early nineties, an RMSEA in the range of 0.05 to 0.10 was considered an indication of fair fit and values above 0.10 indicated poor fit, and then it was thought that an RMSEA of between 0.08 to 0.10 provides average fit and below 0.08 shows a good fit (MacCallum et al, 1996, cited in Hooper et al, 2008). However, more recently, a cut-off value close to .06 (Hu and Bentler, 1999) or a stringent upper limit of 0.07 (Steiger, 2007) seems to be the general consensus amongst authorities in this area (Hooper et al, 2008). Finally it is generally reported in conjunction with the RMSEA and in a well-fitting model the lower limit is close to 0 while the upper limit should be less than 0.08.

#### ***4.14.4 Goodness-of-fit statistic (GFI) and the adjusted goodness-of-fit statistic (AGFI)***

fall into two classes: absolute and incremental fit indices. Absolute fit indices directly measure how well the observed data fit with the model specification ,while incremental fit indices assess how well the model specification fits compared to a null or baseline model. According to Hooper et al, (2008) the (GFI) was created as an alternative to the Chi-Square test and calculates the proportion of variance that is accounted for by the estimated population covariance, this statistic ranges from 0 to 1 and with larger samples increasing its value and the cut-off point of 0.90 has been recommended for the GFI however, simulation studies have shown that when factor loadings and sample sizes are low a higher cut-off of 0.95 is more appropriate. On the other hand the value of AGFI which adjusts the GFI based upon degrees of freedom also ranges between 0 and 1 and it is generally accepted that values of 0.90 or greater indicate well-fitting models.

#### ***4.14.5 Root mean square residual (RMR) and standardized root mean square residual (SRMR)***

The RMR and the SRMR are the square root of the difference between the residuals of the sample covariance matrix and the hypothesized covariance model. Values for the SRMR range from zero to 1.0 with well-fitting models obtaining values less than .05, however values as high as 0.08 are deemed acceptable (Hooper et al, 2008). An SRMR of 0 indicates perfect fit but it must be noted that SRMR will be lower when there is a high number of parameters in the model and in models based on large sample sizes (Hooper et al, 2008).

#### **4.14.6 Incremental fit indices**

Incremental fit indices are a group of indices that do not use the chi-square in its raw form but compare the chi-square value to a baseline model this means it use to measure how well the model fits in comparison to no model at all. This category includes Normed-fit index (NFI), Non-Normed Fit Index (NNFI) and Comparative fit index (CFI) (Hooper et al, 2008). The following sub sections will discuss these indices.

#### ***4.14.7 Normed-fit index (NFI)***

This statistic assesses the model by comparing the  $\chi^2$  value of the model to the  $\chi^2$  of the null model. Values for this statistic range between 0 and 1 referring to Bentler and Bonnet (1980) recommending values greater than 0.90 indicating a good fit. More recent suggestions state that the cut-off criteria should be  $NFI \geq .95$  (Hu and Bentler, 1999).

#### ***4.14.8 Non-Normed Fit Index (NNFI)***

Non-Normed Fit Index (NNFI), also known as the Tucker-Lewis index (TLI), is an index that prefers simpler models. Recommendations as low as 0.80 as a cutoff have been preferred however Bentler and Hu (1999) have suggested NNFI  $\geq 0.95$  as the threshold.

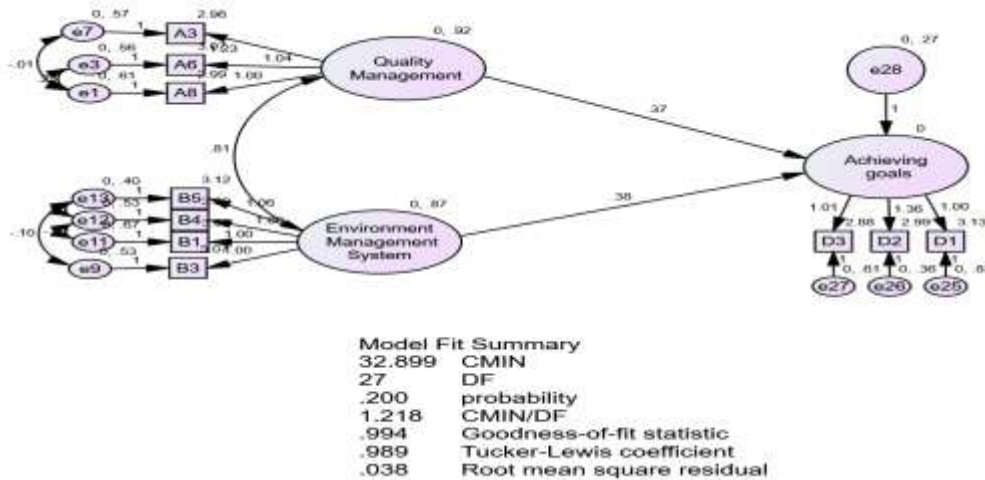
#### ***4.14.9 Comparative fit index (CFI)***

This statistic assumes that all latent variables are uncorrelated (null/independence model) and compares the sample covariance matrix with this null model. The values for this statistic range between 0.0 and 1.0 with values closer to 1.0 indicating good fit. A cut-off criterion of CFI  $\geq 0.90$  was initially advanced however, recent studies have shown that a value greater than 0.90 is needed in order to ensure that miss-specified models are not accepted (Hu & Bentler, 1999). From this, a value of CFI  $\geq 0.95$  is presently recognized as indicative of good fit (Hu & Bentler, 1999). Today this index is included in all SEM programs and is one of the most popularly reported fit indices due to being one of the measures least affected by sample size (Fan, Thompson, & Wang, 1999).

#### **4.14.10 The relationship between the Integrated Management System (IMS) and the Business results dimensions.**

This section aims to investigate the effect of the Integrated Management System ON the Business results (Achieving goals) shown in Figure (5.9) below.

H1.1.Integrated Management System (IMS) has a positive effect on Business results (Achieving goals)



**Figure (4.7) The relationship between the Integrated Management System (IMS) and the Business results dimensions.**

From the above figure some hypotheses were developed to be tested. In order to test these hypotheses, path analysis in (SEM) using AMOS to test the impacts of Integrated Management System (IMS) on Business results (Achieving goals) . The results of path analyses showing Model fit parameters consistent with recommendation for  $CMIN/DF < 2$ ,  $0 < RMSEA < 1$ ,  $0 < GFI < 1$ ,  $0 < AGFI < 1$ ,  $0 < RMR < 1$ ,  $0 < NFI < 1$ ,  $0 < CFI < 1$ , and  $PCLOSE > 0.05$ . The full AMOS output (Regression Weights) is displayed in table (5.22)>

**Table (4.19) the relationship between Integrated Management System ON the Business results (Achieving goals)**

			Estimate	S.E.	C.R.	P
Quality Management	--->	Achieving goals	.371	.233	1.593	.111
Environment Management System	--->	Achieving goals	.381	.233	1.636	.102

The table showed that the two dimensions of the SUB- hypotheses Integrated Management System (Quality Management, and Environment Management System) with the Achieving goals not supported. These findings signify indicates that Integrated Management System (Quality Management, and Environment Management System) have not positive relationship with Achieving goals. Thus, over all hypotheses are not supported

#### 4.14.11 The relationship between the Integrated Management System (IMS) and the Business results dimensions .

This section aims to investigate the effect of the Integrated Management System ON the Business results (Customer's satisfaction) shown in Figure (5.9) below.

H1.1. Integrated Management System (IMS) has a positive effect on Business results (Customer's satisfaction)

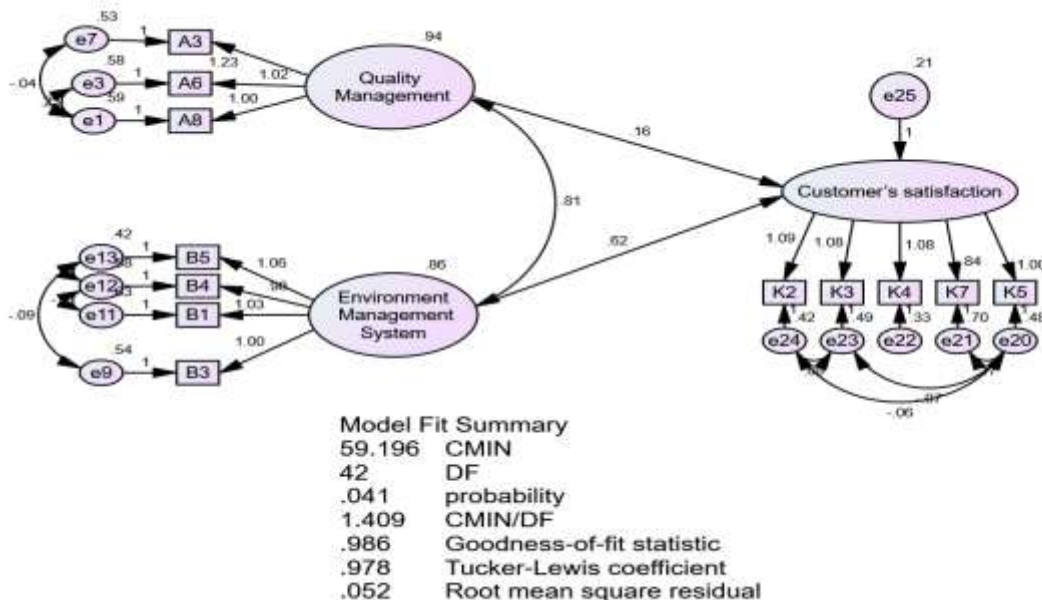


Figure (4.8) The relationship between the Integrated Management System (IMS) and the Business results dimensions .



From the above figure some hypotheses were developed to be tested. In order to test these hypotheses, path analysis in (SEM) using AMOS to test the impacts of Integrated Management System (IMS) on Business results (Customer's satisfaction). The results of path analyses showing Model fit parameters consistent with recommendation for  $CMIN/DF < 2$ ,  $0 < RMSEA < 1$ ,  $0 < GFI < 1$ ,  $0 < AGFI < 1$ ,  $0 < RMR < 1$ ,  $0 < NFI < 1$ ,  $0 < CFI < 1$ , and  $PCLOSE > 0.05$ . The full AMOS output (Regression Weights) is displayed in table (5.22)>

**Table (4.20) the relationship between Integrated Management System ON the Business results (Customer's satisfaction)**

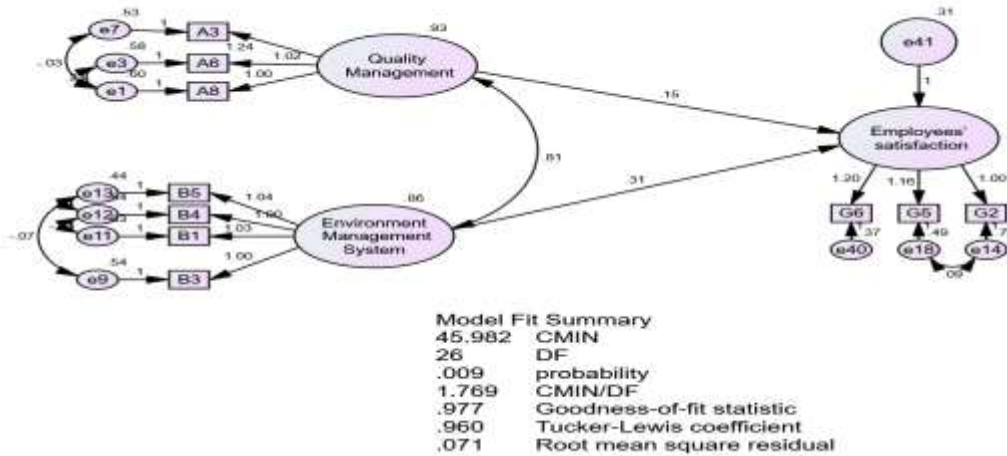
			Estimate	S.E.	C.R.	P
Quality Management	--->	Customer's satisfaction	.163	.209	.782	.434
Environment Management System	--->	Customer's satisfaction	.625	.226	2.770	.006

Table (4.20) summarizes the Findings of testing hypotheses concerning the relationships between Integrated Management System ON the Business results (Customer's satisfaction). The table showed that one of the SUB- hypotheses fully supported (Environment Management System) with Business results (Customer's satisfaction) and the second SUB- hypotheses were NOT supported. These findings signify that Integrated Management System show partially supported on the relationship of Integrated Management System ON Business results (Customer's satisfaction). Thus, over hypotheses are partially supported.

#### **4.14.12 The relationship between the Integrated Management System (IMS) and the Business results dimensions.**

This section aims to investigate the effect of the Integrated Management System ON the Business results (Employees' satisfaction) shown in Figure (5.9) below.

H1.1.Integrated Management System (IMS) has a positive effect on Business results (Employees’ satisfaction)



**Figure (4.9) The relationship between the Integrated Management System (IMS) and the Business results dimensions.**

From the above figure some hypotheses were developed to be tested. In order to test these hypotheses, path analysis in (SEM) using AMOS to test the impacts of Integrated Management System (IMS) on Business results (Employees’ satisfaction) . The results of path analyses showing Model fit parameters consistent with recommendation for  $CMIN/DF < 2$ ,  $0 < RMSEA < 1$ ,  $0 < GFI < 1$ ,  $0 < AGFI < 1$ ,  $0 < RMR < 1$ ,  $0 < NFI < 1$ ,  $0 < CFI < 1$ , and  $PCLOSE > 0.05$ . The full AMOS output (Regression Weights) is displayed in table (5.22)

**Table (4.21) the relationship between Integrated Management System ON the Business results (Employees’ satisfaction)**

			Estimate	S.E.	C.R.	P
Quality Management	--->	Employees’ satisfaction	.147	.223	.659	.510
Environment Management System	--->	Employees’ satisfaction	.310	.233	1.333	.183

The table showed that the two dimensions of the SUB- hypotheses Integrated Management System (Quality Management, and Environment Management System) with the Employees' satisfaction not supported. These findings signify indicates that Integrated Management System (Quality Management, and Environment Management System) have not positive relationship with Employees' satisfaction. Thus, over all hypotheses are not fully supported.

#### 4.14.13 The relationship between the Integrated Management System (IMS) and the Human Capital Efficiency.

This section aims to investigate the effect of the Integrated Management System ON the Human Capital Efficiency shown in Figure (5.9) below.

H1.1. Integrated Management System (IMS) has a positive effect on Human Capital Efficiency

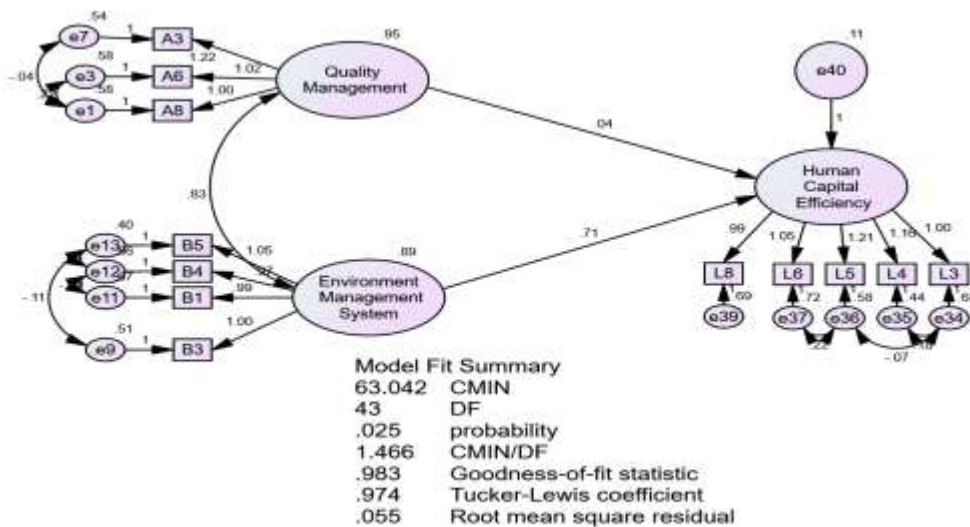


Figure (4.10) The relationship between the Integrated Management System (IMS) and the Human Capital Efficiency.

From the above figure some hypotheses were developed to be tested. In order to test these hypotheses, path analysis in (SEM) using AMOS to test the impacts of Integrated Management System (IMS) on Human Capital Efficiency. The results of path analyses showing Model fit parameters consistent with recommendation for  $CMIN/DF < 2, 0 < RMSEA < 1, 0 < GFI < 1, 0 < AGFI < 1, 0 < RMR < 1, 0 < NFI < 1, 0 < CFI < 1$ , and  $PCLOSE > 0.05$ . The full AMOS output (Regression Weights) is displayed in table (5.22)>

**Table (4.22) the relationship between Integrated Management System ON the Human Capital Efficiency**

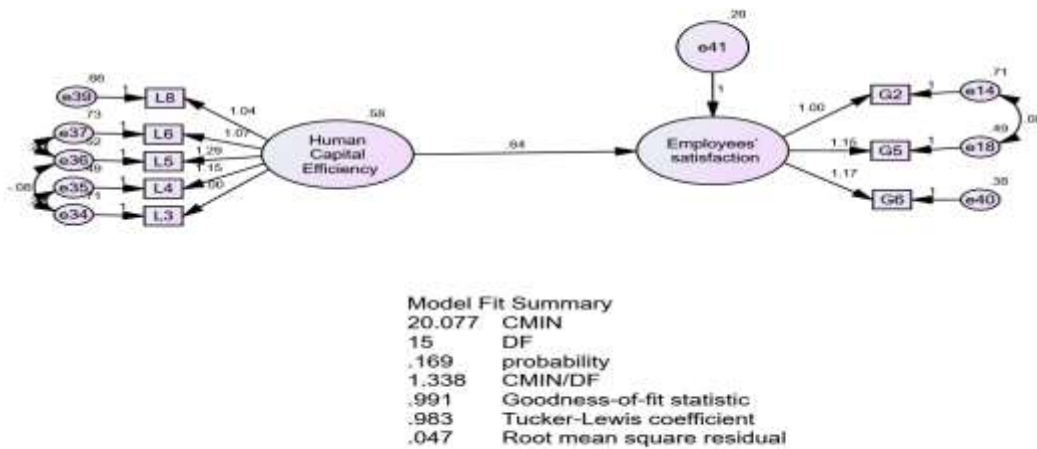
			Estimate	S.E.	C.R.	P
Quality Management	--->	Human Capital Efficiency	.044	.184	.238	.812
Environment Management System	--->	Human Capital Efficiency	.709	.206	3.446	***

Table (5.21) summarizes the Findings of testing hypotheses concerning the relationships between Integrated Management System ON the Human Capital Efficiency. The table showed that one of the SUB- hypotheses fully supported (Environment Management System) with Human Capital Efficiency, and the second SUB- hypotheses were NOT supported. These findings signify that Integrated Management System show partially supported on the relationship of Integrated Management System ON Human Capital Efficiency, Thus, over hypotheses are partially supported.

#### 4.14.14 The relationship between the Human Capital Efficiency and the Business results (Employees' satisfaction).

This section aims to investigate the effect of the Human Capital Efficiency ON the (Employees' satisfaction shown in Figure (5.9) below.

H1.1. Human Capital Efficiency has a positive effect ON the (Employees' satisfaction



**Figure (4.11)The relationship between the Human Capital Efficiency and the Business results (Employees' satisfaction).**

From the above figure some hypotheses were developed to be tested. In order to test these hypotheses, path analysis in (SEM) using AMOS to test the impacts of Human Capital Efficiency on Business results (Employees' satisfaction). The results of path analyses showing Model fit parameters consistent with recommendation for  $CMIN/DF < 2$ ,  $0 < RMSEA < 1$ ,  $0 < GFI < 1$ ,  $0 < AGFI < 1$ ,  $0 < RMR < 1$ ,  $0 < NFI < 1$ ,  $0 < CFI < 1$ , and  $PCLOSE > 0.05$ . The full AMOS output (Regression Weights) is displayed in table (5.22)>

**Table (4.23) the relationship between Human Capital Efficiency ON the Business results (Employees' satisfaction).**

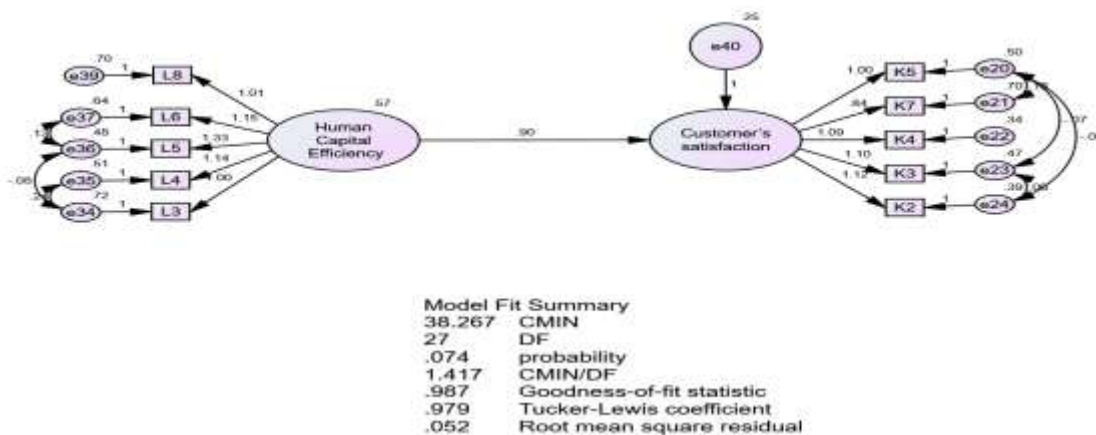
			Estimate	S.E.	C.R.	P
Human Capital Efficiency	--->	Employees' satisfaction	.638	.125	5.101	***

Table (4.23) summarizes the Findings of testing hypothesis concerning the relationships between Human Capital Efficiency ON the Business results (Employees' satisfaction). The table showed that of the main hypothesis fully supported, thus, over hypotheses are fully supported.

**4.14.15 The relationship between the Human Capital Efficiency and the Business results (Customer's satisfaction).**

This section aims to investigate the effect of the Integrated Management System ON the Human Capital Efficiency shown in Figure (5.9) below.

H1.1.Human Capital Efficiency has a positive effect on Business results (Customer's satisfaction)



**Figure (4.12) The relationship between the Human Capital Efficiency and the Business results (Customer's satisfaction).**

From the above figure some hypotheses were developed to be tested. In order to test these hypotheses, path analysis in (SEM) using AMOS to test the impacts of Human Capital Efficiency on Business results (Customer's satisfaction). The results of path analyses showing Model fit parameters consistent with recommendation for  $CMIN/DF < 2$ ,  $0 < RMSEA < 1$ ,  $0 < GFI < 1$ ,  $0 < AGFI < 1$ ,  $0 < RMR < 1$ ,  $0 < NFI < 1$ ,  $0 < CFI < 1$ , and  $PCLOSE > 0.05$ . The full AMOS output (Regression Weights) is displayed in table (5.22)>

**Table (4.24) the relationship between Human Capital Efficiency ON the Business results (Customer's satisfaction).**

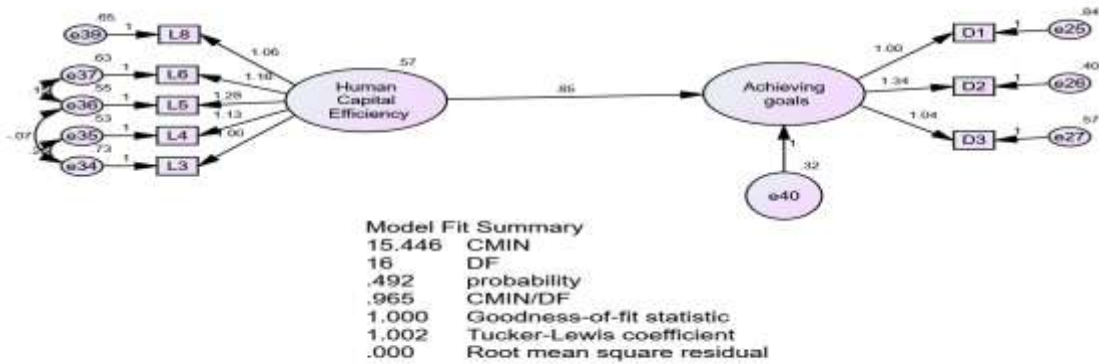
			Estimate	S.E.	C.R.	P
Human Capital Efficiency	--->	Customer's satisfaction	.902	.134	6.709	***

Table (4.24) summarizes the Findings of testing hypothesis concerning the relationships between Human Capital Efficiency ON the Business results (Customer's satisfaction). The table showed that of the main hypothesis fully supported, thus, over hypotheses are fully supported.

**4.14.16 The relationship between the Human Capital Efficiency and the Business results (Achieving goals).**

This section aims to investigate the effect of the Integrated Management System ON the Human Capital Efficiency shown in Figure (5.9) below.

H1.1. Human Capital Efficiency has a positive effect on Business results (Achieving goals)



**Figure (4.13) The relationship between the Human Capital Efficiency and the Business results (Achieving goals).**

From the above figure some hypotheses were developed to be tested. In order to test these hypotheses, path analysis in (SEM) using AMOS to test the impacts of Human Capital Efficiency on Business results (Achieving goals). The results of path analyses showing Model fit parameters consistent with recommendation for  $CMIN/DF < 2$ ,  $0 < RMSEA < 1$ ,  $0 < GFI < 1$ ,  $0 < AGFI < 1$ ,  $0 < RMR < 1$ ,  $0 < NFI < 1$ ,  $0 < CFI < 1$ , and  $PCLOSE > 0.05$ . The full AMOS output (Regression Weights) is displayed in table (5.22)>

**Table (4.25) the relationship between Human Capital Efficiency ON the Business results (Achieving goals).**

			Estimate	S.E.	C.R.	P
Human Capital Efficiency	--->	Achieving goals	.851	.145	5.870	***

Table (5.21) summarizes the Findings of testing hypothesis concerning the relationships between Human Capital Efficiency ON the Business results



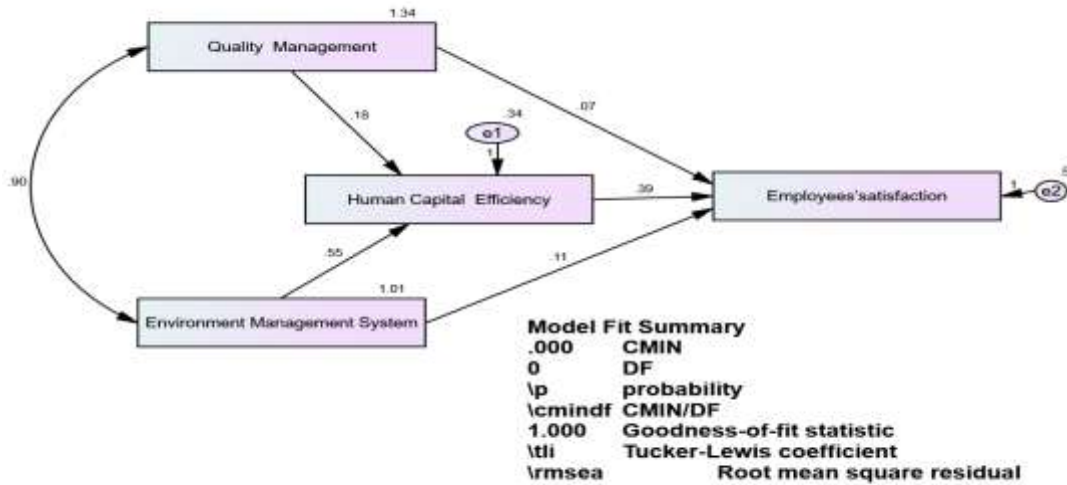
(Achieving goals). The table showed that of the main hypothesis fully supported, thus, over hypotheses are fully supported

#### **4-15: The Mediating Effect OF Human Capital Efficiency.**

Testing mediation impact aims to detect the intervening variable in the model through the differences in coefficients using an examination method. On the other hand, in order to found whether mediator is fully or partially mediating the relationship between the independent variable and dependent variable, the impact of independent variable on dependent variable controlling for mediating variable should be zero or  $\beta_4$  is not significant in fully mediator, while partial mediator exists once  $\beta_4$  is significant but reduced. Despite the method outlined by (e.g., Baron & Kenny, 1986; Kenny et al., 1998) is the most commonly used approach in the literature (Frazier, Tix, and Barron, 2004) however, to fulfill the condition for testing the mediation effect of Human Capital Efficiency in this study the direct and indirect effect was conducted to examine firstly, the direct effect between Integrated Management System and the Business results (Employees' satisfaction).then the indirect effect to this relation through the Human Capital Efficiency .

Given that the third assumption of Kenny approach was not satisfied in this study, in which the (independent variable) variable must significantly influence on the dependent variable ( $\beta_3$  must be significant), this means that the relationship between the Integrated Management System and the Business results (Employees' satisfaction) significant. The results of the direct and indirect effect analyses were discussed in the next subsections. Figure

**(5.15) H7.1.1 Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results (Employees' satisfaction)**



**Figure (4.14) The Mediating Effect OF Human Capital Efficiency**

Concerning the model fit recommendation AMOS output showing Model fit indices as follow, CMIN/DF=0.000, RMSEA=.000, GFI=1.00, AGFI=1.000, RMR=.000, NFI=1.000, CFI=1, and PCLOSE=0.000. Figure (5.32) below presents the model fit measures and their interpretations. The test result of path coefficient and hypotheses for the impact of mediation variable in Table 2 shows that the impact of Integrated Management System on the Business results (Employees' satisfaction) through Human Capital Efficiency.

Table (5.32) presented the results of the testing the mediating effect of Human Capital Efficiency on the relationship between Integrated Management System and the Business results (Employees' satisfaction).

The results indicate that Human Capital Efficiency as mediating partially Supported influenced the relationship between (Quality Management and Environment Management System) and Business results (Employees' satisfaction), thus, it can be interpreted that Human Capital Efficiency partially mediated the relationship between Integrated Management System and the Business results (Employees' satisfaction). . The full AMOS is presented in Appendix.

**Table (4.26) Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results (Employees' satisfaction)**

	Direct	indirect	Empirical Evidence
Quality Management--> Human Capital Efficiency--> Employees' satisfaction	.090**	.090**	<b>partially Supported</b>
Environment Management System --> Human Capital Efficiency--> Employees' satisfaction	.239**	.239**	<b>partially Supported</b>

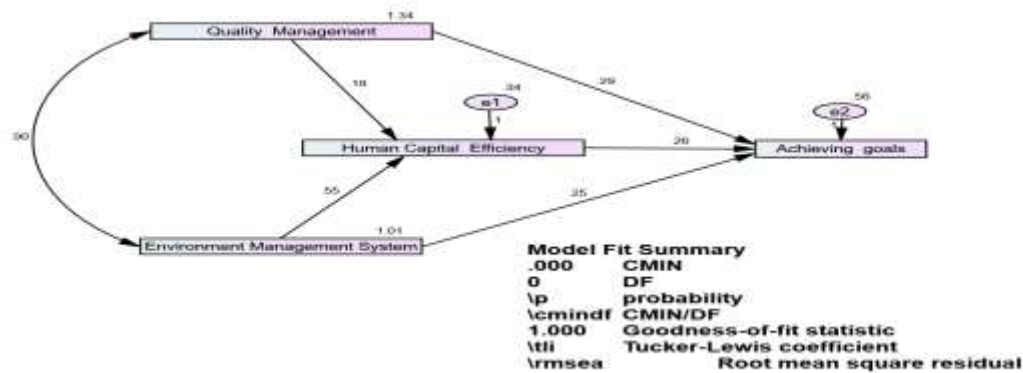
**4-15: The Mediating Effect OF Human Capital Efficiency.**

Testing mediation impact aims to detect the intervening variable in the model through the differences in coefficients using an examination method. On the other hand, in order to found whether mediator is fully or partially mediating the relationship between the independent variable and dependent variable, the impact of independent variable on dependent variable controlling for mediating variable should be zero or  $\beta_4$  is not significant in fully mediator, while partial mediator

exists once  $\beta_4$  is significant but reduced. Despite the method outlined by (e.g., Baron & Kenny, 1986; Kenny et al., 1998) is the most commonly used approach in the literature (Frazier, Tix, and Barron, 2004) however, to fulfill the condition for testing the mediation effect of Human Capital Efficiency in this study the direct and indirect effect was conducted to examine firstly, the direct effect between Integrated Management System and the Business results (Customer's satisfaction).then the indirect effect to this relation through the Human Capital Efficiency .

Given that the third assumption of Kenny approach was not satisfied in this study, in which the (independent variable) variable must significantly influence on the dependent variable ( $\beta_3$  must be significant), this means that the relationship between the Integrated Management System and the Business results (Customer's satisfaction) significant. The results of the direct and indirect effect analyses were discussed in the next subsections. Figure

**(5.15) H7.1.1 Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results (Customer's satisfaction)**



**Figure (4.15) The Mediating Effect OF Human Capital Efficiency**

Concerning the model fit recommendation AMOS output showing Model fit indices as follow, CMIN/DF=0.000, RMSEA=.000, GFI=1.00, AGFI=1.000, RMR=.000, NFI=1.000, CFI=1, and PCLOSE=0.000. Figure (5.32) below presents the model fit measures and their interpretations. The test result of path coefficient and hypotheses for the impact of mediation variable in Table 2 shows that the impact of Integrated Management System on the Business results (Achieving goals) through Human Capital Efficiency.

Table (5.32) presented the results of the testing the mediating effect of Human Capital Efficiency on the relationship between Integrated Management System and the Business results (Achieving goals).

The results indicate that Human Capital Efficiency as mediating partially Supported influenced the relationship between (Quality Management and Environment Management System)and Business results (Achieving goals). , thus, it can be interpreted that Human Capital Efficiency partially mediated the relationship between Integrated Management System and the Business results (Achieving goals). . The full AMOS is presented in Appendix.

**Table (4.27) Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results (Achieving goals)**

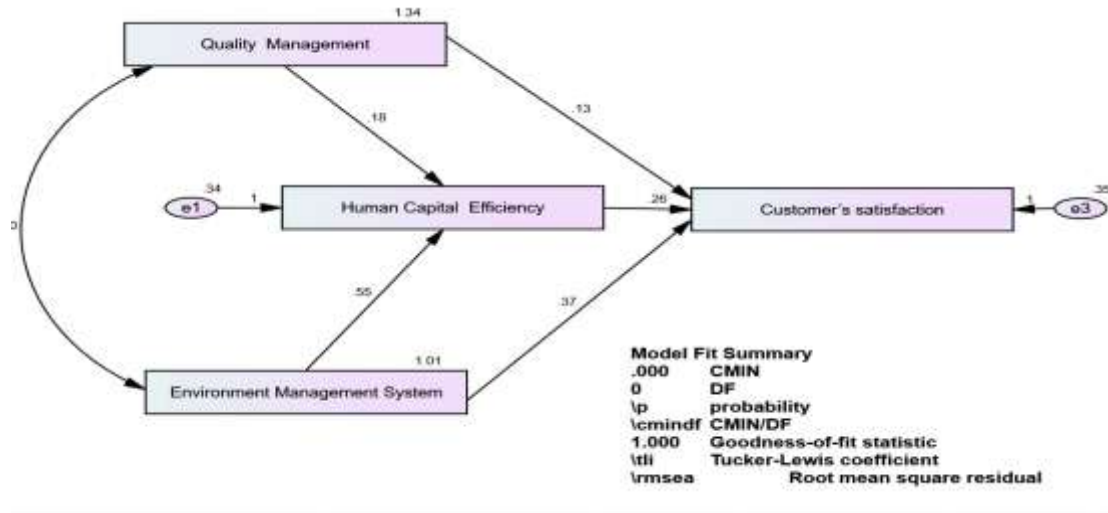
	Direct	indirect	Empirical Evidence
Quality Management--> Human Capital Efficiency--> Achieving goals	.090**	.051*	<b>partially Supported</b>
Environment Management System --> Human Capital Efficiency--> Achieving goals	.239**	.135*	<b>partially Supported</b>

#### **4-15: The Mediating Effect OF Human Capital Efficiency.**

Testing mediation impact aims to detect the intervening variable in the model through the differences in coefficients using an examination method. On the other hand, in order to found whether mediator is fully or partially mediating the relationship between the independent variable and dependent variable, the impact of independent variable on dependent variable controlling for mediating variable should be zero or  $\beta_4$  is not significant in fully mediator, while partial mediator exists once  $\beta_4$  is significant but reduced. Despite the method outlined by (e.g., Baron & Kenny, 1986; Kenny et al., 1998) is the most commonly used approach in the literature (Frazier, Tix, and Barron, 2004) however, to fulfill the condition for testing the mediation effect of Human Capital Efficiency in this study the direct and indirect effect was conducted to examine firstly, the direct effect between Integrated Management System and the Business results (Customer's satisfaction ).then the indirect effect to this relation through the Human Capital Efficiency .

Given that the third assumption of Kenny approach was not satisfied in this study, in which the (independent variable) variable must significantly influence on the dependent variable ( $\beta_3$  must be significant), this means that the relationship between the Integrated Management System and the Business results (Customer's satisfaction ) significant. The results of the direct and indirect effect analyses were discussed in the next subsections. Figure

**(5.15) H7.1.1 Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results (Customer's satisfaction)**



**Figure (4.16) The Mediating Effect OF Human Capital Efficiency**

Concerning the model fit recommendation AMOS output showing Model fit indices as follow, CMIN/DF=0.000, RMSEA=.000, GFI=1.00, AGFI=1.000, RMR=.000, NFI=1.000, CFI=1, and PCLOSE=0.000. Figure (5.32) below presents the model fit measures and their interpretations. The test result of path coefficient and hypotheses for the impact of mediation variable in Table 2 shows that the impact of Integrated Management System on the Business results (Customer's satisfaction) through Human Capital Efficiency.

Table (5.32) presented the results of the testing the mediating effect of Human Capital Efficiency on the relationship between Integrated Management System and the Business results (Customer's satisfaction).

The results indicate that Human Capital Efficiency as mediating partially Supported influenced the relationship between (Quality Management and

Environment Management System) and Business results (Customer's satisfaction). , thus, it can be interpreted that Human Capital Efficiency partially mediated the relationship between Integrated Management System and the Business results (Customer's satisfaction). The full AMOS is presented in Appendix.

**Table (4.28) Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results (Customer's satisfaction )**

	Direct	indirect	Empirical Evidence
Quality Management--> Human Capital efficiency--> Customer's satisfaction	.167**	.059**	<b>Full Supported</b>
Environment Management System --> Human Capital Efficiency--> Customer's satisfaction	.404**	.157**	<b>Full Supported</b>

**Table (4.29) Summary of Hypotheses Testing Results for the Relationship between**

Item	Statement of Hypothesis: There is a positive relationship between,	Remark
H1	<b>Integrated Management System (IMS) has a positive effect on Business results</b>	<b>partially Supported</b>
H1.1	Integrated Management System (IMS) has a positive effect on Business results (Achieving goals)	Not Supported
H1.1a	Quality Management System has a positive	Not



		effect on Business results (Achieving goals)	Supported
	<b>H.1.1b</b>	Environment Management System has a positive effect on Business results (Achieving goals)	Not Supported
	<b>H.1.2</b>	Integrated Management System (IMS) has a positive effect on Business results (Employees' satisfaction)	Not Supported
	<b>H.1.2a</b>	Quality Management System has a positive effect on Business results (Employees' satisfaction)	Not Supported
	<b>H.1.2b</b>	Environment Management System has a positive effect on Business results (Employees' satisfaction)	Not Supported
	<b>H.1.3</b>	Integrated Management System (IMS) has a positive effect on Business results Customer's satisfaction	partially Supported
	<b>H.1.3a</b>	Quality Management System has a positive effect on Business results Customer's satisfaction)	Not Supported
	<b>H.1.3b</b>	Environment Management System has a positive effect on Business results (Customer's satisfaction)	Supported
<b>H2</b>	<b>Integrated Management System (IMS) has a positive effect on Human Capital Efficiency</b>		partially Supported
	<b>H.2.1</b>	Quality Management System has a positive effect on Human Capital Efficiency	Full Supported
	<b>H.2.2</b>	Environment Management System has a positive effect on Human Capital Efficiency	Not Supported
<b>H3</b>	<b>Human Capital Efficiency has a positive effect on Business results</b>		Full Supported
	<b>H.3.1</b>	Human Capital Efficiency has a positive effect on Business	Full

		results (Achieving goals)	Supported
	<b>H.3.2</b>	Human Capital Efficiency has a positive effect on Business results (Employees' satisfaction)	Full Supported
	<b>H.3.3</b>	Human Capital Efficiency has a positive effect on Business results (Customer's satisfaction)	Full Supported
H4	<b>Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results</b>		partially Supported
	<b>H.4.1</b>	Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results (Achieving goals)	partially Supported
	<b>H.4.1a</b>	Human Capital Efficiency mediates the relationship between quality Management System and the Business results (Achieving goals)	partially Supported
	<b>H.4.1b</b>	Human Capital Efficiency mediates the relationship between Environment Management System and the Business results (Achieving goals)	partially Supported
	<b>H.4.2</b>	Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results ((Customer's satisfaction)	Full Supported
	<b>H.4.2a</b>	Human Capital Efficiency mediates the relationship between Quality Management System and the Business results (Customer's satisfaction)	Full Supported
	<b>H.4.2b</b>	Human Capital Efficiency mediates the relationship between Environment Management System and the Business results (Customer's satisfaction)	Full Supported
	<b>H.4.3</b>	Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results(Employees' satisfaction)	partially Supported
	<b>H.4.3a</b>	Human Capital Efficiency mediates the relationship between Quality Management System and the Business results(Employees' satisfaction)	partially Supported
	<b>H.4.3b</b>	Human Capital Efficiency mediates the relationship between Environment Management System and the Business results(Employees' satisfaction)	partially Supported

## **The Finding:**

- Integrated Management System (IMS) has a positive effect on Business results (Achieving goals)
- Quality Management System has no positive effect on achieving goals.
- Environment Management System has no positive effect on achieving goals.
- Integrated Management System (IMS) has no positive effect on Business results (Employees' satisfaction)
- Quality Management System has no positive effect on employees' satisfaction.
- Environment Management System has no positive effect on employees' satisfaction.
- Integrated Management System (IMS) has a partial effect on Business results Customer's satisfaction
- Quality Management System has no positive effect on Customer's satisfaction.
- Environment Management System has a positive effect on Customer's satisfaction.
- Integrated Management System (IMS) has a partial effect on Human Capital Efficiency
- Quality Management System has a Full positive effect on Human Capital Efficiency

- Environment Management System has no positive effect on Human Capital Efficiency
- Human Capital Efficiency has a full effect on Business results
- Human Capital Efficiency has full positive effect on achieving goals.
- Human Capital Efficiency has a full positive effect on employees' satisfaction.
- Human Capital Efficiency has full positive effect on customer's satisfaction.
- Human Capital Efficiency partially mediates the relationship between Integrated Management System and the Business results
- Human Capital Efficiency partially mediates the relationship between Integrated Management System and the achieving goals.
- Human Capital Efficiency partially mediates the relationship between quality Management System and achieving goals.
- Human Capital Efficiency partially mediates the relationship between Environment Management System and the achieving goals.
- Human Capital Efficiency full mediates the relationship between Integrated Management System and the customer's satisfaction.
- Human Capital Efficiency full mediates the relationship between Quality Management System and customer's satisfaction.
- Human Capital Efficiency full mediates the relationship between Environment Management System and customer's satisfaction.

- Human Capital Efficiency partially mediates the relationship between Integrated Management System and employees' satisfaction.
- Human Capital Efficiency partially mediates the relationship between Quality Management System and employees' satisfaction.
- Human Capital Efficiency partially mediates the relationship between Environment Management System and employees' satisfaction.

### **Summary of the Chapter**

Chapter presents the empirical analysis and results of the analysis. The empirical analysis was to examine the causal structure representing the research hypotheses of this study. The causal structure was examined with SEM (Structural Equation Modeling) which primarily comprises a measurement model and a structural model. Before conducting the measurement and structural models, SEM Path Analysis to test the research hypotheses. The next chapter reviews the findings and discusses the results and their implications as well as limitations, future research and conclusions of the study.

## **Chapter five**

### **Discussion**

#### **5.0. Overview**

This chapter produces the research findings are illustrated initially followed by discussion of the results in light of previous studies. The implications of the findings of theory and management are then developed. Finally, limitations and directions for future research. The mainly objective of this study is to examine the relationships between Integrated Management Systems ((ISO 9001, ISO 14001, OSHAS18001) and Business Results, and the mediating role of effecting of human capital efficiency.

And to achieve these, it was necessary first to hypothesis theses causal relationships and second to empirically examine the relationships. The research model of this thesis was developed both from the literature review and previous studies. Methodological issues were also addressed for the examination of the relationship in the conceptual model the data was collected from purposive sample by cross-sectional survey from (5) Sudanese Electricity companies. The research model and hypotheses were tested with Structural Equation Modeling (SEM).

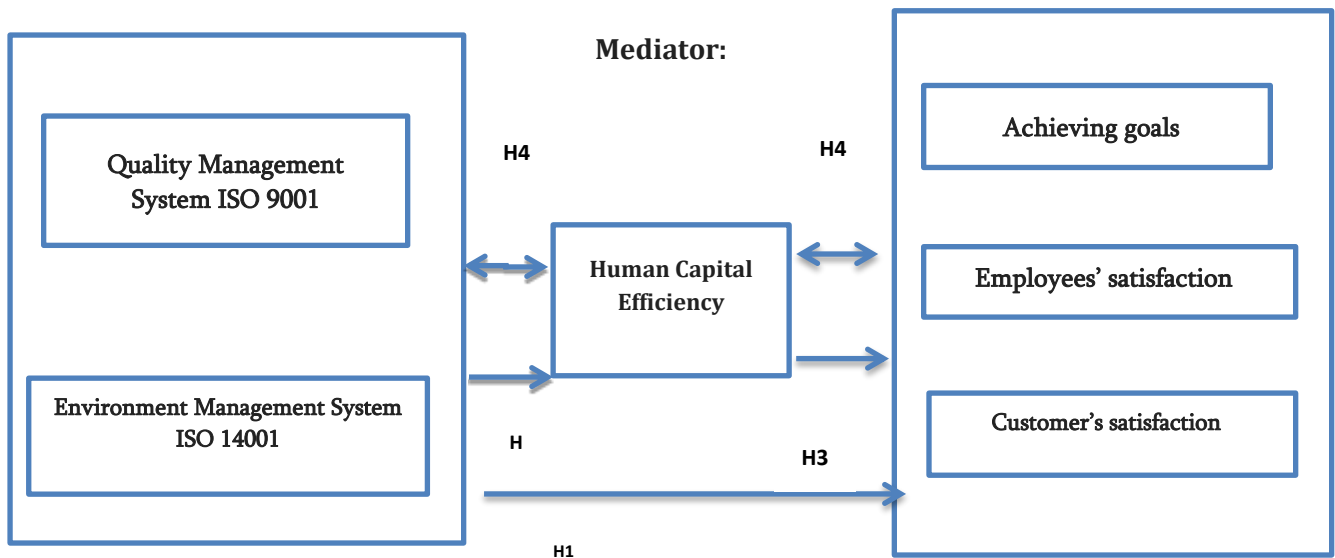
#### **5.1. Modified Study Model:**

First, the independent variable (IV) Integrated Management System (IMS) encompasses three diminutions (Quality Management System ISO 9001, Environment Management System ISO 14001, and Occupational safety & health management system OHSAS 18001). Based on Confirmatory Factor Analysis (CFA). Occupational safety & health management system OHSAS 18001 was excluded from the (DV) dependent variable because it was not suitable and appropriate for the environment in where the study was conducted did not reach the level of significance at (0.05) less, dependent variable (DV) business results

remain as they were included (achieving goals, employee satisfaction, and customer satisfaction). Mediator variable Human Capital Efficiency mediates the relationship between Integrated Management System and Business results structured a new model as in the figure below.

**IV: Integrated Management System (IMS)**

**DV: Business results**



**Figure (1.5) Modified Study Model**

**5.2. Availability of Integrated Management System Elements in the Sudanese electricity sector:**

The results of descriptive statistical analysis showed that the trends of the study sample were positive, also it resulted that the study focus more on environmental management system compared with quality management system. The availability level of core elements of the application of quality management in Sudanese Electricity sector respectively were: processes, corrective and preventive actions, workplace, documentation, leadership commitment, quality culture, and the availability level of adopting environmental management system elements

respectively were: awareness, legal and legislation requirements, continuous improvement, Policy. The standard deviation and mean resulted that Integrated Management System dimensions achieving more highest average than business results that mean the surveyors under study give less interest to business results than usual in Sudanese Electricity sector. Also results showed that business results dimensions a achieving goals highest average, followed by the employee's satisfaction, followed by the customers satisfaction., survey respondents focus more on achieving goals phrases came in importance respectively: Vision, increased efficiency, Reduce wasted hours and resources, decreased pollution rate. Employee's Satisfaction in second place of importance includes: reduced complaints, increase customers' loyalty and fulfills customers' needs. Finally, customer satisfaction. Includes: enhances communication, develop employees' abilities and employees' motivation. The mean and standard deviation of human capital efficiency is lower, indicating weakness the of Mediator variable, the surveyors under study give less attention than usual, the ranking is respectively in importance: skill, experience, competence, respond quickly to change.



### **5.3. Discussion**

This section is focused on the discussion of the findings. The discussion is mainly based on previous works empirical evidence and conceptual studies that are considered to be appropriate for this study. The discussion included the relationships between Integrated Management System (IMS), Business Results, and mediating role of Human Capital Efficiency.

#### **5.3.1 The relationship between Integrated Management System (IMS), Business results:**

This stud mainly aimed to investigate the effect of Integrated Management System (Quality Management and Environment Management System) on business results which Includes (Achieving goals, Customer's satisfaction and Employees' satisfaction) as first main objective.

5.3.1.1 The relationship between Integrated Management System (IMS), Business results (Achieving goals). The result showed that Integrated Management System (Quality Management, and Environment Management System) has a positive effect on Business results (Achieving goals).This result supported by evidence from previous studies, Where have shown (Jorge.et.al, 2012) QMS& EMS practices have positive effects on financial performance and market success and reduce the time and costs and reducing their ecological impact. (Yang Sui.et.al, 2018) improving the management efficiency (Zutshi, Ambika and Sohal, Amrik S. 2005) saving of dollars, Better utilization of resources, improved communication across the organization,. (Arne Remen. et.al, 2005) integration as a strategic and inherent approach is a solution to problems related to achieving 'real' continuous improvement such as improved competitive advantages and contributing to sustainable development. (Ahmad Ezzat.et al, 2017) Improve the overall management system efficiency, create sustainable competitive.,(Mohammad Asrul Mustapha.et.al, 2016) IMS framework towards sustainability goals, cost and time

savings via avoidance of redundancies, while simultaneously enhancing productivity, reduce the time for document preparations, manpower for document controller, cost for internal and external audits, as well as encouraging facility managers to implement action plans for cleaner production, IMS framework that utilizes a unified GI that simultaneously cover aspects of energy, water and materials conservation, as well as reduction of environmental emissions. (Alexandra Simon and Luc Honore Petnji Yaya, 2012)) had positive impact on “organization and marketing, Specifically, better use of the systems and system performance (Mohamed Yousif Abdalla Ali, 2017), had Positive effect between implementing integrated management system and business performance which provide framework to improve administrative practices and tools for continuous improvement. (Eman Hosseini, 2014). Preserve the environment and reduce the risks and the purpose of encouraging enterprises to improve the performance in Petroleum Corporation. (Mounir Siddiq, 2014) leading to the achievement of objectives efficiently and effectively. (Fayez Ghazi Abdullatif study 2018) Achieving competitive advantage in its dimensions (quality, low cost, speed of service delivery and the flexibility required to deal with variables), which can lead to the level of development and creativity, and thus achieve sustainable success through the adoption and application of quality management systems. (Tariq, 2017). Reducing costs, reducing defects and waste, improving productivity and continuous improvement of product quality, strengthening competitiveness, increasing market share to improve financial performance, increasing value added and building good reputation for the enterprise, thus contributing to sustainable development. ISO 14000 is to achieve the rationalization of energy consumption and natural resources, reduce pollution, compliance with environmental laws and legislation, improve the quality of products in terms of environmental protection consumer, achieve export requirements, good reputation of the enterprise and the

achievement of the achievement Sustainable development of the institution from the environmental point of view The adoption of OHSAS18000 leads to the management of occupational safety and health to reduce the number of work accidents and days lost as well as achieve a high degree of professional satisfaction in the employees due to the great attention and care and continued by maintaining their health , Physical, psychological and mental development and thus socially sustainable. Because of none availability of management commitment, lack of foreign currency, lack of economic and political stability, high inflation and the economic inconvenience that the country is going through with a weak culture of quality systems, which led to large deterioration of the Electricity sector in particular.

5.3.1. The relationship between Integrated Management System (Quality Management, and Environment Management System), Business results (Customer's satisfaction), the finding showed that one of the sub-hypotheses (Quality Management System) fully supported with Business results (Customer's satisfaction), and the second sub-hypotheses (Environment Management System) were not supported. These findings signify that Integrated Management System show partially supported on the relationship of Integrated Management System on Business results (Customer's satisfaction). Thus, over hypotheses are partially supported. Because, customers are interested in achieving their needs and desires even if they do not meet the requirements of environmental management system, but Quality management system is very concerned with customer requirements and satisfaction. This result matched with (Alexandra Simon and Luc Honore Petnji Yaya, 2012) were found positive impact from integration characteristics to marketing innovation. (Mohammad Asrul Mustapha.et.al, 2016) IMS application lead to Customer's satisfaction (Ahmad Ezzat.et al, 2017) stakeholder's

requirement and products sustainability. (Jorge.et.al, 2012) QM practices impact positively on hotel efficiency and quality service which lead improvements in customer satisfaction and sales, and the same is true of EMS. Through eco-efficiency. (Arne Remmen. et.al, 2005), IMS institutionalized throughout the organization and within its stakeholder relations. achieved competitive advantages can be, through focusing on customers. (Fayez Ghazi Abdullatif study 2018) The most important results were the existence of a correlation relationship between the strategic integration of ISO 9001 and GS 9004 Achieving competitive advantage in its dimensions (quality, low cost, speed of service delivery and the flexibility required to deal with variables), which can lead to the level of Customer's satisfaction. (Tariq Rashi study, 2017) gaining consumer satisfaction, strengthening competitiveness, increasing market share to improve financial performance, increasing value added and building good reputation for the enterprise, thus contributing to sustainable development.

5.3.1.3 The relationship between Integrated Management System (Quality Management, Environment Management System) and Employee's satisfaction the finding showed that one of the sub-hypotheses (Quality Management System) fully supported with Employee's satisfaction and the second sub-hypotheses Environment Management System were not supported. These findings signify that Integrated Management System show partially supported on the relationship of Integrated Management System on Employee's satisfaction. Thus, over hypotheses are partially supported. Because, Employee's satisfaction these result partially agree with (Yang Sui.et.al, 2018) Managing human and financial resources efficiently and Enhancing collaboration between departments. Arne Remmen. et.al, 2005) gives potential benefits such as description of responsibilities, employee motivation and participation. (Karapetrovic.et.al, 2012) The factor with the greatest

effect on the procedures related to improving the attitude and motivation of people. (Tariq Rashi, 2017) The adoption of Integrated Management System reduce the number of work accidents and days lost as well as achieve a high degree of professional satisfaction in the employees due to the great attention and care and continued by maintaining their health , Physical, psychological and mental development encouraging. (Eman Hosseini , 2014) enterprises to improve their performance, intensify training programs for employees according to the requirements of programs

### **5.3.2 The relationship between the Integrated Management System (IMS) and Human Capital Efficiency.**

5.3.2.1 Integrated Management System (Quality Management System and Environment Management System) has a positive effect on Human Capital Efficiency, the finding showed that one of the sub-hypotheses (Quality Management System) supported with Human Capital Efficiency and the second sub-hypotheses (Environment Management System) were not supported. Thus, over hypotheses are partially supported. Human Capital Efficiency, the finding was agree with (Fayez Ghazi Abdullatif, 2018), The most important results were the existence of a correlation relationship between Integrated Management System and Achieving competitive advantage which lead to the level of development and creativity, (Tariq Rashi, 2017) showed how the integrated use of encouraging enterprises to improve their performance developing encouragement, (Eman Hosseini, 2014) ISO standards contributed to the sustainable development and competitiveness.

### **5.3.3 Relationship between Human Capital Efficiency on Business results, (Achieving goals, Customer's and Employees' satisfaction).**

Findings of testing hypothesis concerning the relationships between Human Capital Efficiency on achieving goals has a positive effect and showed that sub-hypothesis fully supported, because employees in Sudanese Electricity Sector require employees who perform works affecting product quality appropriate skill, experience and competence and they have abilities to contribute achieving strategic goals, these result agree with (Alam Sageer.et.al.2012) develop strategies that strengthen the work environment and increase the employees morale and satisfaction, enhancing employees performance and productivity, which lead to high profits, customer satisfaction as well as customer retention.

### **5.3.4 Human Capital Efficiency mediates the relationship between Integrated Management System and the Business results**

The results indicate that Human Capital Efficiency as mediating partially Supported influenced the relationship between Quality Management and Achieving goals, and also the mediating partially Supported influenced the relationship between Environment Management System and Achieving goals , thus, it can be interpreted that Human Capital Efficiency partially mediated the relationship between Integrated Management System and the Achieving goals

The results indicate that Human Capital Efficiency as mediating fully Supported influenced the relationship between Quality Management and Customer's satisfaction, and also the mediating fully Supported influenced the relationship between Environment Management System and Customer's satisfaction , thus, it can be interpreted that Human Capital Efficiency fully mediated the relationship between Integrated Management System and the Customer's satisfaction

The results indicate that Human Capital Efficiency as mediating partially Supported influenced the relationship between Quality Management and Employees' satisfaction, and also the mediating partially Supported influenced the relationship between Environment Management System and Employees' satisfaction , thus, it can be interpreted that Human Capital Efficiency partially mediated the relationship between Integrated Management System and the Employees' satisfaction. (Tariq Rashi, 2017) The problem and objective of the study showed how the integrated use of ISO standards contributed to the sustainable development of the institution. Strengthening competitiveness, increasing value added and building good reputation for the enterprise, thus contributing to sustainable development. ISO 14000 is to achieve the rationalization of energy consumption and natural resources, reduce pollution, compliance with environmental laws and legislation, improve the quality of products in terms of environmental protection consumer, achieve export requirements, good reputation of the enterprise and the achievement of the achievement Sustainable development of the institution from the environmental point of view The adoption of OHSAS18000 leads to the management of occupational safety and health to reduce the number of work accidents and days lost as well as achieve a high degree of professional satisfaction in the employees due to the great attention and care and continued by maintaining their health , Physical, psychological and mental development and thus socially sustainable

- Second, although previous research has suggested that organizational strategic and system performance issues are the most important dimensions for predicting innovation (Helfat and Raubitschek, 2000), the present study found that “internal cohesion” was the most important factor in fostering innovation. This suggests that

managers of IMS should ensure that the climate and communication among employees are dealt properly in order to ensure that the organization's objectives are aligned with those of the employees. Managing these internal aspects in the organization can make employees aware of their role in the process of continual improvement of formalized product quality, innovation and customer service, leading the organization to total quality management and business excellence. Finally, customer satisfaction has become a vital concern for companies and organizations in their efforts to improve product and service quality, and maintain Customer loyalty within a highly competitive market place. Because we find that only marketing innovation relates to customer satisfaction, managers should adopt innovative marketing strategies to enhance customer satisfaction, especially with regard to optimizing perceived product and service quality to meet and exceed customers' expectations. Although the findings provide meaningful implications for organizations implementing MSSs or MSSs integration

#### **5.4. Theoretical implications:**

The importance of theoretical study in that it dealt with the integration of Quality management systems and Environmental and its impact on the development of business results. The topic of Integrated Management Systems is a relatively young topic started about 15 years ago (Alexandra Simon, 2012) and there are not enough studies that contribute to enlarge theory about it. As it is a very narrow topic, study aim to contribute to expand, in an exploratory way, the field of Management Systems Integration and expected to add to the following areas of knowledge about:

First, Provides and increased knowledge of impact of adoption of Integrated Management System (IMS) on business results with the presence of Human



Capital Efficiency as a mediating variable and to fill the gap in the relationship between the variables.

Second Contribute to the knowledge of the best modern, scientific methods for the rehabilitation of Sudanese institutions to implement the Integrated Management System, which proved successful methods to achieve excellent results.

Third contribution development of the concept of implementation of the Integrated Management System among leaders and employees by providing them with the knowledge, capabilities and requirements necessary to implement the system.,

Fourth a new methodology in order to be used as a road map for organizations to move toward an integrated management system and achieving excellent results.

Fifth the study highlights the importance of qualifying an efficient human resource possessing the modern professional expertise, capabilities and functional cadres required.

## **5.5. Managerial implications**

First, direct the attention of the leadership of the organizations towards this modern method and the possibility of its use and application at the level of management as one of the most important modern approaches that came from contemporary administrative thought.

Second, IMS practices reduce the time and costs then reinforce the process of continuous improvement

Third, Stable, environmentally friendly electricity generation with well trained, loyal, and initiators competency, and create win-win relationships with partners to achieve stakeholders' expectations

Fourth contribute to supporting managers and institutional staff to address the problems and difficulties that impede the implementation of the Integrated Management System and that result in weak product outputs.

Fifth Contribution is to develop a set of competencies that facilitates the development and implementation. Through existing quality culture and knowledge to acquire facilitates adoption of IMS practices. This means that Sudanese sector can take advantage of Human resources and capabilities

Sixth Contribution, IMS practices demonstrate positive effects on financial performance, market success, and customer and employee satisfaction, and assure continence improvement in Sudanese electricity sector, establishment works better. Consequently, it may be more cost-efficient, simultaneously reducing their Environmental impact, allow saving operation costs, which lead to efficiency improvement.

Seventh, study helps leaderships to evaluate the real level of integration of integrated management systems, and Human Capital Efficiency. Also recognizing the differences between the desired and current status, moreover the evaluation degree of achieving excellence Business Results. These evaluation methods identify the improvement areas and develop the strategies for the IMS implementation.

Lastly, enhance improving management system efficiency, create competitive advantages and to overcome of the drawbacks of separate implementation of management systems.

## **5.6. Limitation**

The main limitation in the present study were a cross-sectional design was carried by the researcher to examine the relationship of framework and the data collected by a survey designed to be responded by single respondent representing the organization based on organization unit of analysis this may represent the views of individuals within the organization single point of view sometimes effect on measurement errors and reliability (Abdasalam, 2018 ).future research should consider the issues of the unit of analysis in addition Longitudinal data can be gathered to test the whether the relationship and impact change over time.

Also limitation which should be addressed in the future is the sample size, organizations, which could be the cause that some of the hypothesized relationships are not significant. Furthermore, the sample in which this study is based was drawn from a single sector , which may limit the generalization of the results

Also, the responses analyzed only reflect the points of view of the company managers and other involved actors such as the auditors, but if employees or the customers had been the case, the richness of the data gathered would have been higher and therefore, the conclusions drawn for the study would have been more representative of the reality of these organizations.

Finally the survey was conducted in 2018 and due to the situation of economic crisis, economic deterioration, foreign currency shortage, inflation and siege. Therefore, the results should be taken with caution.

## **5.7. Future research**

Subject of future research is to analyze the benefits obtained from integration, i.e., analyze whether the anticipated benefits are actually obtained. With this data, to be able to compare difficulties and benefits future lines of research could be to update the research, replicate this study in other industries, and ask other employees to take part in the survey, although this fact might distort the results, since the manager is the only person who has a comprehensive knowledge of the degree of development of all managerial factors and firm performance.

Also, future research could focus on identifying the relationship between these variables and performance measures. It would also be interesting to study how the perception of firms regarding these interactions evolves over time. Future research could look at the difference between extent of integration for each of the management systems as well as between different organizations and sectors.

Finally, More research and practice is required to demonstrate whether the themes and trends suggested in the study are the correct direction of in which IMS management is covered, and what the impact of the ongoing changes will be regarding the future of integrated management systems

## **5.8 Conclusion:**

The study presented adoption of IMS in Electricity Sector (Khartoum state), based on the literature review in previous studies and the experiences of companies, it can be concluded that the integration of systems or standards is one of the major methods to ensure savings (cost, resources, time) At the same time it is also strongly recommended that a multi-functional team be put together to manage the process. This would ensure that all areas of the company are represented and consulted and the positive and negative issues relating to each function are considered in the integration process. According to Literature Review a number of benefits experienced by the companies from operating one integrated system such as better utilisation of resources and improved communication across the companies. However, for the benefits to be realized it is essential that Sudanese Electricity Sector are aware of the challenges and obstacles accompanied by integration of systems/standards. If these challenges are not addressed early in the process they can delay the completion of the integration process.

To conclude some recommendations for Sudanese Electricity Sector include, Top management must be committed, leading change and support excellence in performance. Companies have to establish measurable goals consistently with the policy, and goals should be relevant to conformity of products and services, and take into account applicable requirements. Companies should have adequate resources for the establishment, implementation, maintenance and continual improvement of the integrated management system and consider the capabilities of, and constraints on, existing internal resources, determine and meet customer's requirements to fulfill them continuously. Having communication and training across the organization in aspects of integration, and having integrated audits. Implementation of these recommendations may vary from one organization to another, more case studies and quantitative studies such as questionnaire surveys need to be undertaken to document the progress being made in the area of integration of management systems.

## References:

1. Abrahamsson, S., Hansson, J. and Isaksson, R. (2010).” Integrated Management Systems – advantages, problems and possibilities”, 13th Toulon-Verona Conference University of Coimbra, 2nd – 4th September 2010.
2. Ahmad Ezzat<sup>1</sup>, Sherif Bahi<sup>2</sup>. 2017, Tarek Nasreldeen<sup>3</sup>Towards Better Environmental Performance: A Framework for IMS International , Journal of Scientific & Engineering Research
3. Ahmed. et al, 2017Towards Better Environmental Performance: A Framework for IMS, International Journal of Scientific & Engineering Research, Volume 8, Issue 2 - 105, ISSN 2229-55182017
4. Alexandra Simon and Luc Honore Petnji Yaya, 2012 Improving innovation and customer satisfaction through systems integration, Journal of Industrial Management & Data Systems.
5. Ali Göksu, Ensar Mekic , 2014 “Implementation of ISO 9001:2008 & Standards for Accreditation at Private University in Bosnia And Herzegovina” , journal of European Researcher , Vol 75 , No 5-2 , , p p 947 – 962 .
6. Arne Remmen a,et al (2005) Integrated management systems three different levels of integrationm, Journal of Cleaner Production.
7. Bakhtah Hadar, 2012. The role of OHSAS 18001/2007 in improving employees performance, Univesity of Qasdy Merbah, Master degree,
8. Bernardo, et al. 2010, How integrated are environmental, quality and other standardized management systems? An empirical study, Journal of Cleaner Production, Vol. 17 No. 8, pp. 742-50,.
9. Branson, Christine A and Davis, Petie, 1998. “EMS: A Guide for Metal Finishers”, NSF International, Ann-Arbor, Michigan, USA
10. BSI, 2006. PAS 99 Specification of Common Management System Requirements as Framework for Integration. British Standards Institution, London, UK.
11. customer satisfaction (ISO 10000 series customer satisfaction,
12. De Araujo, Marcondes Moreira, 1996. “Quality and Environmental Management System: ISO 9000 and ISO 14000- An Integrated Management Tool: An Overview in the UK Manufacturing and Service Sectors, Master thesis, University of London, London, UK ,

13. Eman Hosseini, 2014. The Role of the Health, Safety and Environment Department in Reducing the Impacts of the Petroleum Industry on Health and the Environment, Sonatraka Case Study for Pipeline Transport, Qasidi, Marbah and Argla University,
14. Faysal Bashir Mousa, 2015. The Impact of Quality Management Systems (ISO 9001/ 2008) In Improvement Performance, Custom Affairs, Sudan University.
15. Federica Murmura, Nicola Casolani & others , 2018. “An empirical analysis of ISO 9001:2008 application in Italian services and manufacturing companies”, journal of Total Quality Management & Business Excellence, Vol 29 - NO 7-8 , 2018 , P P 1-16 .
16. Humberto Giacomello, Marcos Aurelio Gonzalez Stumpf , 2014. Implementation of an integrated management system into a small building company Journal of Construction, 2014
17. ISO 14001, Environmental Management Systems Requirements. International Organisation for Standardization, Geneva, Switzerland)
18. ISO 9001, 2008a. The Integrated Use of Management System Standards. International Organisation for Standardization, Geneva, Switzerland.
19. ISO, 2008b. ISO/TC176/N917 Serbia Meeting Communique 2008, ISO/TC176/N917 Serbia Meeting Communique 2008. International Organisation for Standardization, Geneva, Switzerland.
20. ISO, 2008c. ISO 9001 Quality Management Systems e Requirements. International Organisation for Standardization, Geneva, Switzerland.
21. ISO, 2010. The ISO Survey of Certifications e 2009. International Organisation for Standardization, Geneva, Switzerland.
22. Jonas Roosberg, Dadi Thorsteinsson, 2002. Environmental and health risk management for road transport of hazardous material, Department of Chemical Engineering II University of Lund, Sweden, P.O. Box 124 ,SE-221 00 Lund, Sweden, www.chemeng.lth, Telephone: +46 46 222 82, Fax: +46 46 14 91 56, www.brand.lth.se.
23. Jorge Pereira- Moliner, 2012. Quality management, environmental management and firm performance: direct and mediating effects in the hotel industry, Journal of Cleaner Production.

24. Joseph Mathew Whitaker, 2007. How Ehs Managers Can Influence Environmental Excellence Within Their, Ganization, Rochester Institute of Technology, WWW. ritdml.rit.edu., EMAILJmw5335@rit.edu.
25. Karapetrovicc .S,et.al, 2012. Integration difficulties influence management system ntegration levels, Journal of Cleaner Production.
26. Marieta, et.al, Establishing 2014. The basis for development of an organization by adopting the integrated management systems: comparative study of various models and concepts of integration, ScienceDirect jurnal,.
27. Mohamad Asrul Mustapha, et al. 2016. Sustainable Green Management System (SGMS) An integrated approach towards organisational sustainability Journal of Cleaner Production.
28. Mohamed Yousif Abdalla, 2017. EFFECT OF IMPLEMENTING INTEGRATED MANGEMENT SYSTEM ON ORGANIATION PERFORMANCE IN GIAD EISWEDI CABLE COMPANY, Sudan Academy of Sciences (SAS).
29. Muneer Seddeeq, 2011. Requirements of Fitness Between Quality and Environment by Chain of International Specifications ISO-9000 and ISO-14000 Doctoral Degree of the Philosophy in Business Management, the Case Study in Tasloja cement Plant In Solaymania. Council of British International University.
30. Obele Realman Evans,et al, 2017. Integrated Management Systems to Enhance Organization to Performance In Soome Selected Oil and Gas Companies in Port Harcourt NIGERIA, International Journal of Health, Safety and Environments (IJHSE) Vol. 3(4) 28 June.
31. OHSAS, 18001), corporate social responsibility.
32. Osmo Kauppila, 2015. Integrated HSEQ Management Systemems: Development and Trends, International Journal for Quality Research 9(2) 231–242 ISSN 1800-6450.
33. Pedro Domingues et al, 2015. Integrated Management Systems: Survey results from Portuguese companies and experts, research gate.
34. Polakowski, Ted D and Mach, Laurence, 1997. “ISO 14000 Certification: Lucent Technologies Microelectronics Group’s Strategic choice Assessment, Corporate Environmental Strategy ,USA.
35. SA 8000), information security (ISO 27001)



36. Tabassum, Tahsina, 2017. "Impact of Following ISO 9001:2008 on Firm's Performance, A Study on Influence of Internal Integration in Some Selected Readymade Garments Firms in Bangladesh", ASA University Review. Jul-Dec 2017, Vol. 11 No 2, p117-128.
37. Theofanis Stamou, Integrated, 2003. Management Systems in Small Medium-Sized Enterprises: Theory and Practice, Thesis presented in part-fulfillment of the degree of Master of Science in accordance with the regulations of the University of East Anglia
38. Yang Sui, Rui Ding, Hanqing Wang, 2018 An Integrated Management System for Occupational Health and Safety and Environment in an Operating Nuclear Power Plant in East China and Its Management Information System, Journal of Cleaner Production.
39. Zeng et al. 2010. A synergetic model for implementing an integrated management system: an empirical study in China", Journal of Cleaner Production, Vol. 15 No. 18, pp. 1760-7.
40. Zutshi, Ambika and Sohal, Amrik S. 2005 Integrated management system: the experiences of three Australian organizations, Journal of manufacturing technology management, vol. 16, no. 2, pp. 211-232,.

The appendices:

1. The questionnaire:

Sudan University of Science and Technology  
College of Graduate Studies



Dear.....,

## **Subject : Questionnaire**

A field study entitled: The impact of the application of the integrated management system on performance results (human capital efficiency Mediating Variable) is currently being conducted, a field study on the electricity production sector in Khartoum State, as a requirement for a PhD degree in Quality and Excellence Management from the Sudan University of Science and Technology. I would like to kindly thank you for answering carefully and objectively the items in the questionnaire that I have the honor to place in your hands. Note that the answers will be used only for the purposes of scientific research and will have a significant impact, God willing, in achieving honest results that serve scientific research and the aims of the study. Please accept my sincere thanks and appreciation.

The Impact of Integrated Management System on performance results (human capital efficiency Mediating Variable)

Personal Information:

Gender	Male			Female	
Age	25-30	31-35	36-40	41-50	50 and over
Qualification	Bachelor	Master		Doctorate	
Job	Gen. Dep. Manager	Dep. Manager	Section Manager	Unit Chief	Other
Experience years	5 and less	5 and less than 10	10 and less than 15	15 and over	

No	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
<b>Conformity to ISO 9001: 2008 Quality Management Systems Requirements</b>						
1	Company determines and meets customer's requirements to fulfill them continuously.					
2	Policy is clear, approved and declared to all partners.					
3	Company is committed to providing necessary resources to achieve system requirements.					
4	System is documented (processes and Procedures) and effectiveness.					
5	Company improves processes and procedures to ensure efficient performance.					
6	Corrective actions are performed to remove nonconformities and prevent its recurrence.					
7	Preventive actions are taken to remove and prevent expected nonconformities.					
8	The analysis and measurement processes are carried out to continuously improve system					
9	Feedback from partners used to improve					
10	Performance improvement, basing on internal and external audit results.					
11	Integrated management system is implemented as a tool of continuous improvement.					
12	Top management leads the change to the best and supports excellence in performance.					
<b>Conformity to Environmental Management System Requirements ISO 14001</b>						
13	Policy provides a framework for developing and reviewing environmental goals.					
14	Company determines environmental aspects that significantly impacts on environment.					

15	Company is fully aware of legal and regulating legislation regarding environmental aspects.					
16	Company has a plan and measures for identifying emergency and probable accidents.					
17	Company responds to situations and probable emergency and accidents.					
18	Adopted corrective and preventive actions are appropriate to size and severity of problems environmental effects.					
19	Management audit inputs include position of company's environmental performance.					
<b>Conformity to Occupational Health and Safety Assessment Series OHSAS 18001</b>						
20	Company fully aware of legal and regulatory legislation regarding occupational safety and health of employees.					
21	Company's management has a plan and procedures for identifying probable accidents					
22	Company's management has immediate measures for preparing and responding to emergency situations to ensure safety and					
23	Occupational safety and health system is effective.					
24	Employees are aware and cultured of occupational safety and health at work field.					
25	There are posters of notifications about occupational safety and health at workplaces.					
26	There is first aid kit ready for use at work area.					
27	Work environment is safe and free from hazardous exposures.					
<b>Business Outcomes: Achieving Goals</b>						
28	Vision and mission are published and clear.					

29	Vision is in line with the values of society.					
30	Application of Integrated Management System increased productivity					
31	Adoption of integrated management system contributed to development, quality assurance and continuous improvement.					
32	Procedures of environmental management system reduce using raw materials.					
33	Emissions and pollution rate decreased					
34	Implementing system at company decreased waste of resources.					
35	Noise rate decreased					
36	Implementing system reduced industrial waste.					
37	Occupational injuries and hazardous exposures are few.					
38	Reduce wasted hours.					
<b>Employee's Satisfaction</b>						
39	Equality and transparency the most important elements of the company.					
40	Company enhances communication between employees.					
41	Company aims at achieving satisfaction of all employees.					
42	Company provides moral support by motivating					
43	Workload is commensurate with entrusted to employees tasks.					
44	Company is keen to develop employees' abilities and competences through appropriate training					
45	Company aims at reducing turnover rate of employees (job stability).					

46	Company considers creating teamwork spirit and encourages work teams.					
<b>Customer's Satisfaction</b>						
47	Company has high potential in obtaining customer's and related information.					
48	Company has a clear mechanism to deal with customer complaints and deal with them professionally.					
49	Company uses information technology systems to handle customer's complaints.					
50	Product presented by company's management fulfills customers' needs.					
51	Company is keen to maintain its customers and increase their loyalty.					
52	Implementing system reduced customers' and local community's complaints.					
53	Company improved mental image of customers.					
54	Integrated Management System contributes to increase partner's satisfaction continuously.					
55	Company is committed to increase progress of its position and credibility at community.					
<b>Core Capabilities: Competences</b>						
56	Company determines training needs and required cadres to establish system requirements.					
57	Company supports employees learning new skills that increase their performance quality.					
58	Company requires employees who perform works affecting product quality appropriate skill, experience and competence.					
59	Employees are judged to be competent according to personal qualities and ability to perform entrusted tasks.					

60	Company has competencies that are not possessed by competitors.					
61	Employees have abilities to contribute to achievement of strategic goals.					
62	Employees respond quickly to change.					
63	Company considers recruitment and maintaining of competent employees.					
64	Company encourages learning and cares talent.					
65	Company supports individual initiatives and innovation.					

## 2. Arbitration committee:

Name		Address
1	Professor: Fikry Kabbashy Alameen	Nilaen University, Deanship of Quality and Development
2	Dr. Ahmed Musa Ismail	Sudan Open University
3	Dr. Abdulla Abdrahim Idris	Bank Deposit Guarantee Fund
4	Dr. Abdel Muntaleb Ibrahim	Sudan University of Science and Technology, Deanship of Quality and Development
5	Dr. Kabbashi Hamed Nouredine	Nilaen University, Department of Business Administration
6	Dr. Mohamed Yousef Abdullah Sudan	Academy of Administrative Sciences
7	Dr. Abdelsalam Adam Hamed	Sudan University of Science and Technology ,Head of Business Administration
8	Dr: Muhannad Hassan Ismail	Sudan University of Science and Technology, Deanship of Quality and Development
9	Dr. Ashraf Hassan Idrees	Sudan University of Science and Technology, Statistics and Information
10	Dr. Alshakhe Mohmed Alkhider	Karery University Business Administration