AN EVALUATION OF INFORMATION SYSTEM SUCCESS BASED ON STUDENTS' PERSPECTIVE: THE CASE OF HADRAMOUT UNIVERSITY

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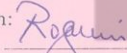### IBRAHIM ESKANDAR IBRAHIM FADHEL
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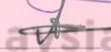*(candidate for the degree of)* **MSc. Information Technology**

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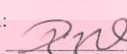*(has presented his/her dissertation of the following title)*

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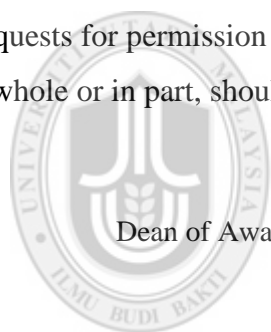
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Abstrak

Penilaian sistem adalah bahagian yang penting dalam pembangunan sistem bagi meningkatkan prestasi sesebuah sistem. Walau bagaimanapun, kajian telah menunjukkan kurangnya penyelidikan terhadap penilaian kejayaan sistem maklumat di universiti-universiti di Yaman. Dapat juga diperhatikan bahawa banyak projek sistem maklumat yang dibiayai di Yaman telah siap dan dilaksanakan tanpa dibuat penilaian. Sistem Maklumat Pengurusan Pengajian Tinggi Yaman (YHEMIS) antaranya merupakan pembangunan aplikasi berskala besar dan telah dilaksanakan tanpa penilaian. Justeru, kajian ini menilai aplikasi YHEMIS dengan meneliti faktor-faktor yang mempengaruhi kepuasan pengguna dan penggunaan sistem yang akan memperlihatkan manfaat sistem berkenaan. Kajian ini mencadangkan model DeLone dan McLean dengan tambahan sokongan pengurusan sebagai faktor luaran untuk mengenal pasti apakah faktor yang mempengaruhi penggunaan YHEMIS dan begitu juga faktor yang menjejaskan kepuasan pengguna ketika menggunakan aplikasi. Tujuan kajian antara lain adalah untuk mengetahui sama ada pembangunan YHEMIS memberi manfaat kepada pelajar. Kajian ini menggunakan kaedah kuantitatif dengan mengagihkan borang soal selidik kepada pengguna (iaitu pelajar) YHEMIS di Universiti Hadramout. Kaedah pensampelan rawak berstrata digunakan, dan sebanyak 261 borang soal selidik telah dikumpulkan. Dapatan kajian menunjukkan bahawa kualiti maklumat, kualiti sistem dan sokongan pengurusan mempengaruhi penggunaan dan kepuasan pengguna serta memainkan peranan penting dalam kejayaan YHEMIS. Selain itu, hasil kajian menunjukkan bahawa kepuasan pelajar mempunyai kesan yang kuat ke atas faedah bersih persepsi yang dibawa YHEMIS untuk pelajar. Penyelidikan ini menyediakan data empirikal pertama terhadap penilaian kejayaan sistem maklumat yang dijalankan ke atas YHEMIS bagi sebuah universiti di Yaman. Berdasarkan keputusan kajian, pihak yang berkepentingan boleh mendapatkan maklum balas untuk menambah baik sistem dan memberi input untuk membangunkan projek-projek sistem maklumat. Dapatan kajian juga berupaya memberikan sokongan kepada pengurusan Universiti Hadramout terhadap projek-projek atas talian yang lain. Oleh itu, YHEMIS boleh dikatakan berjaya dan kepuasan pengguna (pelajar) boleh dianggap sebagai penanda aras kejayaan ke atas penggunaan sistem dan faedah bersih.

Kata kunci: DeLone dan McLean, Yemen, Mukalla, Universiti, Sistem Maklumat, Penilaian, Kejayaan, Sokongan Pengurusan, Pelajar.

Abstract

Evaluation of systems is an important part of systems development to improve systems performance. However, studies showed a lack of research done on information system success evaluation in Yemen universities. It was also observed that many funded information system projects, in Yemen, were completed and implemented without evaluation. The Yemen Higher Education Management Information System (YHEMIS), is a large scale application developed and implemented without evaluation. Hence, this research evaluates the YHEMIS application by investigating into the factors that influence user satisfaction and system use which will further show the benefit of the system. This research endeavors to propose an evaluation DeLone and McLean model with the addition of an external factor management support to identify what factors influence the use of YHEMIS and likewise affect the user satisfaction when using the application. The aim of this study is to also to find out whether the development of YHEMIS is of benefit to the students. This study applies the quantitative approach to distribute questionnaires to users (students) of YHEMIS in Hadramout University. The stratified random sampling method was used, and 261 questionnaires were collected. The research findings showed that information quality, system quality and management support influenced the use and users satisfaction and played a vital role in the success of YHEMIS. The findings showed that students' satisfaction have the strongest effect on the perceived net benefits YHEMIS brought for the students. This study provides the first empirical data on the evaluation of information system success conducted on YHEMIS for a Yemen university. Based on the results, stakeholders can get the feedback to improve the systems and provide input to develop other information system projects. The research findings can provide the support to the management of Hadramout University to other online projects. Hence, YHEMIS can be said to be successful and users (students) satisfaction can be considered as the indicator of the success on system usage and net benefit.

Keywords: DeLone and McLean, Mukalla, University, Information System, Evaluation, Success, Management Support, Students.

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All praise is due to Allah, who has allowed me to complete this research. This research has given me so much experience in enhancing knowledge. I learned a lot in process of making of this study, and I know it can be useful for me in the future.

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Glossary of Terms

Acronym	Definition
IS	Information System
ISs	Information Systems
IT	Information Technology
ISD	Information Systems Development
DM	DeLone & McLean
HDI	Human Development Index
YHEMIS	Yemen Higher Education Management Information System
ICT	Information Communication Technology
SPSS	Statistical Package for the Social Science
PLS	Partial Least Squares

CHAPTER ONE
INTRODUCTION

Chapter one gives an idea about this study. This chapter describes the Background to the Problem Statement, Problem Statement, Research Questions and Objectives, Scope, and Significance of the study.

1.1 Overview

Information system (IS) research has been evolved from well-formed majors like (computer science, operational research, organizational behavior and administration). However, information systems (ISs), itself, cannot develop an individual discipline, even though; it is deemed as a valid applied research that supports the organizational process changes. Supporting deep understanding of IS needs analytical, empirical models and conceptual research (Irani, Gunasekaran & Love, 2006). Irani et al (2006), emphasized that IS had formidable impact in all parts of society including education, health, etc. IS life cycle begins with its creation and ends with its termination. Actually, information systems development (ISD) follows the IS life cycle.

ISD is a long process that is comprised of various stages and based on Cohen (2010), these stages are "requirements, analysis, design, coding, testing, installation, operation, maintenance and less emphasized retirement". Based on Jirava (2004), "investigation, user requirements, analysis, design, implementation and release" are the stages of the IS life cycle. Thus, an information system can be initiated and implemented, but changes are needed from different stakeholders.

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Therefore, the last stage of information system development life cycle is to evaluate the system maintenance until there is a need to replace or upgrade. Information systems are categorized as a complex structure and are purposed for organizations specific tasks. According to Isaias & Issa (2015), IS life cycle is segmented into analysis, design, development and evaluation. Evaluation is the guider of all the stages, all stages must be evaluated and, at the end, IS must be evaluated to satisfy the characteristics of the IS engineering life cycle.

Therefore, to achieve the results and planned objectives, many institutional organizations such as education organizations, health organizations, business organizations and other organizations, implemented IS effectively. However, numerous organizations have already failed to fulfill a full potential of information systems development with respect to organizational aims. This failure is due to the lack of tools or knowledge that are required for the assessment of the success of information systems (Irani et al., 2006; Piccoli, 2012).

1.2 Background to the Study

Organization undergo changes due to external or internal environmental pressures that, in turn, will make new demand on the IS which has been unavoidable. As investment in IS is costly, organizations need to constantly evaluate and improve IS performance in order to improve the business process for achievement of business related goals. Moreover, a number of factors needs to be evaluated for getting benefits that will help in determining the success or failure of such systems (Moh'd Al-Adaileh, 2009).

The field of information system is rich with literature in evaluation that effectively evaluate IS success, and there are many methodologies that can help such as DeLone & McLean. The complexity of the system has been widely known and such complexity makes it necessary to evaluate for measuring contribution of IS (Stockdale & Standing, 2006). Since DeLone & McLean (DM) developed their IS success model, much research on the success as well as extension and tests of their model, in academic literature more than one hundred eighty papers have studied IS success (Petter, DeLone & McLean, 2008).

Yemen is one of the poorest countries, based on the report of Human Development Index (HDI) and report of United Nation. Yemen is also counted among the poorest countries in the Arab world and it is ranked 154. Being placed medium among human development countries, negatively affect all aspect of life in Yemen, especially the field of education and scientific research (Baheshwan, 2014).

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Therefore, according to researches, there is lack of studies related to IS success evaluation conducted in Yemeni context, right now, many institutional organization such as Hadramout University started the implementation of ISs and are making efforts for the success of these systems to measure the achievement based on the perspective of user's (Baheshwan, 2014).

Supporting the deployment of IS/IT in education organization in Yemen is in need of more academic research (Rakels, 2012). There is a funded project (Introduce IT based Services to the Yemeni Public Universities) for supporting the universities in Yemen with information systems. Such a project is organized by the Yemeni Center for Information Technology, which is related to The Ministry of Higher Education and is purposed for enhancing the level of Yemen post studies through utilizing the different services of the Information and Communication Technology (ICT) (Baheshwan, 2014; YCIT, 2010).

One of these systems is Yemen Higher Education Management Information System (YHEMIS) that is implemented in 2013. This system is compulsory for students in five different universities of the country in order to be registered. This IS project has inspired the researcher to conduct an exploratory research on the evaluation the YHEMIS success and examine some of these important factors for information systems success in Yemen. The students' perspective in Hadramout University will encourage further studies in this field in Yemen. Indeed, DeLone and McLean strongly call for IS success evaluation and this dissertation aims to be in pursuit of this call (Petter et al., 2008).

1.3 Problem Statement

Data and information, which are saved in the IS, could be used to improve decision-making. The failure of information system remains a problem for the organization and thus, there is a need to identify this lack of success. The factor that leads to ISs success is failure identification for the maintenance of the systems. The assessment of Information systems success is necessary as a chief condition to make the IS success better in the future. The environment often put pressure on the "changing entity", characterized by public and private organizations, which will stimulate subsequent changes to update information systems. Thus, post IS implementation evaluation will provide a good benefit and to make use of these benefit an extensive and comprehensive consideration is required for assessing the success. The study identify a number of factors that can show the lack of success (failure) or ascertain success of these systems (Moh'd Al-Adaileh, 2009).

Information systems evaluation is the process of assessing value of proposed or extant systems, and has been described as a barbed problem. This issue has increased in severity as systems and the condition, in which they are involved, has been more necessary and difficult (Whittaker, 2001; Whittaker, 2005). Evaluation is necessary part for all information management systems and from the perspective of the management evaluation, is the worth of IT/IS to an organization (Galliers & Liedner, 2014). Previous studies have contributed to the field for improving IS success but more focus needed in this field (Petter et al., 2008).

Indeed, IS evaluation is important for organization despite the concept of evaluation has not been subjected to extensive research (Irani & Love, 2000; Urbach, 2012). Providing competitive edge to the business is the role of ISs and IS success evaluation is the recently subject of much debate (Zaied, 2012). Organizations consider the failure of ISs a major concern and to target this failure, information system assessment is a main step and condition to make the rate of success increase. The initiatives of the future of the information systems, opinions of users are deemed as success determinant for any Information system enterprise (Moh'd Al-Adaileh, 2009).

The Yemen Higher Education Management Information System (YHEMIS) project is developed during the development process program to support the universities with ICT. Based on (Irani & Love, 2001), evaluating the success in ISs is a critical issue and it is a key concern by the executives of organization throughout the world to manage carefully and successfully. Many universities, now a day's, deploy and improve their ISs to optimize and maintain the academic performance and to meet the changes occurred in different systems (Dadmand, 2014). The vice minister for higher education and scientific research in Yemen, Dr. Mohammed Al-Mottahar, wants to deploy IT & IS to strengthen academic performance in contribution to the sustainable development, national and global society that needs good education and scientific research in the fields of IT/IS (Rakels, 2012).

Academic researches for the deployment of IS in the context of educational organization are needed, as example IS success evaluation researches help the organizations to know about the information systems that are applied whether it is success or not and whether it is developed and working properly or not. The benefit of information system success evaluation, based on user's' perspective, is risks aversion (Baheshwan, 2014).

Today's organizations are in need of powerful information system. The university is developing and improving their information systems in order to optimize the processes within an organization and many manual modes are made automatic. The largest changes occurred in different social systems, that are increasing pressure on universities to use information technology to improve student performance has been (Powell 2008).

The creation and implementation of powerful information systems, to increase the performance of student, will be crucial in universities, leading to the formation of successful information systems (Rai, Lang and Welker 2002). Many universities are looking for an information management system as a way to enhance their students' performance (Powell 2008). Nowadays, Universities and institutions, deploy and improve their ISs to meet the changes occurred in different systems and also to optimize organization process today educational organization are in need for IS (Dadmand, 2014).

Based on the interview that was conducted with the Director of Information Systems at Hadramout University Miss.Fawzia Baheshwan (2014), who confirms the need for ISs evaluation based on student's perspective, because there is a lack of research related to the field ISs evaluation. According to the Director, it is urgent to know whether (YHEMIS) is a success or not based on student's perspective. It is necessary to find out whether YHEMIS benefited the students or not. The result can help us in the future to send it to the stakeholders in the organization (Baheshwan, 2014).

When understanding that IS is a part of the organization, it is clear that an evaluation is not only to concentrate on the system itself but on the interaction between the users and the ISs in a given environment. Thus, evaluation requires not only an understanding of ISs, but also of the success of these ISs based on the perspective of the users'.

The researcher noted that many funded IS/IT projects, in Yemen, completed and applied without evaluation and this lead to problems such as give bad idea to the supporters which lead to an end of support, organization fill and lose a lot of money, and prevent the upcoming funds from the donor countries (Baheshwan, 2014).

The main problem is that the large-scale application Yemen Higher Education Management Information System was developed and implemented without evaluation. This IS is categorized as large and important system applied in the public Yemeni organizations (Universities). YHEMIS, has not been evaluated before and it is not known either it is success or failure based on the student's perspective.

Obviously, it is very important to do an IS evaluation based on student's perspective for the YHEMIS.

In general, Organization consists of four main components Structure, Technology, People and Tasks (Bostrom, 1977). Organization in Yemen like most other organization in the Arab region consists of people structure technology and tasks. Public organization in Yemen almost same in the infrastructure and way of management (Bazarah, 2015).

Based on these our research can be generalizable and can be applied in other organization because of the phenomena of same organizational structure in the Yemeni public organization. YHEMIS applied in five Yemeni university so, this study can be generalized on the rest four university, because they have the same infrastructure and same information system.

The success of the YHEMIS, can be evaluated in terms of (information quality, system quality, service quality and management support) that will influence the use and user satisfaction to evaluate the benefit of (YHEMIS). These factors affect the subsequent use and user satisfaction, and the benefit of (YHEMIS) will be determined. The real benefit of the system will only be known, after this study and maybe positive or negative.

Mohammed Al-Adaileh (2009) noted based on Whyte et al, (1997), it seems that there is no single overall set of attributes that relate to users' perspective of ISs success, but it is possible to find subsets that do. The measurement and

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analysis of these attributes are helpful in setting management policies and guidelines for the improvement of perceptions of ISs success.

This research endeavors to develop a research that link the management support factor to the benefit of IS via the DM updated success 2003 model. Because DM conducted numerous research of IS success to create his model. Many studies encourage governmental organization to do evaluation based on the information quality, system quality and service quality (Zaied, 2012). Based on the studies of Mohammed Al-Adaileh (2009) and Kamel Rouibah and et al (2009), Management Support factor play a vital role in evaluation the success of IS in Arab region and affect on the use and user satisfaction of the system.

1.4 Research Questions

This study aims to evaluate the benefit of Yemen Higher Education Management Information system based on end student's perspective. Therefore, the following are research questions to be solved:

1- What are the factors that influence the use and students' satisfaction of the Yemen Higher Education Management Information system (YHEMIS) in Hadramout University?

2- What is the benefit of Yemen Higher Education Management Information system (YHEMIS) to the students?

1.5 Research Objectives

This main research objective is to assess the net benefits of Yemen Higher Education Management Information system (YHEMIS) and the sub objectives are formulated as below:
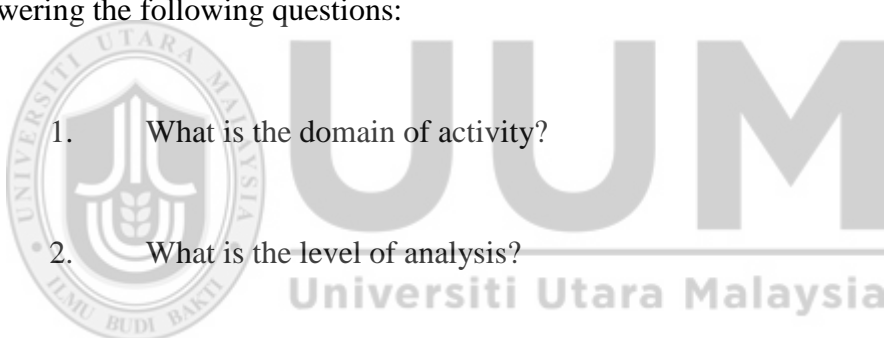
1- To discover the factors that influences the use and students' satisfaction of Yemen Higher Education Management Information system (YHEMIS) success.

2- To determine the benefit of the Yemen Higher Education Management Information system (YHEMIS).

3- To validate the proposed model depends of the finding of the research data and information.

1.6 Research Scope

In this research, the focus is on evaluation of information system. The YHEMIS will be evaluated from users (students') perspective based on DM 2003 model with the external factor:

Information quality, system quality, services quality, management support, use, user satisfaction and YHEMIS benefits.

In order to do IS success evaluation this research should follow the suggestion of (Seddon, Staples, Patnayakuni & Bowtell, 1999; Shang & Seddon, 2000) by answering the following questions:

1.   What is the domain of activity?

2.   What is the level of analysis?

3.   What is the purpose of evaluation?

YHEMIS is large integrated application that considered as primary central applications for student information and it is not considered as a full student portal. It allow the administrator to manage the students information from registration to graduate like (students details, marks, status, etc.) and it is allow students to register and deal within the related details of the study until they graduated (Baheshwan, 2014).

An external factor, management support, is added to enhance DM model. This is to find out whether the support of the management affects the use and user satisfaction.

The domain of activity describes the unit of analysis of the study and unit of analysis need to be clearly defined from the outset. Unit of analysis for the survey in this research is the individual end users (students of level one 2014-2015).

The purpose of evaluation is to know whether the YHEMIS is successful or not because it has not been evaluated yet. To discover what factors that influence the use and students' satisfaction of (YHEMIS), to investigate the proposed model depends of the finding of the research to ensure its validity and reliability of use in a Yemeni context and to determine the perceived net benefit.

There are five public universities in Yemen who has implemented the (YHEMIS) and Hadramout University is the biggest and has many students. In addition, Hadramout University ranked as the second university based on number of students. Only Hadramout University allows the research to be done.

The undergraduate degrees in Yemen consist of four Levels. This study will select end users (students of level one 2014-2015) selected randomly from three colleges located in Mukalla, who used the YHEMIS.

By gauging different views of (YHEMIS) using the questionnaires, which will be answered by the students, the study will attempt to achieve the main aim of the research, which is to evaluate the success of (YHEMIS) at Hadramout University.

Students' management information system	Staff management information system	Financial management information system	Learning Zone management information system	Faculties' management information system

IS Success Evaluation

Requirement Analysis

YCIT-HE

Implement IS at five universities

Design Specifications

Design, Develop and Test the IS

Universiti Utara Malaysia

Hadramout University Users are students & staffs	Taiz University Users are students & staffs	Hodedah University Users are students & staffs	Sanaa'a University Users are students & staffs	Aden University Users are students & staffs

1.7 Research Significant

It is believed that evaluation the success of information systems is important for an organization and it is an integral part of IS's investment. However, it is difficult and faces challenges ranging from conceptual to operational issues. Research in this area is justifiable and desirable. One of twenty first century challenges for information system researchers is the evaluation of information system's success. This continuous challenge has led numerous enterprise administration professionals trying to identify the factors that need to be solved out to result in a full successful project.

Many of the projects funded in Yemen ceased at their final stages. That is because of the lack of evaluation. Organizations need to perform and carry out an assessment criterion to assess and prioritize investment in information system and information technology that controls the information systems costs. There is also a need to identify the values arising from IS/IT that will mark out the changes required to the organization's information system portfolio, and the study of successful strategies for information systems management and development.

Information system is the essential requirement of today's life and critical part of mid-sized academic organization like universities. The huge amount of data generated and increasing number of information systems developed will tabulate and record all the important process and internal controls of the organizations.

Information systems have various significant functions, ranging from allowing businesses to tracking the information users in our case (students). Benefits of IS mostly come from the integration of all the necessary management functions across the organization, which in turn allow the organizations to make its management processes more efficient and effective.

There has been much research on the topic of evaluation of IS success. However, few studies in this field have been done within the Arab region. Yemen now urgently needs studies in this area of evaluation of Information Systems and build a

process of development within this sector. Rapid development in IT sectors in Yemen occurred between 2006 and 2011. However, as seen in other countries, Jordan is also seeking hard to develop Information systems and information technology sector to support its developmental process. Yemen has achieved great and real results in this field in particular in the scope of developing policies and plans, adopting infrastructure components, information systems applications, and human capacity building.

It is important for studies to be conducted in the IS evaluation field since there is central interest in the importance of IS evaluation in an organization and this is the motivation of behind my research. This research aims to offers essential contribution to different stakeholders including decision makers in Yemeni Center for Information Technology in higher education.

This study expects to contribute significant theoretical and practical contributions in the domains of information system. Only few studies can be found in Arab region and studies in the success evaluation are lack. Researcher finds only one study related to the success evaluation and the studies of information system in Yemen are very lack and for the success evaluation filed almost nonexistent. Accordingly, doing this study in Yemeni context would have provided additional theoretical knowledge related to understanding of ISs success evaluation and due to lack of studies related to ISs success evaluation in Arab region and Yemen as special case this study contributes to the existing body of knowledge by evaluation the success of YHEMIS. More over this study contribute the body of knowledge by investigate the proposed model depends of the finding of the research to ensure its validity and reliability of use in a Yemeni context.

This research will contribute to extend the existing literature by investigating the affect of Management Support factor on the use and users satisfaction. This study planned to fill the gap of lacking studies of IS success evaluation and to open the way to do more studies in Arab region. Furthermore, aimed to enhance our

understanding of how IS success evaluation is an important for an organization and it is an integral part of IS's investment.

In terms of the practical significant of the study, this study is expected to provide new insight into IS success evaluation in Arab region. The findings should also help decision-makers and IS manager of Hadramout University to know about the YHEMIS success or failure. Such IS success evaluation will improve the next project that is going to be developed under the Yemeni center, reducing the risks of failure. Furthermore, this research aims to offers essential contribution to different stakeholders including decision makers in Yemeni Center for Information Technology in higher education.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter which is essential part of any research aims to provide insights into prior research in the scope of IS success evaluation. The definitions, concepts and contributions from past research in the topic will be stated. Several theories on IS success will be reviewed and discussed. The written works seeks to assess and examine studies that have been done related to the domain of the research.

It's normal to refer and relate previous studies to your research it is providing evidence for justifying selected procedures. The primary goal of doing literature review is to review what researchers have done in the same area of the research with the aim of 'describing theoretical perspective and previous research findings related the problem at hand' (Bandara, 2007).

2.2 Information System Evaluation in General

ISs success evaluation identified in IS area as critical issue, many studies such as Moh'd Al-Adaileh (2009), have been performed to search and explore this value issue. However, proper group of variables that may be used to identify the user's understanding of information systems success as a main determinant for the success as ISs are chiefly running to serve the end user. Plethora of IS used in organization such as student information system, human resource management system, e-commerce and many others, so doing IS success evaluation which categorized as complex and illusive is necessary (Petter, DeLone, & McLean, 2008).

Actually, information systems attempt to satisfy users' need, enhance users' ability to perform better, meet and satisfy organization targets and deliver worthy benefits. Through an evaluation for the success of ISs, which offer ubiquitous portfolios of tangible and intangible benefits to an organization, this research is deemed as a try to meet this end.

Moh'd Al-Adaileh (2009), cited based on CHAOS report that eight thousand three hundred eighty, information system applications under development, information system projects deemed as successful in the case of complete on time and budget with satisfaction of all specified function, sixteen point two percent of projects fell in this category. Information system project deemed as partial failure in case of completed the project but with over cost and time and/or features and functions that already specified are lack, fifty two point seven percent of all studied projects fell into this category. Information system project deemed as full failure in the case of at the some point the project cancelled or abandoned, thirty one point one percent of all studied projects fell into this category. (Dominguez, 2009), conclude that a project success is little worse than the year 2006 but definitely better than year 1994. He also confirmed that CHAOS report is still to be an important measure for the IT industry in general and IS.

Information system evaluation is so important because it is assess the benefits and values to the organization and it is provides feedback to the stakeholders and peoples in responsible position in the organization (Irani & Love, 2008). Stockdale and Standing (2006), noted based on Hirschheim, Smithson and Walsham, the calls for interpretive approaches to IS assessment have been increased since the late 1980s because it constitute the avowal of information systems as technical entities and social. Dealing with IS assessment as a technical issue leads to meaningless results that have a view on the social activity deep rooted in assessment operation and it disregard the political social domain of an organization. Strengthening the understanding and generation of commitment and the motivation to an assessment requires interpretive approach, However there are numerous approaches for

information system assessment, there are still few examples to build the assessment that involves more wide context of an organization (Stockdale & Standing, 2006).

Based on Gordon (2012) and Kanaracus (2008), organization at all continue and persist to increase spending on information systems budget, one of the big problems for information system assessment is to develop IS assessment model adequately comprehensive to be usable to a large scale application, but also adequately detailed to make provision efficient guidance and results after the assessment has to clarify and explain if effectiveness is to be fulfilled (Stockdale & Standing, 2006).

There is a concern that information system is not delivering what it promised and this lack of delivery based on Irani and Love (2001), because the difficulty in determining business value from IS. Actually IS evaluation is often infectively or neglected and this neglection causes major problem in measuring the benefits and this the reason for doubt about the IS expected impact, in fact the causes of IS neglection are the mangers of organizations so it is only depends on the natural of the managers to assume that they should doing IS evaluation for their organization (Zahir, 2000).

Acknowledgement of the socio political context and stakeholders role requires an explanatory method for allow strengthening and generating the stimulus and commitment to an assessment. However, there are numerous ways and methods for assessing the systems, several of them summarized in essential appraisal such as (DeLone & McLean, 1992; Powell, 2008; Seddon, 1997).

Rabaa'i (2012), based on his literature note that organizations have relied on IS to improve their performance, flexibility and competitiveness; they are yet facing difficulties of how IS and should be effectively and efficiently evaluated. According to Rabaa'i (2012), many IS practitioner do not do evaluation of their IT/IS investments and he noted that there was interviews with seven organizations in Finland and Estonia, state that just three organization did system evaluation.

Lack of knowledge about IS evaluation is the reason behind why organization did not do IS evaluations. It is confirmed that by academics yet struggle as well as practitioners with how to evaluate IS success (Ifinedo, 2006).

Sabherwal et al (2006), confirmed that the understanding of information system success is still elusive "a comprehensive understanding of IS success thus remains elusive". Rai (2002), suggested that "the problem lies in the ambiguity of the concept and the multiplicity of IS success constructs pervading the research". With the large IS investment, the mixed result of IS investment the increasing complexity of IS combined with unfulfilled expectation of the success evaluation of IS has become a critical issue in the literature of IS (Petter et al., 2008).

As stated by Ifinedo (2006), IS success measure are divided in two types: subjective measures and objective measures. Subjective measures, concentrate on perceptual or attitude measures like user satisfaction that introduced by Bailey & Person in (1983), user acceptance which introduced in (1989) by Bagozzi, Davis and Warshaw. Whereas Objective measure focus on "Net Present Value (NPV)" and "Return on Investment (ROI)" as example Seddon (2002).

In the opinion of Rabaa'i (2012), depend and use of perceptual measures allowing IS evaluation to be assessed from different angles of IS success comprising System Quality, Information Quality, Use as example (Delone, 2003; DeLone & McLean, 1992; Gable, Sedera, & Chan, 2008; Ifinedo & Nahar, 2007; Petter et al., 2008; Shang & Seddon, 2002). Actually, these measures are dominant in IT/IS value literature. However, it has been argue by many IS researchers the only use for objective measures to evaluate the success is not enough and often inadequate. Contemporary large scale integrated IS like (Human Resource Management System, Student Management System) provide tangible benefit such as cost reduction and in intangible benefits such as accuracy, reliability and flexibility. Intangible benefits are difficult to quantify thus making objective measures inappropriate to evaluate IS effectiveness as example Wu (2006, 2007).

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From one side to the other, it is observed that a lot of evaluation IS success studies are existed. However, IS success not captured by robust and structured models (Petter et al., 2008). In addition, it is noted that evaluation IS success studies related to the context of educational organizational such institute or university are lack (Baheshwan, 2014). Into the bargain the domain and methods to IS evaluation studies research have diverse to a great extent and there is little unanimity on the proper evaluation of IS success (Sabherwal, Jeyaraj, & Chowa, 2006).

IS evaluation researches have employed a diversity of methodologies such as case studies and surveys. These studies have varied greatly in terms of scope, data collection approach, perspective and research paradigm (Rabaa'i, 2012).

2.2.1 Definitions and Concepts

The Information System theory, which presented below DeLone and McLean (1992), began developing during the '50s in the field of positive sciences and it is defined by certain feature (Mamma, 2010). Based on Mamma (2010), the concept of information systems can be defined, as "It is the mechanism providing the means for collecting, storing, producing and distributing and distributing information serving the information needs of an organization, while supporting its operation, both at managerial and operational level, at planning and decision-making level for the organization".

"An information system (IS) is a set of interrelated components that collect, manipulate, store and disseminate data and information and provides a feedback mechanism to meet an objective" (Irani & Love, 2008).

"Information system is a combination of hardware, software, infrastructure and trained personnel organized to facilitate planning, control, coordination, and decision making in an organization" (InformationSystem, 2014).

IS can be defined as "Information system is a computer based system with the defining characteristic that it provides information to users in one or more organizations. Information systems are thus distinguished from, for example, real-time control systems, message-switching systems, software engineering environments, or personal computing systems" (John, 2004).

The IS could have a wide meaning than proposed, regarding to the extent of meaning of the words information and system. It could, for example be widened to encompass all based computer systems or further widened to include the non-based computer systems. Consequently, within the domain of based computer systems, the more identified term "Organizational Information System" is sometimes used (John, 2004).

According to business dictionary definition of IS it is "A combination of hardware, software, infrastructure and trained personnel organized to facilitate planning, control, coordination and decision making in an organization" .

As stated by Irani (2008) "An information system is what emerges from the usage that is made of the IT delivery system by the users whose strengths are that they are human beings not machines".

Irani (2008), noted that definition of IS evaluation can be seen as "A process that takes place at different points in time or continuously, for searching for and making explicit, quantitatively or qualitatively, all impacts of IS project".

IS evaluation is still thorny problem and go into definition "IS evaluation is the process of assessing or justifying the value of information systems for the purpose of organizational decision making through some kind of organizational discourse" (Irani et al., 2006).

University categorized as an organization based on this definition "An organization is a formal collection of people and other resource established to accomplish a set of goals. The primary goal of a for-profit organization is to maximize shareholder value, often measured by the price of the company stock. Nonprofit organization include universities, social groups, religious group and other organization that do not have profit as their goal" (Stair & Reynolds, 2011).

Organization can be described as "The act or process of putting the different parts of something in a certain order so that they can be found or used easily" or "The act or process of planning and arranging the different parts of an event or activity" (Organization, 2014). Organization can also be defined as "A generic term for any type of group or association of individuals who are joined together either formally or legally" (Organization, 2014).

Based on business dictionary the definition of organization can be seated as "A social unit of people that is structured and managed to meet a need or to pursue collective goals. All organization have a management structure that determents relationship between the different activities and the members, and subdivides and assigns roles, responsibilities, and authority to carry out different tasks. Organization are open systems they effect and are effected by their environment" (Organization, 2014).

Users are the most pivotal and important factor in information system, they differentiate between the failure and success for most origination. Based on Stair & Reynolds (2011), we can define Information system user as "people who work with information systems to obtain results".

2.2.2 Information System Evaluation Purpose

As we know, organizations increased their spending on IT/IS and their budget continue to rise even in the situation of potential economic downturns (Kanaracus, 2008). However, fear about unstable condition of economic in countries especially least developed country and the increasing competition generate pressure to omit the evaluation and causes in cut the costs that is required by organization to evaluate and examine the benefits of technology in general. Organizations are interested in knowing the benefit or return of their investment in IS/IT for this purposes ISs success evaluation is important (Petter et al., 2008).

Organization spend huge amount of money for information systems and this is the main reason behind the interest in IS evaluation, in fact the necessity to ISs evaluation in general has emerged from the importance of IT/IS in the efficiency and effectiveness of processes in an organization (Balaban & Platiša, 2009).

We understand from Irani et al (2007), Information system assessment will assist the practitioners and the researchers understand the process associated in making decision of adopting technology in the modern organization. The conceptual and analytical models, case studies of information systems assessment and strategic frameworks were motivated and form the genesis of evaluation.

There is a hope that it will embolden the modern thoughts and researches in information systems assessment to be presented to a forum of leading business executives and information systems professionals. The IS evaluation will come up with a mixture of ideas, models and case study that will be encouraging and beneficial (Irani et al., 2007).

2.2.3 The Need for Information System Evaluation

By reviewing the available studies for instance, and not limited to information systems. "Assessment criteria based on attitudes of graduate students, Measuring information systems success models dimensions measures and interrelationship, The assessment of information systems success a new point of view , An evaluation of information system success a user perspective the case of Jordan telecom group, Information system success assessment past present and future, Interpreting the assessment of information systems investments conceptual and operational explorations, Information System success individual and organizational determinants, Information systems assessment a post dualist interpretation and etc..".

It is obvious to us that are, need for ISs assessment in general and ISs evaluation based on users' perspective is growing. This desertion is related to ISs, which are the organizational applications and its part of IT/IS.

IT relies on the delivery of the information needed by organization stockholders, IS concerned with the manner of an organization, as information becomes necessary in organization IS cannot be separated from human intellect, culture , structure of organization and philosophy, IT/IS cost decreased dramatically and the investment in these fields has been increased. This is evidence confirms that IS have become a necessary for organization in order to support the daily data processing, organization structure and initiatives for competitive advantages (Dařena, 2011; DeLone, 2003; Hafid Agourram 2006; Irani & Love, 2001; Irani & Love, 2008; Kanaracus, 2008; Moh'd Al-Adaileh, 2009; Petter et al., 2008; Sabherwal et al., 2006; Whittaker, 2001).

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2.3 Information System in the Context of Universities

Today's organizations are needed more than ever before is a powerful information system. The university is applying, developing and improving their information systems in order to optimize the processes within an organization and a lot of manual mode, be automatically. The largest changes occurred in different social systems, increasing pressure on universities to use information technology to improve student performance has been (Steenkamp & Basal, 2009).
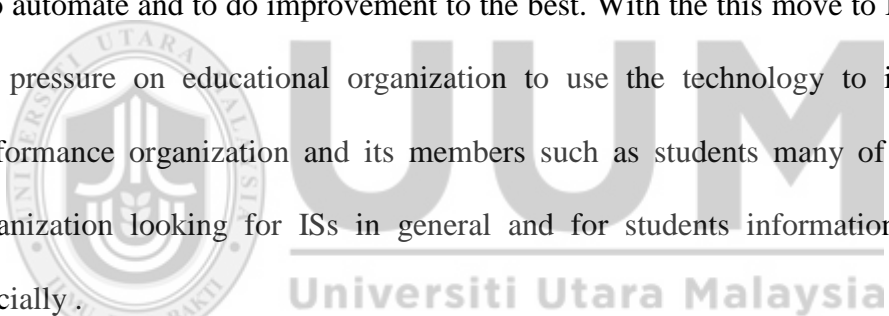
The creation and implementation of powerful information systems to increase the performance of student will be crucial in universities, leading to the formation of successful information systems (Rai, Lang, & Welker, 2002). Many universities are looking for an information management system as a way to enhance their students' performance (Powell, 2008).

Information systems developed and deployed a secure and convenient access to university student, presidents and other users to provide applications such as recording, retrieval and transfer. It is a means to collect all the information electronically to the students of the university. Including those provided however, the introduction of management information systems as a solution for some problems in the education sector could be helpful; however, one of the major challenges in embedded systems as well (Perks & Beveridge, 2003).

Evaluate the work of information systems in small and large universities have the same level of importance and the lack of integration of information systems at the university are many trouble (Rai et al., 2002).

This special issue stresses on Information Systems (IS) and calls for the success of information system assessment. ISs are a permanent contentious subject of discussion in Yemeni organizations but the number of studies focusing on evaluation Success information systems is almost non-existent (Baheshwan, 2014).

Depending on Steenkamp (2009), the need for adopt ISs to change manual process into automate and to do improvement to the best. With the this move to ISs and with the pressure on educational organization to use the technology to improve the performance organization and its members such as students many of educational organization looking for ISs in general and for students information system as specially .

By Refers to Özkan (2006), to get significant gains in performance and productivity, organization must adopt IT/IS that is because information technology and information system has the potential to solve problems effectively. In fact, weak performance of information system is a critical inhibitor to good organizational performance.

Chang and King (2005), confirmed that "increased IS effectiveness is associated with high organizational performance". Rapid growth regarding the interest as well as utilization of modern information systems and technology in educational

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organization, this interest has influenced the ways of communication among members of the organization and it growth the concern of educational organization about the necessity of ISs (Almarashdeh et al., 2010).

Governments give attention to development of talents in fulfilling the goals of development and one of the areas for development are universities. High quality workforce environment is pivotal for educational organization to make this sector world class (Davarpanah & Mohamed, 2013).

2.4 Information System Success

According to Hafid Agourram (2006), success of Information System (IS) and its determinants are considered very crucial in the study of information systems. Many attempts have been made to model IS success but its definition and measurement is still knotty despite many due to many reasons (DeLone, 2003; DeLone & McLean, 1992).

 (Kanellis, Lycett, & Paul, 1998) asserted the first reason as the mix of social and technical aspects of IS. IS success can be viewed as a concept that combines both technical and social aspects within the organizations. Secondly, work practices and information technology are so entangled in organizations that it is difficult to segregate their individual contribution to success.

According to Garrity and Sanders (1998), this is methodological perspective in measurement of IS success that makes it difficult to define thus making it more difficult to take IS success as dependent variable. IS success is an enigmatic concept that is dependent upon different IT types and stakeholders in practical world (Seddon et al., 1999). As claimed by Markus and Tanis (2000), there exists a clear gap between academic and practical definitions of IS due to lack of clarity and consensus.

As far as international dimension of Information System is concerned, it is even more complicated to define and measure IS because it incorporates heterogeneous cultural values and norms that may differ in definitions and interpretations of success of IS (Agourram & Ingham, 2007).

 (Agourram, 2009), states that people look, understand and interpret information based on their beliefs, values and expectations hence leading to creating different perceptions of same things. This raises a question that whether concepts and theories based on specific culture apply in similar fashion and have same meaning in other cultures as well. There is a consensus among researchers that the measurement of IS success is a difficult task. Major problems with current model of IS success is that it cannot be used by managers in practical as it is very abstract and lacks practical techniques and tools. Second problem with existing IS success model is that it is used independent of organizational and cultural differences.

Luftman emphasized on the organizational context of IS success model and have contributed a lot in existing body of knowledge regarding organizational strategies and IS success models. However, the national context of IS success models has always been neglected by the researchers.

Agourram (2007) concluded that IS success is defined and measured differently in different cultures in his study that involved Germany, France and Canada. Thus reaching to the result that IS success models conceptualized in one country or context cannot be applied as it is in other countries and context.

2.5 The Importance of Information System Success

Any organization can be best observed with its system of inputs, processing of inputs to produce output. Organizations add value to inputs in processing and hence enabling organizations in accomplishing its objectives. As far as profit organizations are concerned, their main objective is to reap high profits so it can be measured by deducting the cost of all inputs from the value of the output named as profit of that organization. The main role that is imperative for this transformation process is decision making function of the organization (Moh'd Al-Adaileh, 2009).

The whole process of purchasing/hiring of inputs, processing/transforming of inputs, the whole process and mechanism and the selling of outputs to the end users, involve decision-making hence making it very critical and decisions cannot be taken without information. That is where the importance of information system is realized in collection of required information for precise decision-making (Moh'd Al-Adaileh, 2009).

Laudon and Laudon (2004), asserted that there are many other important factors that show the significance of information system these days. These factors may include but not limited to, the transformation of business towards hi-tech enterprises, increased use of ICT and internet in businesses and globalization.

Seeking concrete evidence of the contribution of IS in making the success of the value organization starting by senior management and this getting from their IT/IS investment. Successfully IS out comes do not accord by default they are highly and in order to achieve the success of organization (Laudon & Laudon, 2004).

2.6 Evaluation Information System Success

Based on the findings of Hirschheim et al. Stockdale and Standing (2006), stated that there is an increasing trend in explanatory approach of information system assessment because this approach integrates both technical and social aspects of information system. If we treat the assessment of information system as a technical problem, then it will lead us to misleading conclusion of overlooking its social aspect that involves in the process of evaluation. Researchers also recognized the significance of stakeholders (Lincoln & Guba, 1989).

Organization at all continues to increase spending on information systems budgets (Gordon, 2012; Kanaracus, 2008). Organizations have relied on Information Systems to improve their performance, flexibility and competitiveness, they are yet facing difficulties of how IS can and should be effectively and efficiently evaluated {Irani et al., 2006; Irani & Love, 2000). Many IS practitioners do not evaluation of their IT/IS investments (Seddon, Graeser, & Willcocks, 2002).

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Rabaa'i (2012), report that there was interviews with seven organizations in Finland and Estonia, state that just three organization did system evaluation. According to (Ifinedo, 2006), lack of knowledge about IS evaluation is the reason behind why organization did not do IS evaluations. It is confirmed that by Rai et al., (2002) academics yet struggle as well as practitioners with how to evaluate IS success.

"A comprehensive understanding of IS success thus remains elusive" (Sabherwal et al., 2006). With the large IS investment, the mixed result of IS the increasing complexity of IS combined with unfulfilled expectation of the success evaluation of IS has become a critical issue (Petter et al., 2008).

2.7 Information System Evaluation Theories

The general comprehensive IS project success rate has increased from sixteen percent in one thousand nine hundred forty four to twenty percent in two thousand. Those are the factors that lead to increase significant, the executive support, the user involvement, manager who have experience in project, making the business objectives clear and minimized the scope. DM is the most cited model regards to IS success (J. Johnson et al., 2001).

Most scholars accept success as the main criterion to evaluate the information systems success. However, theorists are still trying to answer the inquiry of which structures are best able to demonstrate success in information systems? (Rai et al., 2002).

Although many models presented in context IS success but a large number of this model is based on DM model. Some of those models not clear, ambiguous and investigators do not know how the model can be successfully used this model to analyze information systems (Rai et al., 2002). On the other hand, DM model is one of the widely known IS models and presented based on a systematic review of 180 research which were tested over 100 success measures (Wu & Wang, 2006).

2.7.1 Glimpse on TAM and DeLone and McLean Theories

The explanation of (IS) or DM IS success model is that it is an information system theory making effort for the provision of complete understanding related to the success of IS with the help of recognizing, explaining and describing the association between six important success dimension and besides which the IS are usually observed and analyzed. The H. DeLone and Ephraim R. McLean in 1992 initially developed the theory and a decade later, the original authors refined in response to a feedback received from other scholars who worked in the area (DeLone, 1992; Vaidya, 2007; DeLone, 2003).

In various scientific papers, IS success model is studied and is considered important among the contemporary research done on IS. Considering both causal and process aspects, the six success dimensions are considered related rather than independent. In empirical studies, the implication of this is of utmost importance in the measurement, reporting and analysis of IS success. It is suggested in temporal process model that an IS is first developed including different features, which can be featured as presenting different level of qualities related to IS. Furthermore, when the system is used by users and managers, they will have satisfaction or dissatisfaction form the system. The system usage then influences the user when he or she conducts his/her work and further these individuals have influence on organizations (Vaidya, 2007).

The result is that the DM IS Success Model is reproduced. On the basis of changes in the management role of IS, and on the basis of research contribution, the original success model was updated by DM. as explained earlier, there are three main dimensions of quality that are: service quality, information quality, and system

quality. Every dimension must be separately measured, because individually, they influence "use" and "satisfaction of user". The multidimensional aspects of "use" have difficulties in interpretation effective versus ineffective, voluntary versus mandatory, informed versus uninformed and so on "intention to use" was suggested to be a better alternative in few cases. "use" is a behavior while "Intention to use" is considered an attitude (DeLone, 2003).

A few from causal VS process issues of Seddon (1997) can be resolved if the former is substituted with the later one. However, it is difficult to measure the attitudes and their relationship with behavior, thus, different studies will opt for "use" but with a more informed understanding of it. The inter-relationship of "user satisfaction" and "use" are closed as expressed in the original formulation of the DM Model. In a process sense, "user satisfaction" must be preceded by "use", but in causal sense, if a user receives positive experience from "use" it will definitely result in "user satisfaction". Similarly, if the user has increased "user Satisfaction" it will in turn lead to increase in "Intent to use" and therefore "use". Certain "net benefits" will occur because of this "Use" and "User satisfaction" (DeLone, 2003).

TAM (Technology Acceptance Model) is considered an information systems theory that helps in modeling the explanation of user's acceptance and use of technology. In this model, various factors are suggested that has an influence on decision related to the adaptability of new technology whenever it is presented to the users, which are: PU (Perceived Usefulness) Fred Davis defines PU as "the level of an individual's belief that his/her job performance will be enhanced with the use of a particular system". PEOU (Perceived Ease of Use) according to Fred Davis, the definition of

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PEOU is as "the belief of a person that the use of particular system will be effortless" (Davis, 1989).

There has been continuous study on TAM which has been the reason of integration from TAM to UTAUT (the Unified Theory of Acceptance and Use of Technology) (Venkatesh & Davis 2000; Venkatesh et al. 2003). In the e-commerce perspective, TAM is also suggested with an inclusion of perceived risk and trust influence on the usage of the system (Venkatesh & Bala 2008). In literature, TAM is considered among the most important integration of TRA (Theory of reasoned action) developed by Ajzen and Fishbein. Richard Bagozzi and Fred Davis are among the founders of TAM (Davis 1989, Bagozzi, Davis & Warshaw 1992).

With the two technology acceptance measures i.e. usefulness and ease of use, various attitude measure of TRA are being replaced by TAM. The behavioral elements of both TAM and TRA are considered very strong; assume an intention of someone to act, that they will have no limitation and will be free to act. In reality, there are many limitations like freedom of action (Bagozzi, Davis & Warshaw 1992).

According to Bagozzi, Davis and Warshaw, because of complexity and uncertainty regarding the adaptability and success of new technologies like PC (personal computer), people intent to learn and use the newly developed technologies prior to initiating efforts directed for use. Because of preliminary action for learning the use of evolved technology, attitude towards use or intent to use may be disorganized, may have no conviction or else.

Therefore, actual usage may not be directly influenced by intentions and attitudes like these (Bagozzi, Davis & Warshaw 1992). Previous studies, related to the diffusion of innovation, suggested important role for PEOU. The study of Tornatzky and Klein (Tornatzky & Klein 1982) made an analysis of the adaptability, and found that the factors like relative advantage, complexity and compatibility are having significant relationship with adaptability of a wider range of innovation types. The Eason used the terms "Task fit" for studying PU with respect to fit between job profiles and tasks quoted in (Stewart 1986). Legris, Ingham & Collerette (2003), made a suggestion of expansion in TAM with inclusion of variables for the process of changes and it can only be achieved if the innovation model is included in TAM.

2.7.2 DeLone and McLean Information Success Model 1992

DeLone & McLean created their model in 1992; it consists of six factors "system quality, information quality, services quality, use, user satisfaction, individual impact and organizational impact". In 2003 DM created their updated model, which is based on the past theories and studies of IS, in this model they show how that the success factors are not independent and are interrelated.

To meet the changes in the role of IS DM put their model in new design "system quality, information quality, services quality, use / intention to use, user satisfaction, and net benefit", "system quality, information quality and services quality" these factors must be separately controlled as they impact the "use / intention to use" and "user satisfaction" factors.

According to DM "use" viewed as a behavior and "intention to use" viewed as attitude also dimensions "use" and "user satisfaction" are interrelated and if the dimension "use" has positive experience it will correlated with user satisfaction. Net benefit increase by the "use" and "user satisfaction" factors (Limtrairut, 2012).

Pai and Huang (2011), stated that DeLone & McLean multidimensional IS success model which mixes the model of communication developed by Shannon and Weaver, and the theory of information influence stated by Mason suggested six correlated variables to measure the success of IS including: "system quality, information quality, system's use, user Satisfaction, organizational impact, and individual impact".

DeLone & McLean put forward an interactive and taxonomy model to conceptualize and operationalize the success factors in the model of information systems; six components of information systems success were suggested: information quality, system quality, user satisfaction, use, individual impact and organizational impact. See figure 2.1
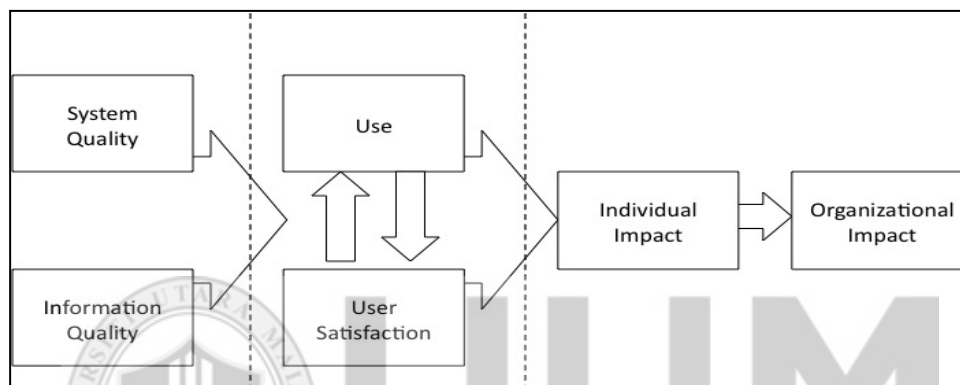
Figure 2.1. Information System Success Model (DeLone & McLean 1992)

This model is published in one thousand nine hundred ninety two, shortly after published researchers in the field of information systems suggest an amend for this model. Seddon and Kiew reformulated it by replacing the term "use" with "usefulness". They said that "use" is a suitable measure of success in the voluntary systems but "usefulness" can be alternative measure in the use of systems that are compulsory.

2.7.3 DeLone and McLean Information System Updated Success Model 2003

DeLone & McLean adding new dimensions "service quality" and "net benefit" to improve their model. "individual influence" and "organizational impact" combined and merged into a new aspect, "net benefits". See figure 2.2
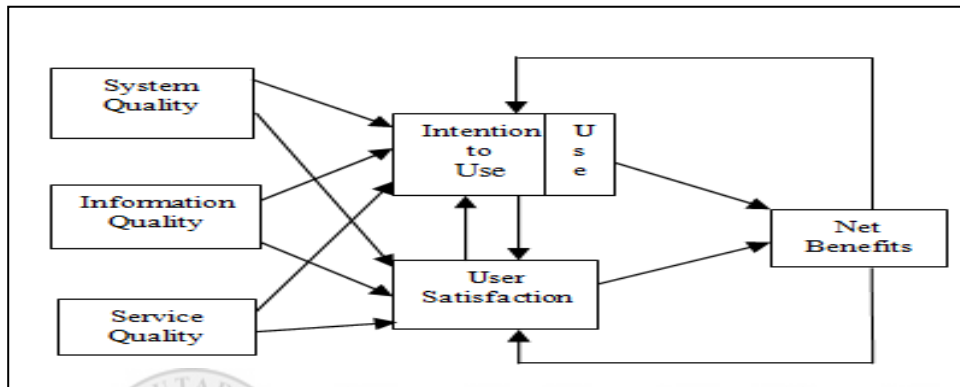
Figure 2.2. Information System Success Model (DeLone & McLean 2003)

The 2003 model of DeLone & McLean offered an updated information system success model was to assess its usefulness in the way of the great changes in information system practice and E-Commerce growth (Ramayah, Ahmad, & Lo, 2010). DeLone & McLean argued that there is variability in the term of "use" in the systems that are compulsory as well. Recognizing the importance of "service quality", Pitt et al., 1995 recommended the incorporation of "ServQual" adopted from marketing literature to measure the quality of users' anticipation against their perceptions of the departments of information systems. Resistance to the modification is showed by some of researchers in other hand other researches advocated it (Moh'd Al-Adaileh, 2009).

DM updated model of IS success contains arrows to demonstrate the suggested relations among the success factors in a process sense, but in a causal sense it does not show any sign either positive or negative because these casual relations hypothesized based on studies context. As an example, use of a poor quality system would be relate negative net benefit and the relation sure will be negative, in other hand use of a good quality system will relate with more use and high perception of user satisfaction and will lead to a positive net benefit and the relation will be positive (DeLone & William, 2003).

Net benefit with the others (services quality, use, the satisfaction of the users, information quality and system quality) are the interrelated dimension of success. DM model has arrows explain the suggested success factors relation. The DM updated model can be illustrated as follows: An evaluation for the system can be in terms of the quality of the information, the quality of system, and last the quality of the service, these factors affect the system usage and affect the user perception and this in turn will lead to achieve a benefit (Petter et al., 2008).

Factors of the DM update model can be illustrated based on Petter et al (2008), as follows:

1.   System Quality: This describing the IS features. For example: ease of use the IS, the accessibility of the IS, as well as sophistication, and response times of the IS.

2.   Information quality: The features of the IS output like: accuracy, understandability, timeliness and completeness.

3.   Service Quality: Refers to integrity, the reliability and empathy of technical support personnel that users received.

4.   System Use: Explain the degree and manner in which users using the IS such as ease of use and the actual use of the IS.

5.   Users Satisfaction: Which refers to the users level of fulfilment with the IS as example: the overall satisfaction with the IS reports.

6.   Net benefits: It indicates the success contribution of IS to the individual or organization as an example improver the decision-making.

The models for IS success presented by DM (1992) and Seddon (1997) was assessed theoretically and empirically by Rai (2002) and the results gotten supported the work of DeLone & McLean (1992) and also Seddon (1997) where their work focused on integrated models for IS success, and construction of three categories the quality of the system and the information quality, general perceptual measures on the benefits of the use of IS, and the behaviour of IS respectively. In future study, DeLone (2003) further revealed that the quality of IS comprises of three major dimensions which includes, quality of information, system and service. These dimensions should be individually measured or controlled which will have a corresponding effect on the satisfaction of users and use. However, the major difference of the original model DM, 1992 from the updated model DM, 2003 is that, quality of services were added with the aim of reflecting how important service and support in a success of e-commerce information system is.

A three-dimensional model aimed at evaluating virtual business environments based on user's perception, this including the functionality, doing the process of evaluation for the services offered profile; reliability, investigating the security of the transactional site's and usability of these sites, evaluating the quality of interaction between the user and the site (Diniz, Porto, & Adachi, 2005).

The key subject for experts and researcher is effective measurement of the information systems success. It is of utmost importance to measure the success in order to reach to the point of understanding on value of IS investments and IS management actions (DeLone, 1992; DeLone, 2003). However, the IS success can be measured at various levels as it is a multi-dimensional concept. Moreover, the

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opinion of different stakeholders, regarding the success of same IS, will be different. For example, managers will prefer increase in revenues earned from the IS usage, technical success will be preferred by product developers, and ease of use will be the preference of end-users. Literature shows different IS success measure in various studies, and thus, different studies and systems cannot be compared (DeLone, 1992).

A comprehensive and multidimensional IS success model was introduced by DeLone and McLean for the purpose of more integrated view of the IS success concept and to organize diverse research (DeLone, 1992).

This model provides a framework for the measurement of IS research's dependent variables. Different studies like (Shannon and Weaver, 1949), (Mason, 1978) and empirical MIS (Management Information System) studies from 1981-1987 created sic different categories of IS success: information quality, individual impact, use, system quality, user satisfaction and organizational impact. Previously, all empirical studies were reviewed which have made some effort in measuring MIS success in seven different publications (communication of the ACM, MIS Quarterly, Information & Management, Management Science, ICIS Proceedings and Journal of MIS). For making extension in the contribution to conceptual and theoretical issues, various articles were included. The sum of the articles referenced in the paper is 180 (Hellsten& Markova, 2006).

The IS success model of DeLone and McLean examined six dimensions at three different levels: effectiveness or influence level, semantic level, and technical level. System quality of the model studies the technical level success. The desire feature of

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IS itself is considered in this which produces the information. Information quality is the second dimension which has focus on information product and, at semantic level, characteristics is focused i.e. "success in conveying the intended meaning".

The original IS success model needed further confirmation, DM proposed an updated model in 2003, again based on the past researches (Hellsten & Markova, 2006). They added the quality of service (e.g., information system support) as one vital dimension. Intention to use the information system have been added as an alternative measure. They made a combination for the impacts of individual and organizational in one dimension and they called net benefit (Hellsten & Markova, 2006).

2.7.4 Seddon Model

Seddon suggested a model, which includes: "system quality, information quality, perceived usefulness, user satisfaction, and IS use". A comprehensive review of different ISs success measures has been done by DeLone and McLean conclude with model with six categories of ISs success but this model lead to many confusing meaning that make the model value is diminished (Seddon, 1997).

Seddon (1997) argues that model of DM is too wide and somewhat ambiguous, since the hybrid model of causal explanation of the process a success. He noted that DM model may have different meanings (Seddon, 1997). He therefore recommended that the behavioral model of information systems as opposed to a representation of the process should be used to attract interest because it affects the individual or organization. It can offer an alternative to the variance of causal relationships among classes is categorized (Seddon, 1997).

He showed and vindicated a re-specified great version of DeLone & McLean model by splitting the DeLone & McLean model into two variant sub models of use and success and excluding the process model elucidation (Gorla, Somers, & Wong, 2010). But this model is not clear, and investigators do not know how the model can be successfully used this model to analyze information systems (Rai et al., 2002).

Seddon did an effort to retain much possible of the meanings in DeLone and McLean model, he also did his effort to avoid the slippage in the meaning that can accrue when one work with the existing model of DM so Seddon provided to us a model of information system success which is redrawn from the DM model.
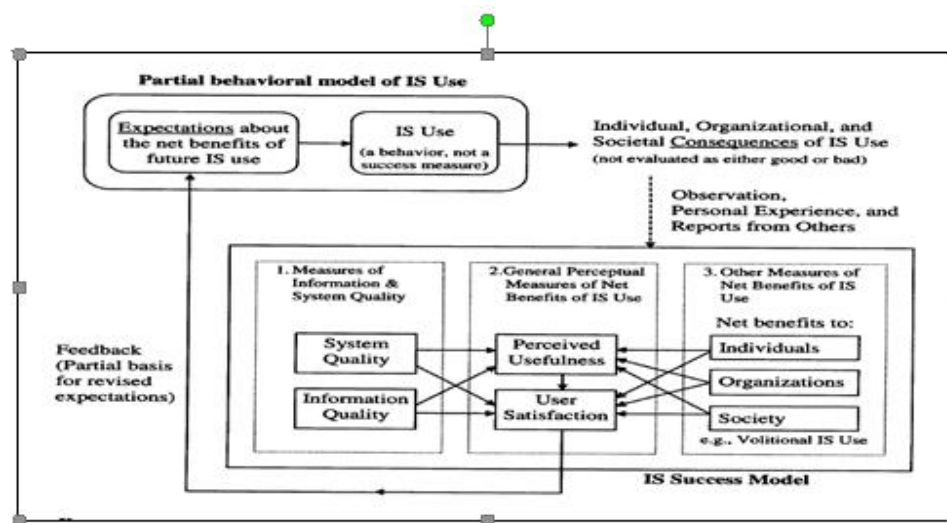
Figure 2.3. Seddon Information System Success Model (1997)

Chen (2012) in their study applied adjust Seddon model, they constructed based on the model for practical explaining of the impact of learning motivation in employees' eLearning training. Results showed that this clarification can help smooth an organization's human capital management (Chen and Kao 2012). Seddon et al, .1999, anticipated a matrix consists from two dimensional for the purpose of classification the measure of effectiveness of IS. The first one make consideration for the studied system type while the second one take interests of stakeholders as a consideration.

The two-dimensional matrix was put to test using classified measure for IS effectiveness culled from 186 empirical papers published in three major IS journals. From the results, there was an indication that the classifications hold viable meaning, but the study did not present the details of both the effectiveness of the IS effectiveness and the interests of the stakeholders'. Hence, this shortcoming

undermines the usability of the results of the research for the measurement of IS success.

2.7.5 Technology Acceptance Model

Information technology area, Technology Acceptance Model (TAM) is known to be a model held in high regard for IT/IS adoption that has been tuned to illustrate computer usage (Moh'd Al-Adaileh ,2009). Some of the characteristics of the Technology Acceptance Model include the usefulness perceived and ease of system use, specifying the casual relationships amongst the features of the system design, the frame of mind toward using and actual behavior displayed during usage. Another main application of TAM is to observe the actual system usage and then state a clarification on the effect of the characteristics of the system characteristics and behavior of the end user. See figure 2.4
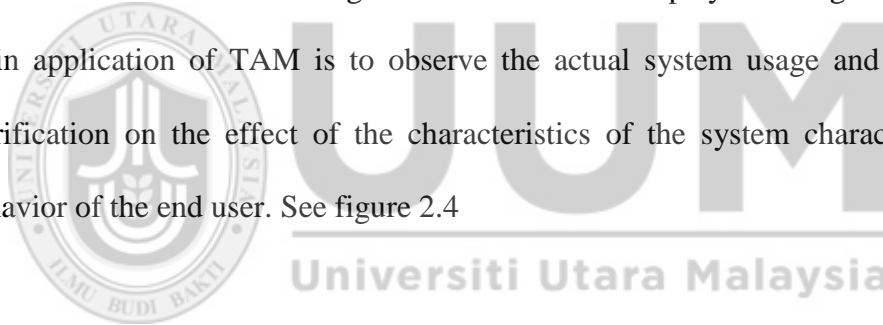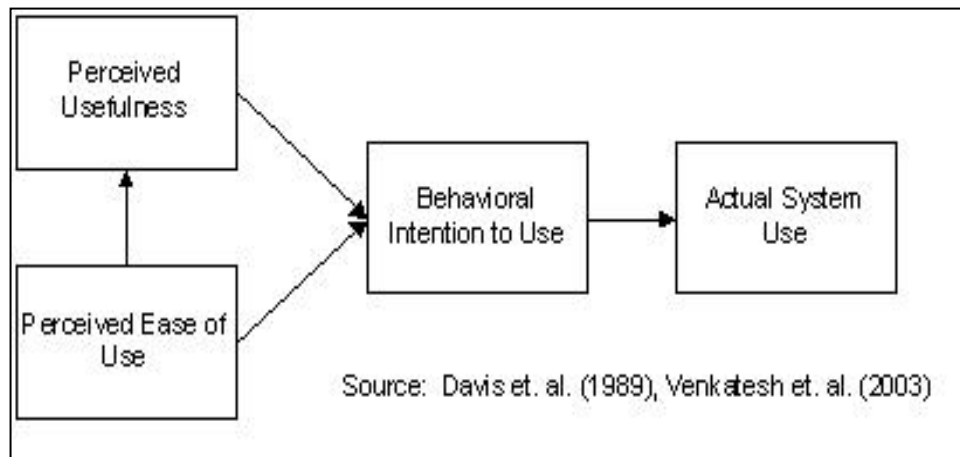
Figure 2.4. TAM of Davis

Moh'd Al-Adaileh (2009) wrote a review for the work of Winter (1998) and in this review, it was stated that irrespective of the effect on the response, or the formulation of the cognitive response, personal characteristics are not obvious. By laying emphasis on the role of perceived usefulness, TAM takes the assumption that there exists rationality in the human behaviour. However, this assumption might hold in a situation where people hold a certain level of professionalism, which aids their realization and ability to assess the target system benefits, whereas, people who fail to possess sufficient acquaintance to enable them realize the advantages of the system may end up only being interested by the system ease of use.

It is worth taking note of that the level of emphasis laid on how attitudes and behaviour are related, tends to disregard an important factor that states that in a situation where people cannot exercise the freedom to act in whatsoever attitude they wish, there will not exist a relationship between attitude and behaviour. The Technology Acceptance Model (TAM) proposed in 1989 by Davis, was investigated

by Behrens, Jamieson, Jones, & Cranston (2005) with the aim of providing a better holistic account on the reason(s) why a given IS, an online system for assignment submission, records a high level of success rate.

The results presented by Behrens et al (2005) showed that effective predictors of IS success includes the Technology Acceptance Model measures the perceived of usefulness ease of use. However, in the work of Elpez & Fink (2006), the authors considered a large range of factors and placed them in order of importance with the aim of identifying key IS success factors that has relevance to the public sector. The factors placed in order of importance, were given as follows: meeting the requirements of the user, the usability and performance of the system, the quality and use of information, user acceptance and IS ownership and the interactions with the remaining IT structure.

In 2005, Wixom & Todd developed a model that make distinguishing between object-based beliefs and attitudes, and behavioural beliefs and attitude. That is the model aims at showing the difference between the beliefs and attitudes about the system, in comparison to the beliefs and attitudes when system is using. The general idea is to present a theoretical logic that shows the link between the satisfaction of user and acceptance of technology.

The proposed model as shown in Figure 4, displayed foundational evidence that there can be an integration of both perspectives and hence should be combined. This integrated model, bridges the cavity between the characteristics of the system (the central strength of the literature on the satisfaction of the user) and the usage

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prediction (the central strength of the literature on the acceptance of technology). See

figure 2.5
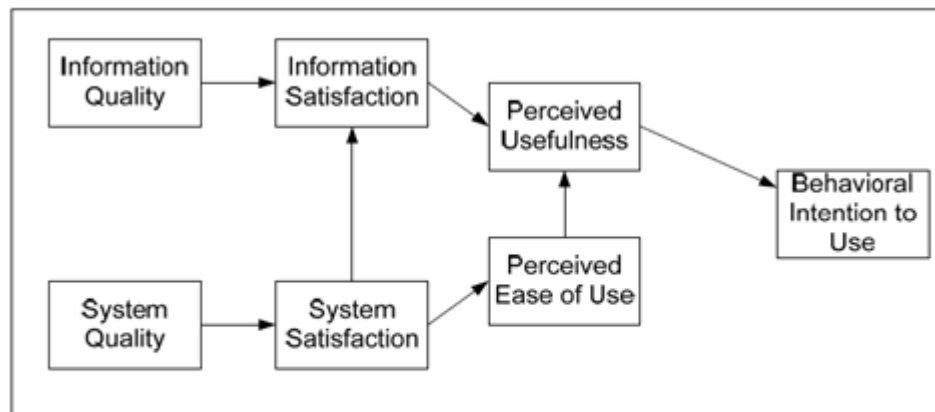
Figure 2.5. Integrating System Characteristics to TAM, (Wixon & Todd 2005)

A re-examination of the issue of the assessment of IS was conducted, putting into

consideration the recent developments in the field (Smithson & Hirschheim, 1998).

In this work, it was argued that the evaluation of IS is a 'necessary evil' but the

context for the development and usage of IS has grown to be very demanding and

quite complex.

2.8 Related Work

In this section we explorer some of the previous work that related to the models of IS success, either based on DM IS success models or Seddon model.

Rai et al. in 2002 conducted an empirical and theoretical test on the model proposed by DeLone & McLean, and also the model by Seddon. One characteristic common to the two models is that they both relate to IS success, although the model by Seddon does not consider the use of IS as a process but rather as a behavior. Whereas, the initial model by DeLone and McLean views it as a process that leads to organizational or individual impact. The model by Seddon concentrates on the fundamental areas of the taxonomic category's interrelationship. The work by Rai et al stated that the major thing that makes these two models differ exists in the IS use placement and definition.

However, Seddon states that usage precedes benefits and impact, although it is not responsible for the cause. The author further considered the use of IS to be a resultant behavior reflecting the expected net benefits gained from adopting the information system. Additional information regarding the empirical test Rai et al conducted is further explained later. In addition, different researches who have adopted these models is presented next (Rai, 2002).

DM adopted their upgraded model to compose the accomplishment figures of e-commerce mentioned in previously existing studies and exhibited how the model can be adopted by considering two example cases. These two cases described usability as a vital measurement for System Quality prompting expanded times for

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access in websites (use) and purchases repeated (user satisfaction). To add to their work, the authors further recommended that e-commerce studies ought to incorporate net benefits measures (such as, market valuation, incremental deals) and not be limited to the collection of surrogate measures, for example, hits on website (use). Then again, to comprehend the results of net benefits, they contended that the user's experience quality and the usage by customers of, and being satisfied with, the system ought to be measured (Delone & Mclean, 2004).

Rai et al. conducted an empirical test in quasi-voluntary use of IS with application in student information system. Student information system (SIS) make the access to the database of academic and personal data of students online. The adoption of SIS was not compulsory. The discoveries provision DM perception that the success of IS models must be deliberately determined in a given area. They additionally propose that future study ought to inspect how "performance of IS success models in distinctive areas, including settings that differ from strictly voluntary to strictly involuntary use, and prescribe refinements as fitting" (Rai, 2002).

Iivari tried the DM IS success model by utilizing field investigation of a compulsory data system. The test was led with Oulu City Council. The council was working on the selection of a new data system and attempting to perform its acknowledgement organizationally. Iivari gathered information by adopting questionnaire approach that was offered to new data system's basic users.

The survey administered took into account the criterion measures. Language, flexibility of the system, time for response, the integration of the system, recovery of

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error and access convenience those are the factor to measure the quality of the system (Iivari, 2005).

Information quality was likewise measured by those factors: the output format, reliability, precision, completeness, accuracy and currency. The outcomes demonstrated that apparent the quality of system and information perceived were noteworthy indicators of user fulfillment or gratification with the system, however they did not matter to the use of the system. User fulfillment was a solid indicator of individual effect. A contribution to IS success research done by developing and empirically examining of a procedure arranged model of IS success that took into account the model of DM (Byrd, Thrasher, Lang, & Davidson, 2006).

Byrd et al., 2006 analyzed the impact of low-level immaterial IS and information technology (IT) advantages on high-level monetary measures. They likewise presented IS quality plan as a predecessor to the model's variables inputted. The outcomes of the test supported a procedure arranged perspective of the advantages from the IS and demonstrated how the impacts of IS along a way can prompt better performance organizationally, for their situation, lower general expenses. Standard measures are presented in this study's appendix. Their study was based on the Likert scale 7 levels arranged from strongly disagree to strongly agree.

Wu and Wang stated and experimentally evaluated a knowledge management systems (KMS) success model. Construct with respect to an investigation of current approach of knowledge management and in addition the DeLone and McLean's model where five subordinate variables were used (quality of the system,

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perceived KMS benefits, quality of knowledge or information, use of system and satisfaction of user) in assessing KMS success. The meanings and success measures are introduced (Wu and Wang, 2006).

2.8.1 Raid Mohammed Al-Adaileh Model

Moh'd Al-Adaileh reviewed papers in journals and create a conceptual model. Five factors suggested by Al-Adaileh to vindicate users' perspective for the success of IS. He stated that among five factors only four are just four influential factors are determined and those are "management support, technical capabilities, information quality and usefulness", he excludes "ease of use" from his model. Raid test his model and improve that management support factor play a vital role in IS success evaluation and it is affect the use and users' satisfaction. He encourage testing the management support factor in other studies in the Arab context. See figure 2.6
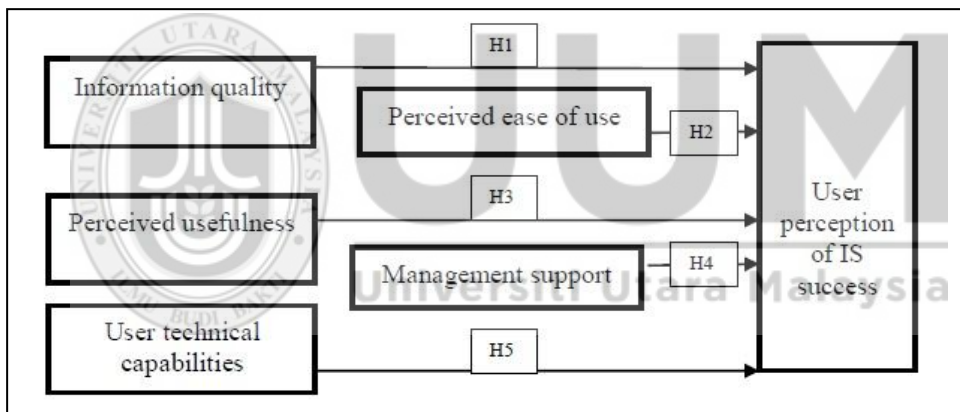
Figure 2.6. Raid Al-Adaileh Information System Success Model

2.8.2 Imran Khan Azeemi Model

Another model introduced by Imran Khan Azeemi et al. they revised papers from 1992-2012 in journals and create a holistic Conceptual Model. They stated that the previous models for measuring success of information system were either focused on information system context or information system characteristics, so those models give a partial sight of a whole system (Azeemi, Lewis, & Tryfonas, 2013). The context dynamic nature in the cloud needs an overall method to deal and well understand system as whole and supplemental metrics to evaluate achievement like policy propagation and dynamic costing to ensure the integration of the service etc. See figure 2.7
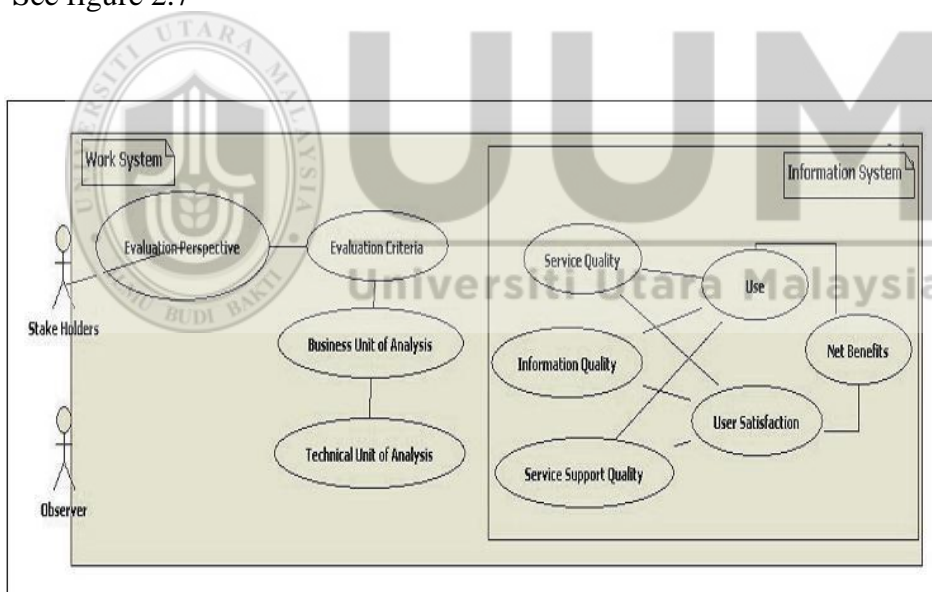
Figure 2.7. Imran Khan Azeemi et al Model

Azemi, used the DM updated model in his study and conclude that DM 2003 factors play an important role in success determinant in the cloud context and there is a significant affect among those success factors.

2.8.3 Fatemeh Dadmand Model

Fatemah, published a work "Evaluating information system success in university: an empirical test of the DeLone-Mclean model" and from her reviewed for the previous studies she based on DM model of success. She finds a positive relationship between system quality and use and she also suggested some suggestion to improve the quality and these suggestions are correction of system errors and reduce programming errors. Fatemah, conclude that system and information quality affect the use and users' satisfaction significantly in the university context. See figure 2.8
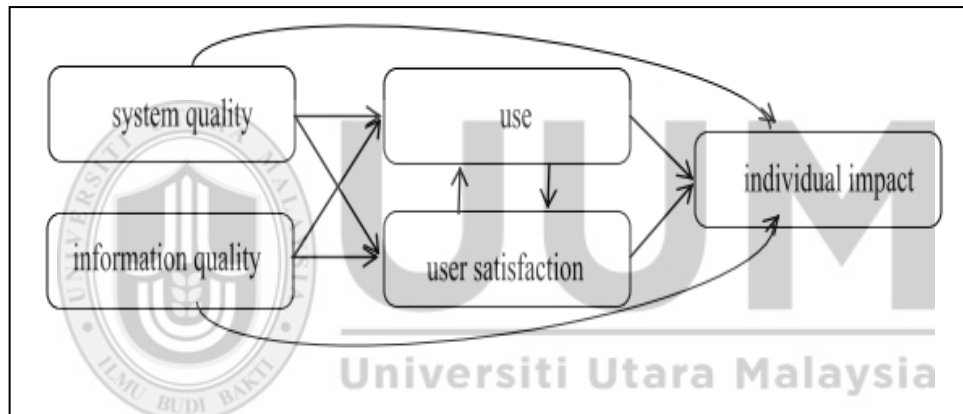
Figure 2.8. Fatemeh Dadmand Model

2.8.4 KMS Model

Wu & Wang proposed a KMS model through analysis and review IS success previous studies they used five factors which are "system quality, knowledge / information quality, use, user satisfaction and perceived KMS benefits" and the result that they found provided an expanded understanding of the factors that evaluate the success. They conclude that DM framework is great one to be used to evaluate the success and also they introduce the "knowledge / information quality" as a KMS success measure they also developed new measures "knowledge / information quality" and "system use" in the context of KMS and also their result provided a considerable support for the DM model. See figure 2.9

Fig. 3. KMS success model.
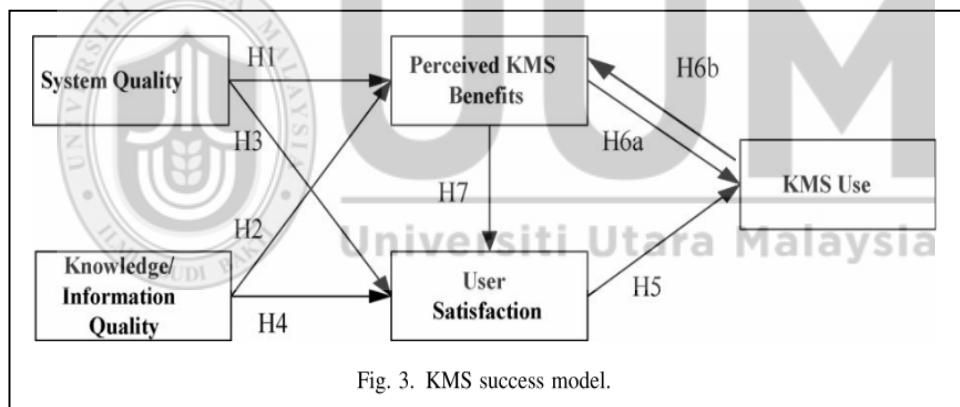
Figure 2.9. KMS Model

The Researchers decided to use the DM updated model. Reason behind that numerous research has been conducted based on DM updated model and many studies encourage this model for the future studies also it is widely known used model finally it is provided several important factors in IS meet to research aims.

2.8.5 Sabine Dernbecher DaaS Model

Based on DM 2003 updated model Sabine Dernbecher, developed his research model for DaaS use in governmental agencies to avoid artificial inherence of quality in use or user satisfaction, all three dimensions of quality need to be measured separately from each other as well as from use and user satisfaction. Based on his result he conclude that information services and system quality significantly affect the use and users satisfaction. Use significant affect the user's satisfaction and net benefit also user's satisfaction significant affect the use and net benefit of DaaS. See figure 2.10
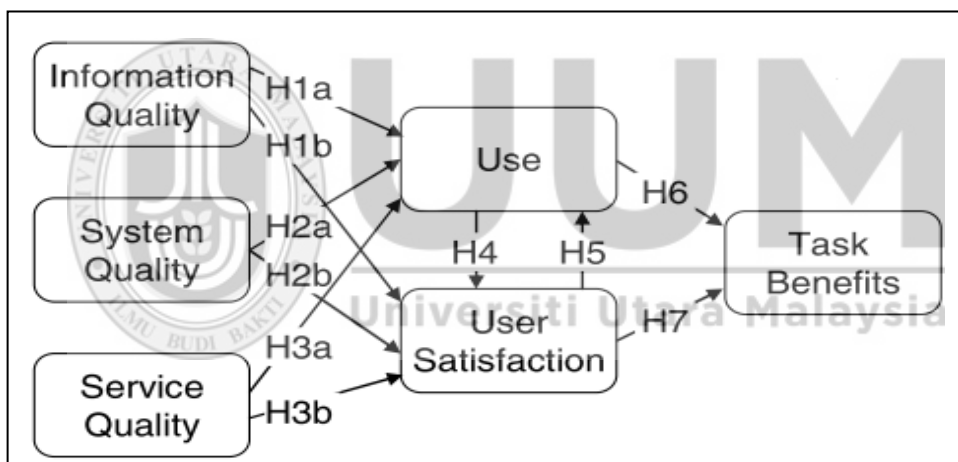
Figure 2.10. Sabine Dernbecher DaaS Adopted Model

2.8.6 Rouibah, Hamdy and Z. Al-Enezi Model

Rouibah, Hamdy and Al-Enezi, provides theoretical ground of their study which is motivated by the extension of TAM (Adamson and Shine, 2003), motivational model of PC usage (Igbaria et al., 1995; 1997), and information system success (Lee et al., 2009). The model investigates the relationship between seven variables. These variables were included based on a review of past IS/IT

literature in the West as well as the characteristics of Arab culture. The important factors are management support (e.g. Kim and Kim, 2008); availability of training (e.g. Mahmood et al., 2000; Gallivan et al., 2005); and user involvement (Mahmood et al., 2000; Petter, 2008). They conclude that all the factor that has been tested special management support directly affect the users' satisfaction. See figure 2.11
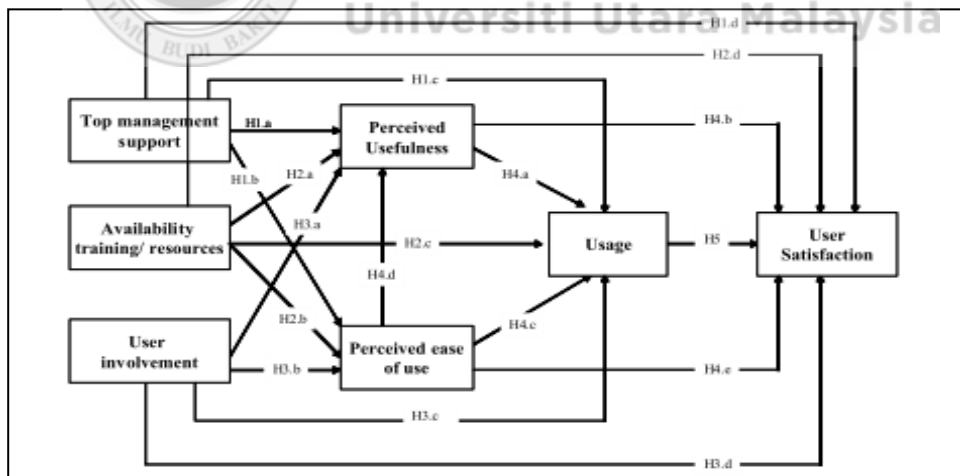
Figure 2.11. Rouibah, Hamdy and Al-Enezi Model

2.9 Glance about the case study and Arab Region Related Studies

In this section we explorer information about the case study Hadramout University, Yemen Center, Yemen and Arab culture and related IS studies in the Arab region.

2.9.1 Hadramout University, Yemen center and Yemen

As per International Monetary Fund (IMF), Yemen is the poorest country in Middle East as she has been suffering with domestic turbulence and political instability since 2011. The philanthropic requirements of the people of Yemen have raised especially for most poor and needy that includes refugees and "asylum seekers". Yemen initiated a 'National Dialogue Process' in order to draft its new constitution and for the preparation of election and referendum in March 2013. Due to problematic economic, social and political situation in the country, the result of national dialogue process remained uncertain and unstable security condition (UNDP, 2013; UNHCR, 2013)

The Yemen Center for Information Technology in Higher Education (YCIT-HE) was established in order to raise the level of higher education in Yemen and to utilize Information and Communication Technology (ICT) services. With the application of ICT services, scientific research and higher education in Yemen will be elevated. In spite of increasing donors and partners of YCIT-HE project, Dutch partners represented by "Netherland's Organization for International Cooperation in Higher Education (Nufficand Delft University of Technology TUDelft)" played major role in the establishment of YCIT-HE. Ministry of higher education of Yemen and Dutch experts collaborated for the establishments of a foundation that aims to familiarize

ICT services in various institutions of higher education in Yemen. Thus, YCIT-HE is a shared project between universities of Yemen and the ministry and the focus of this project was to promote higher education in Yemen. This can be made possible by collective cooperation among various universities in Yemen in sharing advanced ICT services. This type of cooperation and collaboration will surely result into improved efficiency with reduced cost and even more reliable services management (YCIT, 2010).

Yemen Higher Education Management Information system (YHEMIS) is an integrated application that considered as primary central applications for student information, it allow the administrator to manage the students information from registration to graduate like (students details, marks, status, etc.) and it is allow students to register and deal within the related details of the study (YCIT, 2010).

Hadramout University of Science and Technology, was established in Hadramout as an official University in 1996. Hadramout University of Science and Technology is the greatest scientific accomplishment to Hadramout governorate throughout its scientific history. It was a distance dream to achieve whom no one was allowed to talk about during the former Totalitarian Rule, and was a dream locked in the imagination, remained that way until the achievement of the blessed Yemeni Unity which unleashed the dreams for every freeman aimed at the development of the country and raising it to catch up with civilization and reach the developed countries With a full awareness by Ali Abdullah Saleh president of the Republic of Yemen (HUST, 2014).

For the position of Hadramout scientifically and culturally as well as in the renaissance and the promising future, which awaits Hadramout, the Presidential Decree issued no. (45) for the year 1993 carries the good news not only for the people of Hadramout alone, but for all Yemeni citizens, the good news of establishing Hadramout University of Science and Technology as a public university with a complete independence the same like other universities in Yemen. President Ali Abdullah Saleh made the Presidential Decree No. (150) appointing Prof. Ali Hood Baabbad as a chancellor of University of Hadramout in October 1995.

For the first time within the blessed unity, it witnessed the opening of Hadramout University, with a great honor to this university as well as to the Governorate that the previous president Ali Abdullah Saleh, made the official opening on eighth of February 1996 to begin the first steps in marching to the science and development, and the first college-opened was the College of Engineering and Petroleum, and from the first day of its establishment; the university granted plenty of support from both the citizens and the local authority (HUST, 2014).

The government was supportive by providing the appropriate financial support for the University to consolidate its base and to lead its scientific activity, and allocates in the first budget in 1996, which is about a quarter billion Yemeni Riyals. The University of Hadramout enjoyed the favor and support of the president/ Ali Abdullah Saleh as well as the concern of all characters in the state and the government, it was also visited by the Brother / Abed Rabbo Mansour Hadi, the Vice President and the Brother, Shekh Abdullah bin Husein AlAhmar the house speaker,

and Brother, Dr. AbdulKarim AlIryani, the Prime Minister, and Brother Abdul Aziz Abdul Ghani the Chairman of the Advisory Board, and Mr.AbdulQader BaJammal, The Deputy Prime Minister and Foreign Minister, Chairman of the Board of Trustees of Hadramout University, and the ministers of education, health, planning, development and expatriates Affairs and other official personalities and social development (HUST, 2014).

Hadramout University of Science and Technology was established to achieve a number of objectives which together constitute a qualitative step towards the rehabilitation of infrastructure and upgrading our homeland to high levels of scientific, putting it in the ranks of the advanced countries. These goals are:

1. The rehabilitation of the personnel scientifically in the latest undergraduate majors with an outstanding education along with offering the contemporary university education.

2. Paying more attention to the positive aspects of science and technology and taking advantage of it in resolving the issues of environment and development process of the Yemeni society.

3. The combination between the theoretical knowledge and the applied science and training so as to ensure that the graduates have the elements of technological development and scientific progress, especially in the field of computer and electronics, manufacturing, oil, fish, environment, the domestic economy and kindergartens.

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4.   Finding modern scientific centers to conduct scientific researches in the field of science and technology, directed to community service and developmental plans.

5.   Contributing to accommodate in absorption of the children of Yemeni expatriates and to ease the economic burden from their beloved ones.

6.   Strengthen the scientific and cultural ties with other universities, in order to develop and strengthen its scientific goals

7.   Achieving high ranks at the national level in the education and development of science and technology transfer

8.   Achieving quality standards and accreditation programs for the university

9.   Complete the academic competencies excellence in all academic sections.

10.   Reaching the scientific publishing internationally approved levels.

11.   To be privileged in the areas of Oil and Science Marine Biology and bees and palm trees and medicinal plants and mud architecture.

12.   Completing the university campus.

2.9.2 Related Information Studies in the Arab region

In Arab, the IS success related literature point out an abundant number of empirical studies on acceptance of IS/IT, consider the literature of Rouibah (2009). However, the IS usage related cause and consequence are investigated in a few studies. According to Rouibah, Hamdy, & Al-Enezi, 2009, the study of Khalil and Elkordy (1999), in Egypt, investigated the relationship between satisfaction of end user and Use: however, external factors were not included in their studies. The influence of organizational actions (management support), in Kuwait, on satisfaction of end user via attitude was studied by Aladwani (2002).

In Saudi Arabia, The influence of organizational, individual and technological factors on the use of PC and end-user satisfaction was studied by Al-Gahtani (2004). The study of Al-Gahtani (2004) excluded user involvement and included the availability of training and organizational support. In the Arab world, the study provided significant information on the use of IT/IS and the simultaneous influence of different path between the variables studies was not a matter of concerns. The Arab region includes strong collectivist, tribal and patriarchal strand.

Thus, in western culture, the support of management is of utmost importance because of the absence of Strand like these (Rouibah, 2009).

2.10 Dimension of Information System Success

In this section we explorer all success dimension related to our research

2.10.1 Information Quality

As per Information quality can be defined as the necessary property the information produced by the IS exhibits. During the process of taking the measurement of the satisfaction of the end-user, information quality is most times a very important variable. As a result of this, it is most times seen as a factor of user satisfaction instead of being seen as a rare construct (Petter et al. 2008). Edlund & Lövquist, 2012 repotted based on Allwood, 1999, the information quality produced by the IS determines the level of satisfaction of the users who make use of IS in solving their obligations, however if the information produced by the system is difficult to comprehend or possess a low level of accuracy, a frustrated reaction might be triggered from the users.

Bharati and Berg (2005) stated that based on how important information quality is, there has been a lot of discussion about it from IS scholars. A number of the widely grounded attributes of information quality includes, the outline of the information, preciseness in accuracy, ability to be relevant, completeness and timeliness (Petter et al, 2008). Preciseness in accuracy is a vital aspect of information quality. This is as a result of information quality being seen as the yardstick to judge how correct the information provided by the IS is and also investigates user satisfaction to how accurate the information is. Likewise, completeness of information is also quite important because it displays how detailed the information provided by the system is

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(Bailey and Pearson 1983). Also, the importance of information relevance is quite germane. This is due to the fact that it serves as a yardstick for measuring if there is equality between the information the system provides and the needs or requirements of the users (Bailey and Pearson 1983; Rai et al. 2002).

The way at which updated users view or perceive the information the system provides is reflected by timeliness, where the users tend to perceive if the information is relevant or not (Bailey & Pearson, 1983; Doll & Torkzadeh, 1988). It is also worth noting that the output format is also a vital aspect of information quality. This is as a result of the insight it provides on how users view the information the IS provides, to see if it is presented in a descent way which is understandable, or otherwise (Bailey & Pearson, 1983).

2.10.2 System Quality

System Quality can be defined as the general performance of the information system (Bharati and Chaudhury 2004). Another definition for system quality can be given as the preferred attributes of the information system with the aim of producing information that should be made use of by decision makers and users (DeLone & McLean, 1992).

With reference to the work of Petter et al. (2008), the vital attributes of system quality includes flexibility of the system, ease of learning and ease of use. Ease of learning and ease of use can be defined as the level that the usage and learning of the system by the user will be seen to come with little or no stress, that is, the process is effortless. This attribute is a very vital aspect of information quality since effort can

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be perceived as a limited resource which people can decide to make allocation for as they deem fit. As a result of this, IS which are seen to come with little or no stress by the users has a higher percentage of acceptability by the users (Davis, 1989; Rivard et al., 1997). In addition, ease of use enhances the level of efficiency of the users' use of the IS (Doll and Torkzadeh 1988).

Another vital component that a vast number of researchers have adopted as an attribute of system quality is flexibility (Miller & Doyle, 1987; Rivard et al., 1997; Bharati & Chaudhury, 2004). A system's flexibility can be defined as ability for alterations to be made in the system in situations where new circumstances or conditions arise, or new demands needs to be met (Bailey & Pearson, 1983; Wixom & Watson, 2001).

2.10.3 Service Quality

In the modified model presented by DeLone and McLean, service quality was included to the "quality" measurements in the first model (DeLone & McLean, 2003). Service quality is merged as a measurement of information system achievement, taking into consideration the significance of information system support, particularly in the e-commerce sector where service of clients is vital (Chung & Skibniewski, 2007).

The rise of computing in the mid '80s by the end user put the organization of information system in the playing the double part of being both a provider of information and also a provider of service (DeLone & McLean, 2003). The electronic administration quality (eSQ) scale postulated by Zeithaml et al. (2001)

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configured eleven measurements of service quality by utilizing interviews of focus groups of customers. These include, access, reliability, ease of navigation, personalization, efficiency, security, flexibility, responsiveness, price knowledge, assurance/trust, site aesthetics (Yanga et al., 2005). In spite of the fact that assurance/trust and price knowledge do not apply in the study on e-learning framework, the various measurements of service quality, for example, efficiency and ease of navigation are great indicators of behavioral expectation in utilizing an e-learning framework. Bitner (1990) focused on the requirement for libraries to assess service quality from the client's point of view.

Hernon and Altman (1996) inferred that those in charge of the administrations have customarily assessed quality as far as proficiency, yet have dismissed the point of view of the client. Such a demeanor is unsafe on the grounds that new innovation, particularly the Internet, has made it conceivable for individuals to look for other sources of information other than the physical library (Landrum & Prybutok, 2004).

2.10.4 Use

IS usage has been built up as a standout amongst the most used measures to survey IS achievement. Use is a genuinely complex measurement since there are such a variety of parts of it and it can be measured from a few points of view (DeLone and McLean 1992; DeLone and McLean 2003).

Use can be depicted as the effort that will be exerted to utilize the IS and present recurrence of use, number of times of usage, or use versus non-use as the

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most ideal approach to survey IS usage (Seddon (1997)). Nonetheless, taking into the account the study of DeLone and McLean (1992), using real use as an approach to evaluate IS achievement is just significant when use is intentional. In light of these musings, Rai et al. (2002) suggested that the most ideal approach to survey use is through the assessment of how the IS utilized, that is to quantify to which degree clients are reliant on the IS to execute their tasks.

2.10.5 User Satisfaction

User satisfaction has customarily been perceived as a yardstick for measuring IS achievement and can be portrayed as the outline of an individual's state of mind or emotions towards a few variables influencing that particular circumstance (Bailey and Person 1983; Raymond 1990). Taking into consideration the DeLone and McLean model, user satisfaction was alluded to the users reaction to the use of the IS (DeLone and McLean 1992).

User satisfaction has beforehand been indirectly measured through system quality and information quality (Rai et al. 2002). Baroudi and Orlikowski (1988) early postulated the thought that a solitary measure could be used to survey user satisfaction in the event that it is a general evidence of user satisfaction one was after. This was precisely what Rai et al. (2002) did, attempting to discover a global measure of user satisfaction just by measuring how individuals evaluated their general satisfaction with the system.

2.10.6 Management Support

Bearing in mind the success components of the IS success assessment, numerous studies give prove that management support is the most vital basic success variable for IS success. Management support is vital in guaranteeing IS success. These studies has presumed that management support have been perceived to have positive sway on IS success. There are a few meanings of management support. Some scholars characterize it as "to devote time viewing it proportionally with respect to the potential benefits and the costs incurred in the project" while other scholars characterize it as "the extent to which high management comprehends the significance of the venture capacities".

Another way to define it is "considering a scenario where a senior management venture patron/champion, the CEO and other senior administrators dedicate time to audit arrangements, catch up on results and encourage management issues". Management support can take a few distinct approaches, for example, showing responsibility, helping group members to overcome hindrances, getting things going and give consolation to group members. Overall, management support comes in the structure of adequate assets allotted both labor and the physical assets. It likewise incorporates clear show of authority and power given by the highest management body to the team leader and colleagues for guaranteeing the accomplishment of implementing the projects.

Management support refers to management approval and continuous support not only during the IS project implementation but also throughout the operational phase of the system. The selected management support measures are: management's

encouragement; providing all necessary resources; discussing problems associated with the system; appreciating the optimal use of the system; and having sufficient knowledge of the system (Moh'd Al-adaileh, 2009; Zaied, 2012)

2.10.7 Net Benefit

Net benefits is in the position of organizational and individual impacts being viewed as IS impacts that has advanced beyond the usage of the users in its immediate environment. This transformation from the impact effect to the net benefits was because of the way that impact effect can be viewed as either positive or negative, while net benefits permit scholars to discover both positive and negative results of utilizing the framework not restricting the outcomes to whether the framework is great or terrible. The decision of what benefits that ought to be measured ought to rely on upon the reason for the framework being assessed.

Besides, benefits for who is likewise a question to be answered while assessing an IS (DeLone & McLean, 2003). Torkzadeh and Doll (1999) arranged the conceivable benefits of utilizing IS into four distinct classes: satisfaction of the user, productivity, control of management and innovation.

2.11 Research Model and Hypothesis

The study research model is shown below:
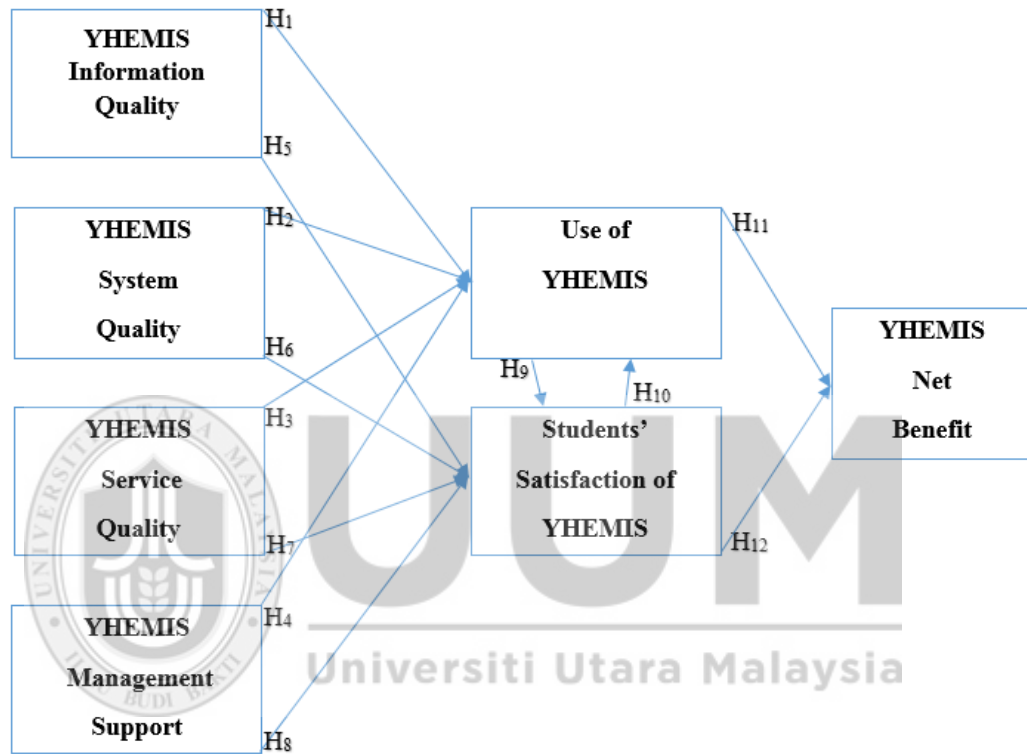
2.11.1 The Hypothesis

To examine this model these hypotheses are suggested:

1- H_1, Information Quality significantly affect use of (YHEMIS).

2- H_2, System Quality significantly affect use of (YHEMIS).

3- H_3, Services Quality significantly affect use of (YHEMIS).

4- H_4, Management Support significantly affect use of (YHEMIS).

5- H_5, Information Quality significantly affect students' satisfaction of (YHEMIS).

6- H_6, System Quality significantly affect students' satisfaction of (YHEMIS).

7- H_7, Services Quality significantly affect students' satisfaction of (YHEMIS).

8- H_8, Management Support significantly affect students' satisfaction of (YHEMIS).

9- H_9, Use significantly affect students' satisfaction of (YHEMIS).

10- H_{10}, students' Satisfaction significantly affect on use of (YHEMIS).

11- H_{11}, Use significantly affect Net benefits of (YHEMIS).

12- H_{12}, students' Satisfaction significantly affect Net benefits of (YHEMIS).

2.11.2 Definition of Variables

1- YHEMIS Information Quality: The admirable properties of the output of the system. This implies to the accuracy, completeness, timeliness and understandability.

Based on the literature review information quality has a significant affect on use and users (students') satisfaction of YHEMIS.

2- YHEMIS System Quality: The admirable properties of an information system, such as: sophistication, easy operation, accessibility and response time

Based on the literature review system quality has a significant affect on Use and users (students') satisfaction of YHEMIS.

3- YHEMIS Service Quality: The worthiness of the support that the user of the system gain from either the support personnel in IT or the IS department, such as: integrity, reliability and empathy of technical support personnel.

Based on the literature review service quality has a significant affect on use and users (students') satisfaction of YHEMIS.

4- Management Support: This infers the continuous support and endorsement of the management which is not limited to the period of implementing the IS project but also all through the system's operational, such as: management's encouragement.

Based on the literature review Management Support has a significant affect on Use and users (students') satisfaction of YHEMIS.

5-   YHEMIS Use: The level and approach to which the employees and clients make use of the information system capabilities, such as: ease of use, usefulness and actual use.

Based on the literature review Use has a significant affect on users (students') satisfaction and net benefit of YHEMIS.

6-   User (students') Satisfaction: The rate of the satisfaction of the users with support services, reports and websites, such as: the overall satisfaction.

Based on the literature review user (students') satisfaction has a significant affect on use and net benefit of YHEMIS.

7-   Net benefits: The rate at which IS contributes to individual success, group success, organizational success. Such as: Improvement in making decisions, improvement in performance. Net Benefit refers to the outcomes of information systems to individuals, in this study it refers to the students' perceived net benefit of a specific YHEMIS

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter discussed the research methodology of the study. Methodology is one of the important parts in a research. It is discusses about the technique that will use in the studies in order to achieve the goals of the research. This chapter will discuss the research approach, research design, the population and sample, the instrumentation, the procedures used to collect data, and the procedures for data analysis.

Main objective of the research was to assess the net benefit of Yemen Higher Education Management Information System. The evaluation of YHEMIS would effectively help to gauge the ISs development in Yemen and will provide a model that can be used as a standard to evaluate the benefit of other information systems in the context of educational organization in Yemen-Mukalla.

3.2 Research Process Structure

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┌─────────────────────────────────────────────────────────────────┐
│     Initial Interview with Hadramout University Information       │
│                      System Director                              │
└─────────────────────────────────────────────────────────────────┘
                               ↓
┌──────────────────────┐  ┌──────────────┐  ┌──────────────────────┐
│ Initial Literature   │→ │     Gap      │← │  Note the Phenomena  │
│      Review          │  │              │  │                      │
└──────────────────────┘  └──────────────┘  └──────────────────────┘
                               ↓
                     ┌──────────────────┐
                     │ Literature Review│
                     └──────────────────┘
                               ↓
┌─────────────────────────────────────────────────────────────────┐
│  Adapting Research Model (DeLone & McLean), 2003 Model with Adding│
│                      External Variable                            │
└─────────────────────────────────────────────────────────────────┘
                               ↓
┌─────────────────────────────────────────────────────────────────┐
│          Identifying Research Questions & Objectives             │
└─────────────────────────────────────────────────────────────────┘
                               ↓
┌─────────────────────────────────────────────────────────────────┐
│ Develop Conceptual Model, Formulating Hypotheses Based on Research│
│                           Questions                               │
└─────────────────────────────────────────────────────────────────┘
                               ↓
┌─────────────────────────────────────────────────────────────────┐
│ Design the instrument and construct items, validation of         │
│ instrument, translation, pilot study, analysis of pilot study    │
│ using alphas Cronbach test                                        │
└─────────────────────────────────────────────────────────────────┘
                               ↓
┌─────────────────────────────────────────────────────────────────┐
│   Collecting Data (Unit of Analysis, Population, Sampling Methods)│
└─────────────────────────────────────────────────────────────────┘
                               ↓
┌─────────────────────────────────────────────────────────────────┐
│                       Analysis of Data                            │
└─────────────────────────────────────────────────────────────────┘
                               ↓
┌─────────────────────────────────────────────────────────────────┐
│ Linking Hypotheses to Research Questions, Propose Model, Validate │
│       Model with Administrators / Previous Case Studies           │
└─────────────────────────────────────────────────────────────────┘
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┌─────────────────────────────────────────────────────────────────┐
│                   Discussion and Conclusion                       │
└─────────────────────────────────────────────────────────────────┘
                               ↓
┌─────────────────────────────────────────────────────────────────┐
│          Implications for Future Work and Limitations             │
└─────────────────────────────────────────────────────────────────┘
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3.3 Methodology

The research approach can be quantitative, qualitative, or mixed methods. All of them have their strengths and weaknesses and the best method to be use depends on research purpose and the accompanying questions for the sake of the study (Myers, 1997; Yin, 2013). This research is meant to use quantitative approach. This means that data can be collected using survey questionnaire. The quantitative method hoped to shed light into the phenomenon in terms that are more comprehensive.

This study used the quantitative approach where a cross sectional study of the YHEMIS will be evaluated. The quantitative approach enable data to be collected from different users to provide more information. The evaluation of an information system like YHEMIS involve various users (students), thus of data collection has to be done depending on the number of respondents and type of data to be collected. Quantitative is suitable because in this study, data collected be in a form of survey using an instrument that adapted from other studies.

The approaches of case study qualitative, or mixed methods, can be conducted in normal circumstances, it seems that, especially with the current dramatic political and security changes in Yemen, conducting such approaches is very problematic and tied up with number of difficulties. The greater obstacle that faced the researcher is the security issues in Yemen. Due to the war situation as well as air ban makes the return to Yemen for the purpose of conducting such approaches is too difficult and risky. However, with current political and security situations, such advantages may turn into disadvantages.

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For example, accessing to Hadramout University to do the interview and note phenomena will not achieve the desired end if I conduct my research using the case study method or other approaches such as qualitative or mixed methods. This is because Mukalla city is currently negatively affected by the war and, as a result, all government and private organizations are closed except hospitals and daily life is still ok (K, 2015). Hadramout university is no exception. Its senate has decided to stop the study since four months and no work until first October (Net, 2015).

However, during the instable situation, which is not helpful to perform the case study, qualitative, or mixed methods requirements, researcher meant to use quantitative approach that have been used in the most of evaluation of information system success literature.

Based on the connection with Miss.Fawzia the director of information system at Hadramout University and Mohammed Yslm the director of creative programs at the Mukalla-National Institute for Administrative Sciences, the survey questionnaire can be distributing easily during current situation to the targeted, despite the problems of shutdown of the university and the other troubles, the daily life is ok and life still goes on, and student started to back to the university in October 2015.

The questionnaire is personally administered, which is a good way to collect data (Saunders et al., 2011). Personally administered for the questionnaires, performed by the aid of team members: Miss.Fawzia and Mr. Mohammed with the help of several colleagues under their supervisions.

The researcher evaluated a system that is applied in five public universities in Yemen; among these universities is Hadramout University. The university Mukalla largest colleges was selected as a sample due to many reasons: those colleges are Administrative Science, Science and Education with number of students around 978 out of 1626 that constitutes 60% of level one students for the colleges located in Mukalla at Hadramout University.

Hadramout University success in applying the system and reached the second position in the list of ranking. Another reason is that, the researcher has a good access and connection with high management of Hadramout University. They gave a positive response and promise to coordinate in collecting the data from the targeted participants. Such access is frequently seen as an advantage in research sector (Brewerton & Millward, 2001).

Other Hadramout University colleges are located far away from Mukalla city as example Socotra college located in Socotra Island. The other universities are located in different governorate each governorate far from Hadramout the least distance between Hadramout and nearest governorate is 620KM according to Yemen Tourism website (Huraibi, 2015). Other Yemeni governorate are different in, political

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environment and historical context. Distance, historical context and political environment are constraints that lead to problematic with the researcher (Gerson & Horowitz, 2002).

This study collected opinions of the students, through questionnaires. The YHEMIS is used by most of the 2014-2015 level one students. In this study, stratified random sampling is used. Data analysis using descriptive and inferential statistics were used. The aim of this study was to evaluate (YHEMIS) net benefits based on students' perspective.

The study based on survey method due to the huge number of students who use the system, to collect the data for analysis. Thus, proper data collection sampling and analysis done. In this study, Statistical Package for the Social Science (SPSS) and tool was used to convert the population data to be presents in graph, pie chart, table, and to provide descriptive statistics. This gives a clear picture of the result. The Partial Least Squares (PLS) tool is used to manage and convert the correlation and regression result to be presents in well manner.

3.4 Research Design

The layout of the research is a basic part of the research process, which most often has implication on the quality of data which are showed up and revealed from respondents and even on the analysis of data. Specifically, the study intended to evaluate the success of (YHEMIS) using DM updated model with external factor (management support) to identify the factors affecting the use and users satisfaction.

3.5 Data Collection

Data collected through, questionnaire. Random sampling method was adapted to collect the samples where two hundred seventy eight respondents were used for the purpose of the data analysis. According the Saubders et al (2009), the questionnaire adapted from other researches gives the ability to compare the result and provides reliability. An instrument that used in this study is a questionnaire. Questionnaire, it is a set of questions for gathering information from a sample of individuals (Scheuren & Association, 2004).

This survey is composed of two parts: the first part contains general information, including demographic characteristics of the information system users. The second part of the study, the questions related to aspects of DM updated model of success. The preparation of the questionnaire was through an extensive review of the literature and validated by experts from the university to determine if the intended users (students) had any difficulty in understanding or if any ambiguous questions were there in the questionnaire. Data scale of this are rated and ranked on a Likert scale of five specified.

Table 3.1 Questionnaire Resources

Items	Source
Information Quality	(Davarpanah & Mohamed, 2013; Edlund & Lövquist, 2012; Zaied, 2012; Dernbecher, 2014; Wang & Liao, 2008; Wu & Wang, 2006; Chen & Kao, 2012; Iivari, 2005; Gorla, Somers, & Wong, 2010)
System Quality	(Davarpanah & Mohamed, 2013; Gorla et al., 2010; Zaied, 2012; Chen & Kao, 2012; Dernbecher, 2014)
Services Quality	(Chen & Kao, 2012; Davarpanah & Mohamed, 2013; Dernbecher, 2014; Edlund & Lövquist, 2012; Zaied, 2012; Gorla, Somers, & Wong, 2010)
Management Support	(Rouibah et al., 2009; Zaied, 2012; Moh'd Al-adaileh, 2009)
Use	(Moh'd Al-adaileh, 2009; Rouibah et al., 2009; Wang & Liao, 2008)
Student Satisfaction	(Davarpanah & Mohamed, 2013; Edlund & Lövquist, 2012; Moh'd Al-adaileh, 2009; Wang & Liao, 2008)
Net Benefit	(Dernbecher, 2014; Moh'd Al-adaileh, 2009; Wang & Liao, 2008; Wu & Wang, 2006)

The researcher communicated with Raid Mohammad Al-Adaileh the information system professor at Mutah University in Jordan to validate the questionnaire and

also, send it to Miss.Fawzia information system director. In order to assess the validity of the questionnaire was also sent to Dr.Mazni Binti Omar and Dr.Kamel Rouibah Senior lecturers at Utara University & Kuwait University. A certified translator (Al-Akhwain for Authorized Translation license number 235) translated this to Arabic language by hand. The reliability of the questionnaire tested in a pilot study.

3.6 Pilot Study

A total of 33 students participated in the pilot study. Davarpanah & Mohamed, 2013 based on (Cronbach, 1946), the test of reliability consistency is Cronbach's coefficient alpha which is used for multipoint scale items. The higher amount of coefficient indicates the better measures. Ideally, the Cronbach's coefficient alpha should be greater than 0.70 (Julie Pallant, 2013). Table I indicates the results of reliability for pilot study.

Table 3.2 Reliability Analysis of the Pilot Study

Construct	No. Items	Cronbach's Alpha
Information Quality	8	.961
System Quality	8	.965
Services Quality	6	.975
Management Support	4	.966
Use	6	.992
Student Satisfaction	4	.983
Net Benefit	3	.983

3.7 Population and Unit of Analyze

Unit of analysis for this research is the individual end users, students of level one 2014-2015 who use the system. The undergraduate degrees in Yemen consist of four Levels.

3.8 Sampling

The unit of analysis in this study involves the main users of YHEMIS of Hadramout University that are the students. Researcher will select random students to answer the questionnaire that's used the YHEMIS to meet the research aims. Determining the sample size is important in order to estimate the characteristics of the population (Hair et al., 2010). Roscoe as witnessed in Sekaran and Bougie (2010) indicated the sample size is larger than thirty and less than five hundred is proper and adequate for analysis, preferably 10 times or more than the number of the variables in the study.

Table 3.3 Cross Tabulation for the Sample

Colleges	A	B	C	Total
Population Size	256	327	395	978
	26%	34%	40%	100%
Sample Size	72	95	111	278

3.9 Data Analysis

The questionnaire already categorized to different parts based on the factors to be investigation so researches will not categorize it again afterwards. Five point Likert scale have been chosen because researcher just want to evaluate the success of (YHEMIS) based on users' perspective and the researcher believe that five Likert scale will give a good and enough indications of the users' perspective. In this study, Statistical Package for the Social Science (SPSS) and tool was used to convert the population data to be presents in graph, pie chart, table, and to provide descriptive statistics. This gives a clear picture of the result. The Partial Least Squares (PLS) tool is used to manage and convert the correlation and regression result to be presents in well manner.

CHAPTER FOUR
DATA ANALYSIS AND FINDINGS

4.1 Introduction

The results of the study are presented in this chapter. This chapter begins with showing the response rate and data screening followed by a discussion on the profiles of the respondents. After that, the results for the internal consistency reliability and the construct validity are tabulated on the basis of reliability. The reliability analysis is followed by the tables containing descriptive statistics like mean and standard deviation. Correlation among variables is also reported. At the end, the results of the regression are presented in order to test the hypotheses.

4.2 Response Rate

A total of 278 questionnaires were distributed to the students in Hadramout University in Mukalla, Yemen. Out of 278 distributed questionnaires, 266 were filled and returned by the respondents showing a response rate of 96 percent as shown in Table 4.1. In data cleaning process, it was found that five questionnaires were not usable for the purpose of analysis. Therefore, the number of usable questionnaires are 261 showing 94 percent response rate available for data analysis. Moreover, appropriate sample size was obtained for the study as proposed by Roscoe (1975) as the rules of thumb and stated in Sekaran and Bougie (2010) that a sample size between 30 and 500 is appropriate for data analysis (preferably 10 times or more than that of number of variables involved in the study). Furthermore, minimum sample size for performing factor analysis is 50 while for the purpose of data analysis, sample size must be 100 or above (Hair et al., 2010). The distributed

number of questionnaire i.e. 278 is the result of a lot of hard work, financial cost and effort that resulted in a response rate of usable 94 percent as the situation in Yemen is very unstable due to war. In order to enhance the response rate, a cover letter was attached to the questionnaire that explains the purpose and significance of the study and that also ensures the confidentiality and anonymity of the information collected. Continuous telephone calls by the researcher for the purpose of follow-ups were made to the director of information system at Hadramout University for increasing the response rate in sampling.

Table 4.1 Response Rate for This Study

Items	NO.	%
Questionnaires distributed by hand in Administrative College	72	
Returned questionnaires distributed by hand in Administrative College	69	95%
Usable questionnaires	67	97%
Unusable questionnaires	2	3%
Questionnaires distributed by hand in Science College	95	
Returned questionnaires distributed by hand in Science College	91	95%
Usable questionnaires	90	99%
Unusable questionnaires	1	1 %
Questionnaires distributed by hand in Education College	111	
Returned questionnaires distributed by hand in Education College	106	95%
Usable questionnaires	104	98%
Unusable questionnaires	2	2%
Total Questionnaires distributed	278	
Total Returned questionnaires	266	96%
Total Unusable questionnaires	5	1.9%
Total Usable questionnaires	261	98.1%

4.3 Demographic Characteristics of the Participants

The demographic profile of the participants with regard to their gender, age and colleges is presented in Tables below.

4.3.1 Respondent According to Gender

Of the 261 respondents in this research 179 or 68.6% were male and 82 or 31.4% were female. Hadramout University in Yemen-Mukalla has a large number of males as compared to females who are students in the university.

Table 4.2 Frequency distribution of gender

Gender	Frequency	%
Male	179	68.6%
Female	82	31.4
Total	**261**	**100%**
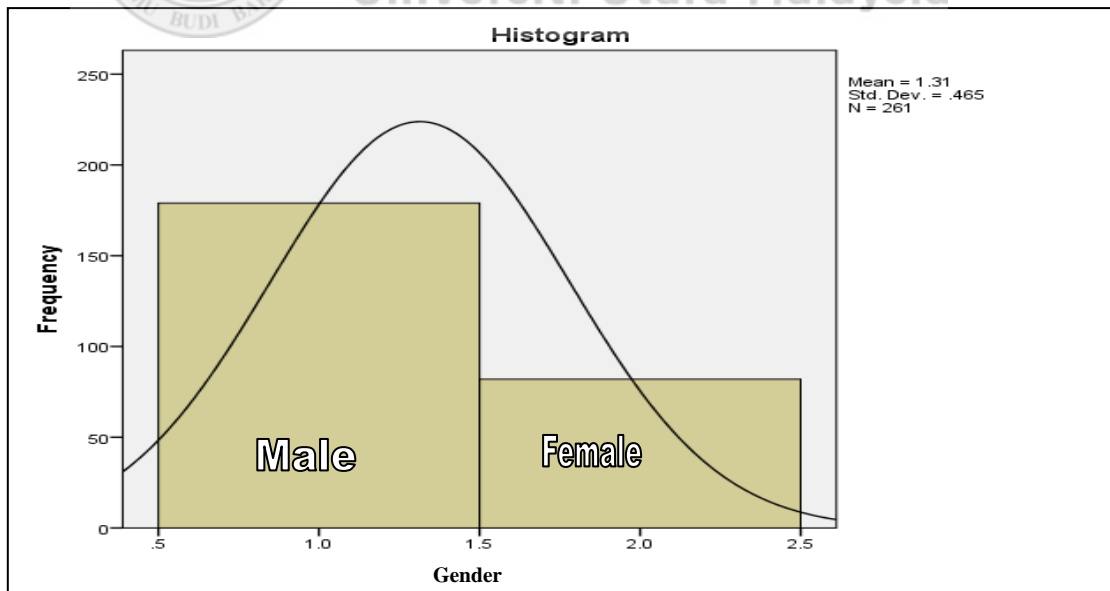
Figure 4.1. *Information Frequency Distribution of Gender*

4.3.2 Respondent's According to Age

In terms of age, 51 respondents or (19.5%) of the total less than 18 years, Whereas 173 respondents (66.3%) were within the age of 18-20 years and 37 respondents (14.2%) were within the age of greater than 20 years.

Table 4.3 Respondent's Frequency of Age

Age	Frequency	%
Less than 18	51	19.5%
18-20	173	66.3%
More than 20	37	14.2%
Total	261	100%
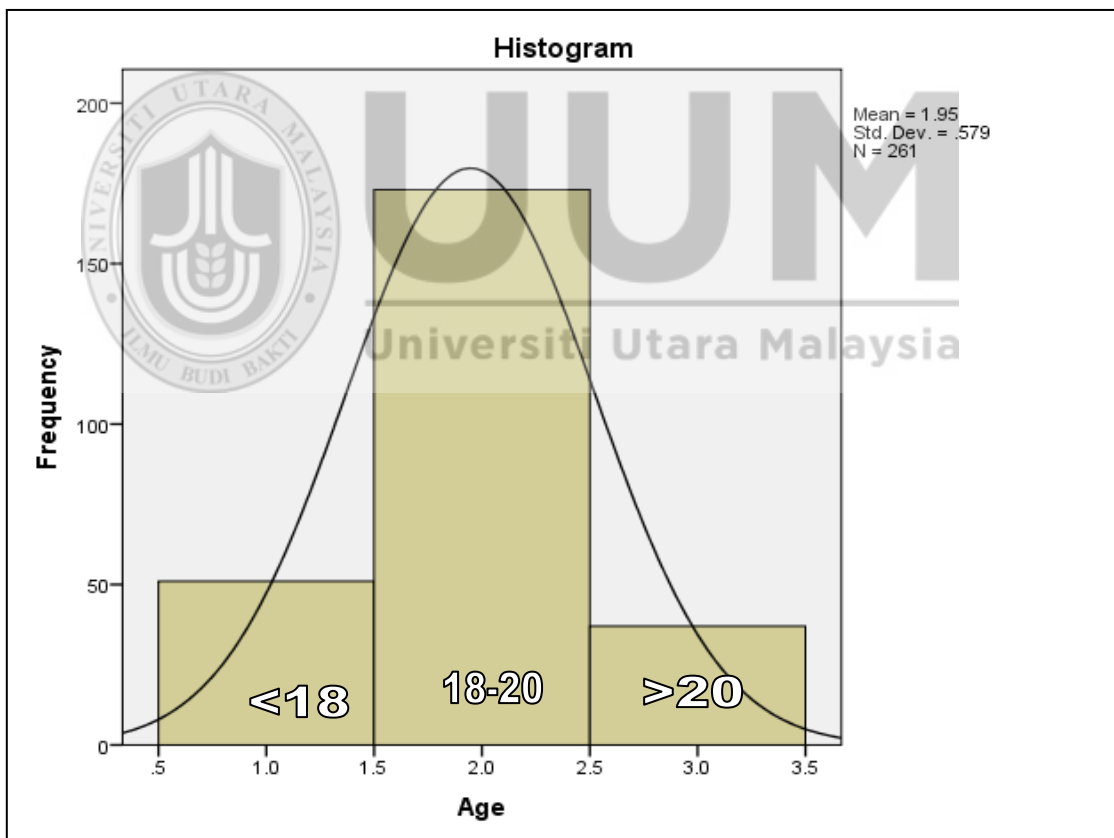
Figure 4.2. *Information Frequency Distribution of Age*

4.3.3 Respondent's According to Colleges

In terms of colleges, 67 respondents or (25.7%) from Administrative Science college, Whereas 90 respondents (34.5%) from Science college and 104 respondents (39.8%) from Education college.

Table 4.4 Respondent's Frequency of Colleges

Colleges	Frequency	%
Administrative Science	67	25.7%
Science	90	34.5%
Education	104	39.8%
Total	261	100%
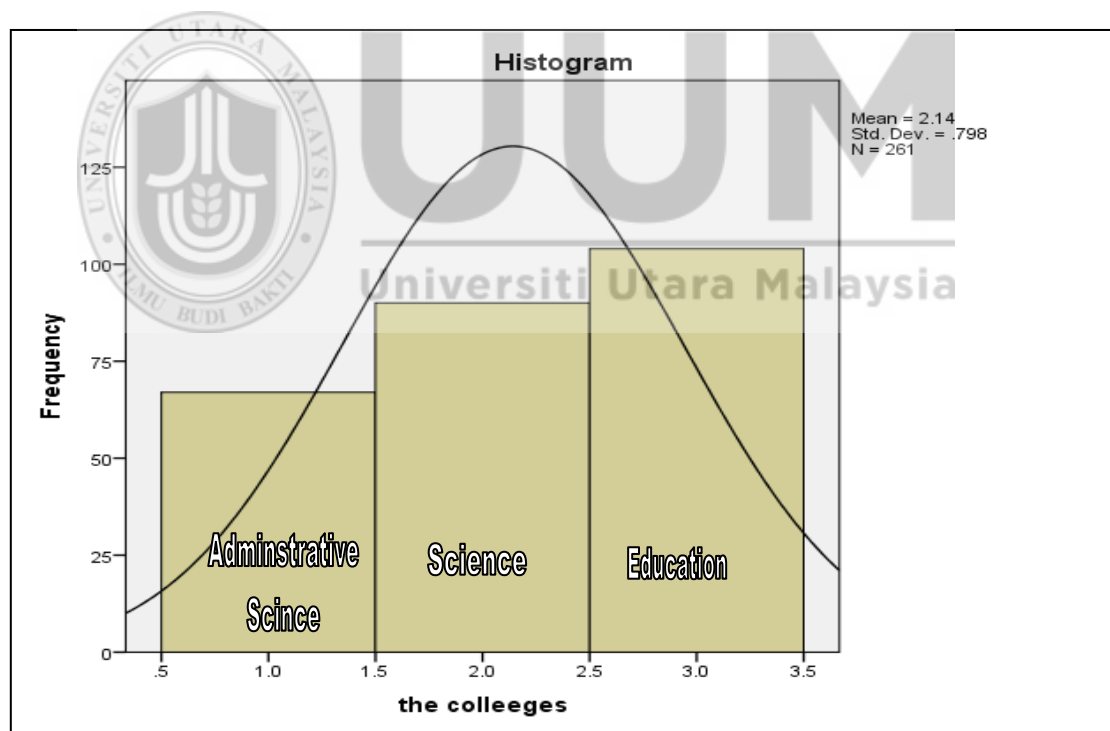
Figure 4.3. *Information Frequency Distribution of Colleges*

4.4 Data Screening

As missing values in the data generates negative effects in the analysis, so precautionary measures are taken of since data collection to avoid such negative occurrence. At the time of receiving the questionnaires from the respondents, it was ensured by the questionnaire administrator i.e. the researcher that all the questions are appropriately answered.

Hair et al. (2010) recommended the initial data screening for checking the missing data before data processing and analysis.

In order to identify any discrepancy in the data coding, initial data screening is exercise by the researcher. The frequency test conducted by the researcher shown no data entry error. No extreme maximum or minimum value is found because all the values were in the specified range and the values of mean and standard deviation were also in prescribed range. Thus, it is established that the data was clean. Besides that, no missing value is also verified using a missing value analysis given in SPSS.

Table 4.5 Data With No Missing Value

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Gender	261	100.0%	0	0.0%	261	100.0%
Age	261	100.0%	0	0.0%	261	100.0%
Colleges	261	100.0%	0	0.0%	261	100.0%
IQ1	261	100.0%	0	0.0%	261	100.0%
IQ2	261	100.0%	0	0.0%	261	100.0%
IQ3	261	100.0%	0	0.0%	261	100.0%
IQ4	261	100.0%	0	0.0%	261	100.0%
IQ5	261	100.0%	0	0.0%	261	100.0%
IQ6	261	100.0%	0	0.0%	261	100.0%

Table 4.5 Data With No Missing Value

IQ7	261	100.0%	0	0.0%	261	100.0%
IQ8	261	100.0%	0	0.0%	261	100.0%
SQ1	261	100.0%	0	0.0%	261	100.0%
SQ2	261	100.0%	0	0.0%	261	100.0%
SQ3	261	100.0%	0	0.0%	261	100.0%
SQ4	261	100.0%	0	0.0%	261	100.0%
SQ5	261	100.0%	0	0.0%	261	100.0%
SQ6	261	100.0%	0	0.0%	261	100.0%
SQ7	261	100.0%	0	0.0%	261	100.0%
SQ8	261	100.0%	0	0.0%	261	100.0%
SERVQUAL1	261	100.0%	0	0.0%	261	100.0%
SERVQUAL2	261	100.0%	0	0.0%	261	100.0%
SERVQUAL3	261	100.0%	0	0.0%	261	100.0%
SERVQUAL4	261	100.0%	0	0.0%	261	100.0%
SERVQUAL5	261	100.0%	0	0.0%	261	100.0%
SERVQUAL6	261	100.0%	0	0.0%	261	100.0%
MANGSUPP1	261	100.0%	0	0.0%	261	100.0%
MANGSUPP2	261	100.0%	0	0.0%	261	100.0%
MANGSUPP3	261	100.0%	0	0.0%	261	100.0%
MANGSUPP4	261	100.0%	0	0.0%	261	100.0%
USE1	261	100.0%	0	0.0%	261	100.0%
USE2	261	100.0%	0	0.0%	261	100.0%
USE3	261	100.0%	0	0.0%	261	100.0%
USE4	261	100.0%	0	0.0%	261	100.0%
USE5	261	100.0%	0	0.0%	261	100.0%
USE6	261	100.0%	0	0.0%	261	100.0%
USERSATISFACTION1	261	100.0%	0	0.0%	261	100.0%
USERSATISFACTION3	261	100.0%	0	0.0%	261	100.0%
USERSATISFACTION3	261	100.0%	0	0.0%	261	100.0%
USERSATISFACTION4	261	100.0%	0	0.0%	261	100.0%
NetBenefit1	261	100.0%	0	0.0%	261	100.0%
NetBenefit2	261	100.0%	0	0.0%	261	100.0%
NetBenefit3	261	100.0%	0	0.0%	261	100.0%

4.4.1 Normality

Skewness is a statistic used to measure the symmetry of the distribution while kurtosis measures the flatness or peakedness of the distribution (Hair et al., 2010). Both these measures are used to test the assumption of normality of the data (Tabachnick & Fidell, 2007). Hair et al. (2010) asserted that if the value of skewness statistic is equal to zero and value of kurtosis statistic is equal to 3, then the distribution is said be perfectly normal. If the value of skewness is greater or less than zero, then the distribution of the data would be skewed and value greater than 3 in absolute terms gives extremely skewed distribution Belhaj, 2012 noted based on (Chou & Bentler, 1995; Hu, Bentler & Kano, 1992; Kline, 2011). Kline (2011) proposed that the absolute values of Kurtosis and Skewness statistics should be less than 10 and 3 respectively. The value of skewness and kurtosis for all variables in present study is less than 0.805 and kurtosis value is less than -1.362. Therefore, it is concluded that the data is normally distributed.

Table 4.6 Values of Normality Skewness and Kurtosis Test

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Gender	261	.805	.151	-1.362	.300
Age	261	-.047	.151	-.467	.300
Colleges	261	-.261	.151	-1.385	.300
USERSATISFACTION1	261	-.024	.151	-1.273	.300
MANGSUPP4	261	-.128	.151	-1.269	.300
SERVQUAL2	261	-.116	.151	-1.290	.300
SERVQUAL3	261	-.116	.151	-1.290	.300
SQ6	261	-.157	.151	-1.189	.300
SQ8	261	-.186	.151	-1.178	.300
SQ5	261	-.145	.151	-1.272	.300
IQ4	261	-.109	.151	-1.097	.300
USE1	261	-.238	.151	-1.175	.300

Table 4.6 Values of Normality Skewness and Kurtosis Test

USE6	261	-.205	.151	-1.215	.300
USE5	261	-.188	.151	-1.222	.300
MANGSUPP1	261	-.310	.151	-1.119	.300
IQ5	261	-.187	.151	-1.364	.300
USE4	261	-.237	.151	-1.187	.300
USE3	261	-.279	.151	-1.162	.300
SQ1	261	-.200	.151	-1.258	.300
USE2	261	-.270	.151	-1.162	.300
SERVQUAL1	261	-.294	.151	-.995	.300
NetBenefit2	261	-.224	.151	-1.244	.300
USERSATISFACTION3	261	-.242	.151	-1.259	.300
USERSATISFACTION3	261	-.242	.151	-1.259	.300
SQ3	261	-.171	.151	-1.270	.300
SQ7	261	-.229	.151	-1.239	.300
SERVQUAL4	261	-.312	.151	-1.115	.300
SERVQUAL5	261	-.312	.151	-1.115	.300
SERVQUAL6	261	-.312	.151	-1.115	.300
MANGSUPP3	261	-.312	.151	-1.115	.300
NetBenefit1	261	-.312	.151	-1.115	.300
SQ2	261	-.221	.151	-1.174	.300
MANGSUPP2	261	-.337	.151	-1.068	.300
USERSATISFACTION4	261	-.163	.151	-1.294	.300
IQ6	261	-.210	.151	-1.176	.300
SQ4	261	-.229	.151	-1.255	.300
IQ2	261	-.233	.151	-1.128	.300
IQ3	261	-.233	.151	-1.128	.300
IQ1	261	-.364	.151	-1.086	.300
IQ7	261	-.364	.151	-1.086	.300
IQ8	261	-.364	.151	-1.086	.300
NetBenefit3	261	-.331	.151	-1.189	.300
Valid N (listwise)	261				

4.5 Data Analysis Technique

Statistical Package for Social Sciences i.e. SPSS version 20 is used for the purpose of data analysis. Descriptive statistics is used for describing data characteristics, factor analysis is used for identifying the factors, correlation analysis is used to observe the linear association among variables and multiple regression analysis is used to examine the impact of independent variables on dependent variable.

4.5.1 Reliability Analysis

In order to examine the quality of the questionnaire, reliability analysis is most effective. A number of statistics are available for investigating the internal consistency in the research. Cronbach's alpha is the most famous and widely used statistic for testing the internal consistency, this is also used in Testing & Evaluation item analysis (Alakklouk, 2012). In this study, 261 questionnaires are usable and analysed. The value of the reliability coefficient Cronbach's alpha for the present study is 0.70 as shown in the Table below:

Table 4.7 Reliability Analysis of the Variables

Variables	No of Items	Cronbach's Alpha
YHEMIS Information Quality	8	.965
YHEMIS System Quality	8	.956
YHEMIS Services Quality	6	.817
Management Support	4	.957
Use	6	.987
User Satisfaction	4	.702
YHEMIS Net Benefit	3	.761

4.5.2 Descriptive Statistical Analysis

The collected data is tabulated in order to look at the profile of the respondents.
Frequency distribution and percentage tables are used to describe the characteristics
of the data. The mean and the standard deviation are used as the descriptive statistics
for describing the respondents' profile.

4.5.2.1 Statistical Analysis of the Variables

There were 261 Mean scores and standard deviations of each construct item were
presented in Table 4.9 to Table 4.15. Table 4.8 represents the mean and standard
deviation scores for each factor.

Table 4.8 Mean and Standard Deviation Scores for each Variables

	Information Quality	System Quality	Service Quality	Management Support	Use	User Satisfaction	Net Benefit
N Valid	261	261	261	261	261	261	261
Missing	0	0	0	0	0	0	0
Mean	3.23	3.16	3.16	3.16	3.16	3.15	3.23
Std. Deviation	1.224	1.209	.982	1.285	1.322	1.262	1.147

4.5.2.2 Statistical Analysis of the Information Quality

As shown in the Table 4.9, the overall mean score for information quality is high (Mean = 3.23; Std. Deviation = 1.224).

Table 4.9 Mean and Standard Deviation Scores for Each Items of Information Quality Factor

	IQ1	IQ2	IQ3	IQ4	IQ5	IQ6	IQ7	IQ8	Mean Information Quality
N Valid	261	261	261	261	261	261	261	261	261
Missing	0	0	0	0	0	0	0	0	0
Mean	3.26	3.26	3.26	3.13	3.17	3.25	3.26	3.26	3.23
Std. Deviation	1.376	1.336	1.336	1.296	1.478	1.354	1.376	1.376	1.224

4.5.2.3 Statistical Analysis of the System Quality

As shown in the Table 4.10, the overall mean score for system quality is high (Mean = 3.16; Std. Deviation = 1.209).

Table 4.10 Mean and Standard Deviation Scores for Each Items of System Quality Factor

	SQ1	SQ2	SQ3	SQ4	SQ5	SQ6	SQ7	SQ8	Mean System Quality
Valid	261	261	261	261	261	261	261	261	261
Missing	0	0	0	0	0	0	0	0	0
Mean	3.18	3.21	3.20	3.26	3.10	3.07	3.20	3.08	3.16
Std. Deviation	1.409	1.367	1.395	1.400	1.389	1.353	1.382	1.352	1.209

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4.5.2.4 Statistical Analysis of the Service Quality

As shown in the Table 4.11, the overall mean score for service quality is high (Mean = 3.11; Std. Deviation = 1.006).

Table 4.11 Mean and Standard Deviation Scores for Each Items of Service Quality Factor

	SERV QUAL1	SERV QUAL2	SERV QUAL3	SERV QUAL4	SERV QUAL5	SERV QUAL6	Mean Service Quality
Valid	261	261	261	261	261	261	261
Missing	0	0	0	0	0	0	0
Mean	3.20	3.06	3.06	3.06	3.06	3.20	3.11
Std. Deviation	1.311	1.429	1.429	1.429	1.429	1.311	1.006

4.5.2.5 Statistical Analysis of the Management Support

As shown in the Table 4.12, the overall mean score for management support quality is high (Mean = 3.16; Std. Deviation = 1.285).

Table 4.12 Mean and Standard Deviation Scores for Each Items of Management Support Factor

	MANGSUPP 1	MANGSUPP 2	MANGSUPP 3	MANGSUPP 4	Mean Management Support
Valid	261	261	261	261	261
Missing	0	0	0	0	0
Mean	3.16	3.23	3.21	3.04	3.16
Std. Deviation	1.370	1.325	1.373	1.387	1.285

4.5.2.6 Statistical Analysis of the Use

As shown in the Table 4.13, the overall mean score for use is high (Mean = 3.16;

Std. Deviation = 1.322).

Table 4.13 Mean and Standard Deviation Scores for Each Items of Use Factor

	USE1	USE2	USE3	USE4	USE5	USE6	Mean Use
Valid	261	261	261	261	261	261	261
Missing	0	0	0	0	0	0	0
Mean	3.13	3.19	3.17	3.17	3.16	3.16	3.16
Std. Deviation	1.361	1.353	1.355	1.368	1.383	1.362	1.322

4.5.2.7 Statistical Analysis of the Students' Satisfaction

As shown in the Table 4.14, the overall mean score for students' satisfaction is high

(Mean = 3.15; Std. Deviation = 1.262).

Table 4.14 Mean and Standard Deviation Scores for Each Items of Students' Satisfaction Factor

	Students' SATISFACTION 1	Students' SATISFACTION 2	Students' SATISFACTION 3	Students' SATISFACTION 4	Mean Students' Satisfaction
Valid	261	261	261	261	261
Missing	0	0	0	0	0
Mean	2.97	3.20	3.20	3.25	3.15
Std. Deviation	1.390	1.420	1.420	1.412	1.262

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4.5.2.8 Statistical Analysis of the Net Benefit

As shown in the Table 4.15, the overall mean score for students' satisfaction is high (Mean = 3.23; Std. Deviation = 1.147).

Table 4.15 Mean and Standard Deviation Scores for Each Items of Net benefit Factor

	Net Benefit 1	Net Benefit 2	Net Benefit 3	Mean Net Benefit
Valid	261	261	261	261
Missing	0	0	0	0
Mean	3.21	3.20	3.28	3.23
Std. Deviation	1.373	1.400	1.410	1.147

4.5.3 Hypothesis Testing

To test the hypotheses suggested for this research, a Pearson correlation analysis was conducted to see the connection between the variables. According to Augustie, 2014 cited based on Pallant (2005) if the value of correlation is equal to 1.0, it indicates that there is perfect positive or negative relationship. If it is equal to zero it means that there is no relationship.

4.5.3.1 Correlation Analysis

The coefficient of correlation shows the direction and strength of linear association of variables in the study and the significance level of all coefficients is also given (Sekaran & Bougie, 2010). Positive sign with coefficient of correlation indicted that both variables move in same direction while negative sign designates the opposite direction of two variables (Sekaran, 2003). The value of coefficient of correlation equal to zero designates no relationship between two variables (Pallant, 2007).

4.5.3.1.1 Correlation Analysis of Information Quality, System Quality, Service Quality, Management Support and Use

The correlation between information quality, system quality, service quality, management support and YHEMIS use, are shown in Table 4.16.

From the table it can be noted that there are positive correlation between YHEMIS use, information quality (.738), system quality (.719), service quality (.027) and management support (.701).

Table 4.16 Correlation Analysis of Information Quality, System Quality, Service Quality, Management Support and Use

		Information Quality	System Quality	Service Quality	Management Support	Use
Information Quality	**Pearson Correlation**	1	.761	.098	.768	.738
	Sig. (1-tailed)		.000	.114	.000	.000
	N	261	261	261	261	261
System Quality	**Pearson Correlation**	.761	1	.082	.667	.719
	Sig. (1-tailed)	.000		.186	.000	.000
	N	261	261	261	261	261
Service Quality	**Pearson Correlation**	.098	.082	1	.100	.027
	Sig. (1-tailed)	.114	.186		.107	.662
	N	261	261	261	261	261
Management Support	**Pearson Correlation**	.768	.667	.100	1	.701
	Sig. (1-tailed)	.000	.000	.107		.000
	N	261	261	261	261	261
Use	**Pearson Correlation**	.738	.719	.027	.701	1
	Sig. (1-tailed)	.000	.000	.662	.000	
	N	261	261	261	261	261

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

4.5.3.1.2 Correlation Analysis of Information Quality, System Quality, Service Quality, Management Support and Students' Satisfaction

The correlation between information quality, system quality, service quality, management support and students' satisfaction, are shown in Table 4.17.

From the table it can be noted that there are a positive correlation between students' satisfaction of YHEMIS, information quality (.714), system quality (.740), service quality (.069) and management support (.732).

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Table 4.17 Correlation Analysis of Information Quality, System Quality, Service Quality, Management Support and Students' Satisfaction

		Information Quality	System Quality	Service Quality	Management Support	students' satisfaction
Information Quality	Pearson Correlation	1	.761	.098	.768	.714
	Sig. (2-tailed)		.000	.114	.000	.000
	N	261	261	261	261	261
System Quality	Pearson Correlation	.761	1	.082	.667	.740
	Sig. (2-tailed)	.000		.186	.000	.000
	N	261	261	261	261	261
Service Quality	Pearson Correlation	.098	.082	1	.100	.069
	Sig. (2-tailed)	.114	.186		.107	.267
	N	261	261	261	261	261
Management Support	Pearson Correlation	.768	.667	.100	1	.732
	Sig. (2-tailed)	.000	.000	.107		.000
	N	261	261	261	261	261
students' satisfaction	Pearson Correlation	.714	.740	.069	.732	1
	Sig. (2-tailed)	.000	.000	.267	.000	
	N	261	261	261	261	261

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

4.5.3.1.3 Correlation Analysis of Use and Students' Satisfaction

The correlation between use and students' satisfaction, are shown in Table 4.18.

From the table it can be noted that there are a positive correlation between use (.757)

and students' satisfaction.

Table 4.18 Correlation Analysis of Use and Students' Satisfaction

		Use	Students Satisfaction
Use	**Pearson Correlation**	1	.757
	Sig. (2-tailed)		.000
	N	261	261
Students Satisfaction	**Pearson Correlation**	.757	1
	Sig. (2-tailed)	.000	
	N	261	261

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

4.5.3.1.4 Correlation Analysis of Students' Satisfaction and Use

The correlation between students' satisfaction and use, are shown in Table 4.19.

From the table it can be noted that there are a positive correlation between students'

satisfaction (.757) and use.

Table 4.19 Correlation Analysis of Students' Satisfaction and Use

		Students Satisfaction	Use
Students Satisfaction	**Pearson Correlation**	1	.757
	Sig. (2-tailed)		.000
	N	261	261
Use	**Pearson Correlation**	.757	1
	Sig. (2-tailed)	.000	
	N	261	261

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

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4.5.3.1.5 Correlation Analysis of Use, Students' Satisfaction and Net Benefit

The correlation between use, students' satisfaction and net benefit, are shown in Table 4.20. From the table it can be noted that there are a positive correlation between use (.619), students' satisfaction (.707) and net benefit.

Table 4.20 Correlation Analysis of Use, Students' Satisfaction and Net Benefit

		Use	Students Satisfaction	Net Benefit
Use	**Pearson Correlation**	1	.757	.619
	Sig. (2-tailed)		.000	.000
	N	261	261	261
Students Satisfaction	**Pearson Correlation**	.757	1	.707
	Sig. (2-tailed)	.000		.000
	N	261	261	261
Net Benefit	**Pearson Correlation**	.619	.707	1
	Sig. (2-tailed)	.000	.000	
	N	261	261	261

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

4.5.3.2 Regression Analysis

For the purpose of this study, simple regressions was carried out to predict net benefit based on use and students' satisfaction in light of information quality, system quality, service quality and management support, The PLS procedure was applied to estimate the dependent variable of the research model. PLS algorithm used two times for the purpose of mutual influence between use and user satisfaction we estimated two models: model 1 testing the whole model with relation use to students' satisfaction, model 2 analyzing the whole model with reversibly students' satisfaction to use (Dernbecher, 2014; Iivari, 2005).

Additionally, we used a bootstrapping procedure (Chin, 1998) and generated 500 bootstrap samples (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005) to test the significance of the path estimates.

This analysis provides a means of objectively assessing the degree and character of the relationship between dependent and independent variables by forming the variate of independent variables (Hair et al., 2010).

4.5.3.2.1 Regression Analysis of Information Quality, System Quality, Service Quality, Management Support on Use

H_1, Information Quality significantly affects use of (YHEMIS).

The result of the research showed that (β= 0.312; t= 3.380; p= 0.001), thus hypotheses H_1 was supported because it is significant. The result in line with the past studies of information quality was significantly affecting the use of information system (Halawi et al. 2007; Kositanurit et al. 2006; Rai et al., 2002).

H_2, System Quality significantly affects use of (YHEMIS).

The result of the research showed that (β= 0.313; t= 3.849; p= 0.000), thus hypotheses H_2 was supported because it is significant. The result in line with the past studies of system quality was significantly affecting the use of information system (Halawi et al. 2007; Hsieh & Wang 2007; Iivari 2005; Rai et al. 2002; Hong et al. 2001/2002; Venkatesh & Davis 2000;Venkatesh & Morris 2000; Igbaria et al. 1997; Suh et al. (1994).

H_3, Services Quality significantly affects use of (YHEMIS).

The result of the research showed that (β= -0.051; t= 1.157; p= 0.248), thus hypotheses H3 was not supported because it is not significant. The result in line with the past studies of service quality was not significantly affecting the use of information system (Dernbecher, 2014; Halawi, McCarthy, & Aronson, 2007; Kositanurit, Ngwenyama, & Osei-Bryson, 2006; Wang & Liao, 2008; Lee, Kim, & Gupta, 2009; Lwoga, 2014).

H$_4$, Management Support significantly affects use of (YHEMIS).

The result of the research showed that (β= 0.259; t= 3.067; p= 0.002), thus hypotheses H$_4$ was supported because it is significant. The result in line with the past studies of Management Support was significantly affecting the use of information system (Sabherwal, Jeyaraj, & Chowa, 2006; Rouibah, Hamdy, & Al-Enezi, 2009; R.-F. Chen & Hsiao, 2012; Hasan, Shamsuddin, & Aziati, 2013; Shih & Huang, 2009; Winarto & Hadiprajitno, 2011; Marble, 2003).

4.5.3.2.2 Regression Analysis of Information Quality, System Quality, Service Quality, Management Support on Students' Satisfaction

H$_5$, Information Quality significantly affects students' satisfaction of (YHEMIS).

The result of the research showed that (β= 0.133; t= 2.037; p= 0.042), thus hypotheses H$_5$ was supported because it is significant. The result in line with the past studies of information quality was significantly affecting the students' satisfaction of information system (Chiu et al. 2007; Halawi et al. 2007; Leclercq 2007; Kulkarni et al. 2006; Wu & Wang 2006; Almutairi & Subramanian 2005; Iivari 2005; Wixom & Todd 2005; McGill et al. 2003; Bharati 2002; Kim et al. 2002; Palmer 2002; Rai et al. 2002; Seddon & Kiew 1996; Marble 2003).

H$_6$, System Quality significantly affects students' satisfaction of (YHEMIS).

The result of the research showed that (β= 0.309; t= 4.690; p= 0.000), thus hypotheses H$_6$ was supported because it is significant. The result in line with the past studies of system quality was significantly affecting the students' satisfaction of

information system (Chiu et al. 2007; Halawi et al. 2007; Hsieh & Wang 2007; Leclercq 2007; Kulkarni et al. 2006; Wu & Wang 2006).

H_7, Services Quality significantly affects students' satisfaction of (YHEMIS).

The result of the research showed that (β= 0.029; t= 0.620; p= 0.535), thus hypotheses H_7 was not supported because it is not significant. The result in line with the past studies of service quality was not significantly affecting the students' satisfaction of information system (Lwoga, 2014; Aladwani, 2002; Chiu, Chiu, & Chang, 2007; Choe, 1996; Palmer, 2002; Marble, 2003)

H_8, Management Support significantly affects students' satisfaction of (YHEMIS).

The result of the research showed that (β= 0.227; t= 4.687; p= 0.000), thus hypotheses H_8 was supported because it is significant. The result in line with the past studies of Management Support was significantly affecting the students' satisfaction of information system (Moh'd Al-adaileh, 2009; Sabherwal et al., 2006; Marble, 2003; V. Cho, 2007; Hasan et al., 2013; Kim et al., 2012).

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4.5.3.2.3 Regression Analysis of Use on Students' Satisfaction

H_9, Use significantly affects students' satisfaction of (YHEMIS).

The result of the research showed that (β= 0.311; t= 5.338; p= 0.000), thus hypotheses H_9 was supported because it is significant. The result in line with the past studies of use was significantly affecting the students' satisfaction of information system (Chiu et al. 2007; Halawi et al. 2007; Iivari 2005; Guimaraes et al. 1996).

4.5.3.2.4 Regression Analysis of Students' Satisfaction on Use

H_{10}, students' Satisfaction significantly affect on use of (YHEMIS).

The result of the research showed that (β= 0.421; t= 5.112; p= 0.000), thus hypotheses H_{10} was supported because it is significant. The result in line with the past studies of students' satisfaction was significantly affecting the use of information system (Chiu et al. 2007; Halawi et al. 2007; Bharati & Chaudhury, 2006; Kulkarni et al. 2006; Wu & Wang 2006; Iivari 2005; Wixom & Todd 2005; McGill et al. 2003; Kim et al. 2002; Rai et al. 2002; Torkzadeh & Doll 1999; Khalil & Elkordy 1999; Winter et al. 1998).

4.5.3.2.5 Regression Analysis of Use, of Students' Satisfaction on Net Benefit

H_{11}, Use significantly affects Net benefits of (YHEMIS).

The result of the research showed that (β= 0.052; t= 0.732; p= 0.465), thus hypotheses H_{11} was not supported because it is not significant. The result in line with the past studies of use was not significantly affecting the net benefit of information system (Ang & Soh, 1997; Iivari, 2005; Lucas & Spitler, 1999; McGill, Hobbs, & Klobas, 2003; Vlahos & Ferratt, 1995; Wu & Wang, 2006; Cho et al., 2015; Khayun & Ractham, 2011; Koh, Prybutok, Ryan, & Wu, 2010)

H_{12}, students' Satisfaction significantly affect Net benefits of (YHEMIS).

The result of the research showed that (β= 0.732; t= 11.503; p= 0.000), thus hypotheses H_{12} was supported because it is significant. The result in line with the past studies of students' satisfaction was significantly affecting the net benefit of information system (Halawi et al. 2007; Iivari 2005; McGill & Klobas 2005; Vlahos et al. 2004; McGill et al. 2003; Morris et al. 2002; Rai et al. 2002).

4.5.4 Hypothesis Testing Summery

Table 4.21 Summery of the Hypothesis Regression Analysis

H	Hypothesis	β	T	P	Status
H1	Information Quality significantly affect use of (YHEMIS).	0.312	3.380	0.001	Support
H2	System Quality significantly affect use of (YHEMIS).	0.313	3.849	0.000	Support
H3	Service Quality significantly affect use of (YHEMIS).	-0.051	1.157	0.248	Not Support
H4	Management Support significantly affect use of (YHEMIS).	0.259	3.067	0.002	Support
H5	Information Quality significantly affect students' satisfaction of (YHEMIS).	0.133	2.037	0.042	Support
H6	System Quality significantly affect students' satisfaction of (YHEMIS).	0.309	4.690	0.000	Support
H7	Service Quality significantly affect students' satisfaction of (YHEMIS).	0.029	0.620	0.535	Not Support
H8	Management Support significantly affect students' satisfaction of (YHEMIS).	0.227	4.687	0.000	Support
H9	Use significantly affect students' satisfaction of (YHEMIS).	0.311	5.338	0.000	Support
H10	Students' satisfaction significantly affect on Use of (YHEMIS).	0.421	5.122	0.000	Support
H11	Use significantly affect Net Benefit of (YHEMIS).	0.052	0.732	0.465	Not Support
H12	Students' satisfaction significantly affect Net Benefit of (YHEMIS).	0.732	11.503	0.000	Support

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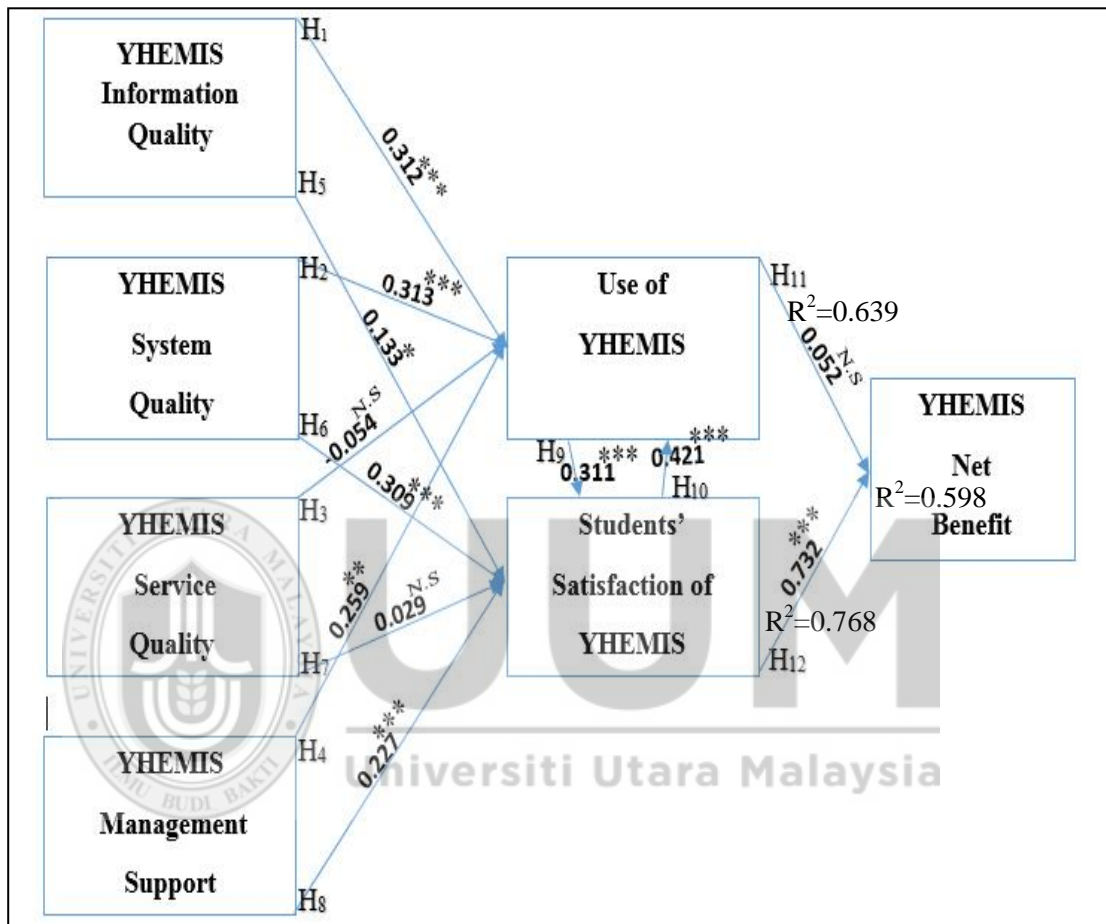
Figure 4.4. *Hypothesis Testing Result*

CHAPTER FIVE
DISCUSSION AND IMPLICATIONS

5.1 Introduction

This is the final chapter which discusses the findings of the study based on the research questions developed as well as different literature reviewed and the objectives developed in Chapter. This study provides identification of YHEMIS success evaluation based on the students' perspective. The first section is the discussion followed by the second section on limitation of research. The third section is the recommendation for future study, and finally the fourth section on the conclusion of study.

5.2 Discussion

The idea of this dissertation is to determine what factors influence use and students' satisfaction of YHEMIS and to know whether students perceived benefit or not. After measuring the six dimensions, and net benefit allowed researcher to understand the relationship between the six dimensions as a whole and net benefit. The results of this study is positively related to students' perceived net benefit. With the recognition that information quality, system quality and management support suggest positive significant affect on use and students' satisfaction of YHEMIS while service quality has not significantly affect the use and students' satisfaction of YHEMIS. Use and Students' satisfaction of YHEMIS have a high positive significant affect on each other. On the other hand students'

satisfactions have a high positive significant affect toward net benefit while use has not significantly affect the net benefit.

Hypothesis (H_3 service quality significant affect the YHEMIS use, H_7 service quality significant affect the students' satisfaction and H_{11} use significant affect net benefit) not supported and rejected due to being insignificant. The other hypothesis (H_1, H_2, H_4, H_5, H_6, H_8, H_9, H_{10} and H_{12}) are accepted due to being significant. Further, squared multiple correlations R^2 that represent the explanatory power of the structured model should be greater than 0.33 (Chin, 1998). H_9 and H_{10} comprise a mutual influence between use and user satisfaction we estimated two models: model 1 testing H_9 from use to user satisfaction, model 2 analyzing H_{10} reversibly (Dernbecher, 2014; Iivari, 2005).

Regarding to our model the R^2 for use (0.639), students' satisfaction (0.767) and R^2 net benefit (0.598) are high and same value in both models 1 & 2. In summary nine out of twelve hypotheses were supported.

This model accounted for 60% of the variance in perceived net benefit, with students' satisfaction exerting a stronger direct effect than use on perceived net benefit. 64% of the variance in use was explained by information quality, system quality, service quality, management support and students' satisfaction, while 77% of the variance in students' satisfaction was explained by information quality, system quality, service quality, management support and use. The direct and total effect of students' satisfaction on perceived net benefit was 0.732, while the direct and total effect of use on perceived net benefit was 0.053. That means students' satisfaction

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exhibited stronger direct and total effects on perceived net benefit than use. Among information quality, system quality, service quality and management support the direct and total effect of system quality was the strongest affect on use 0.313 and on the students' satisfaction 0.310.

This research seeks to examine the benefit of YHEMIS to Hadramout university students, in particular by using IS success DM updated model with the external factor (management support). Researcher elaborates on the relevant YHEMIS characteristics influencing the use and students' satisfaction and subsequently perceived benefit to the students. Researcher proposed their model which is shown in Figure 5.1
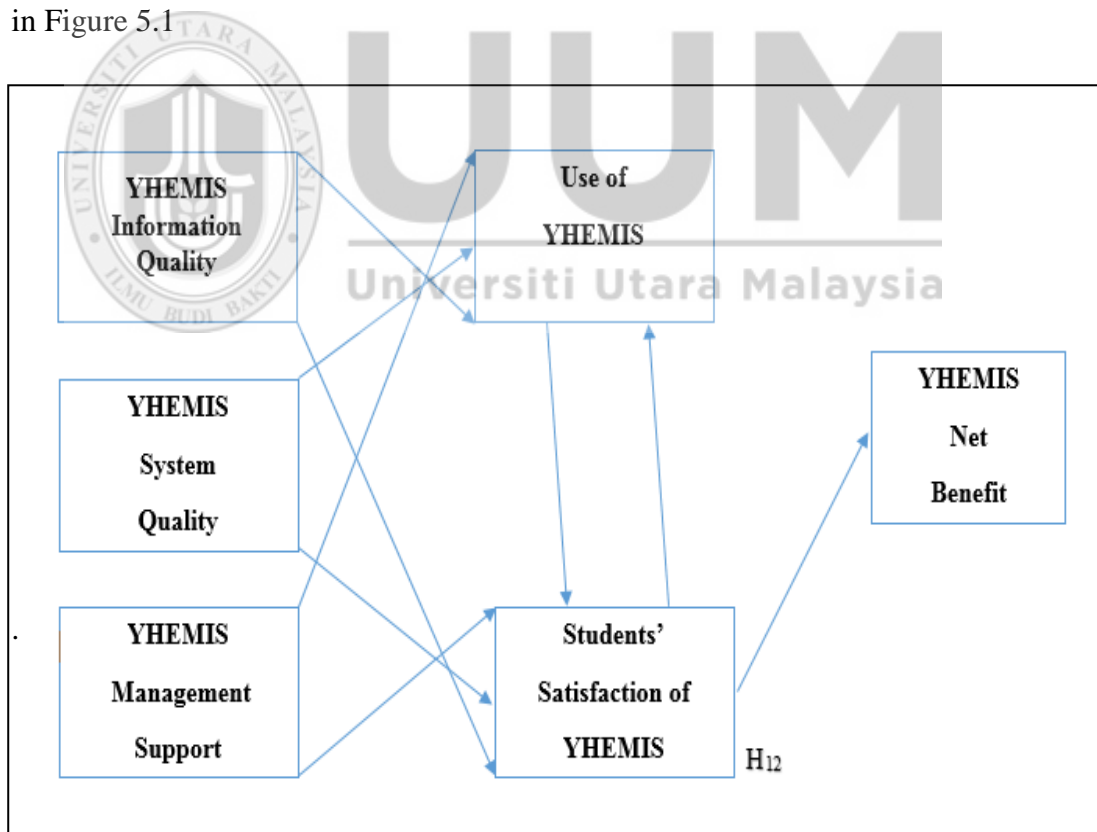

Figure 5.1. *Proposed Model*

This model consists with the finding of past studies that found there are significant relationship of information quality, system quality and management support on the use of systems and system satisfaction : (Kositanurit et al. 2006; Halawi et al. 2007; Hsieh & Wang 2007; Iivari 2005; Rai et al. 2002; Hong et al. 2001/2002; Venkatesh & Davis 2000; Venkatesh & Morris 2000; Igbaria et al. 1997; Suh et al. (1994) ; Rouibah, Hamdy, & Al-Enezi, 2009; R.-F. Chen & Hsiao, 2012; Hasan, Shamsuddin, & Aziati, 2013; Shih & Huang, 2009; Winarto & Hadiprajitno, 2011; Marble, 2003; Chiu et al. 2007; Leclercq 2007; Kulkarni et al. 2006; Wu & Wang 2006; Almutairi & Subramanian 2005; Wixom & Todd 2005; McGill et al. 2003; Bharati 2002; Palmer 2002; Seddon & Kiew 1996; Moh'd Al-adaileh, 2009; Sabherwal et al., 2006; V. Cho, 2007; Kim et al., 2012).

Also, it consists with the studies that found significant relationship between use and users' satisfaction and versa : (Chiu et al. 2007; Halawi et al. 2007; Iivari 2005; Guimaraes et al. 1996; Chiu et al. 2007;Halawi et al. 2007; Bharati & Chaudhury, 2006; Kulkarni et al. 2006; Wu & Wang 2006; Iivari 2005; Wixom & Todd 2005; McGill et al. 2003; Kim et al. 2002; Rai et al. 2002; Torkzadeh & Doll 1999; Khalil & Elkordy 1999; Winter et al. 1998).

Finally the model consist with the past studies that conclude a significant relationship between users' satisfaction and perceived net benefit : (Halawi et al. 2007; Iivari 2005; McGill & Klobas 2005; Vlahos et al. 2004; McGill et al. 2003; Morris et al. 2002; Rai et al. 2002).

Researcher send the model and findings to the administrator for discussion purpose, she in her turn discussed with the others in charge. Director of information system at Hadramout University, confirmed that the result came as expected and the model meet the expectation.

This research provides several important implications for YHEMIS success research and management. According to the proposed model, students' satisfaction is considered to be a closer measure of YHEMIS success than the other success measures.

Perceived net benefit should develop if the formation of perceived quality, system use, management support and user satisfaction is appropriately managed. Thus, management attention might more fruitfully focus on the development of these psychological and behavioral processes.

In order to increase students-perceived net benefit, YHEMIS administrators need to develop it more with a good service quality, information quality, system quality and provide more management support which, in turn, will influence students system usage behavior and satisfaction evaluation, and the corresponding perceived net benefit.

In this model, system students' satisfaction was found to have the strongest direct and total effect on perceived net benefit, indicating the importance of system satisfaction in promoting students-perceived net benefit.

To answer the research first question *what are the factors that influence the use and students' satisfaction of the Yemen Higher Education Management Information system (YHEMIS) in Hadramout University?*

Researcher found that YHEMIS use significantly influenced by system quality, information quality and management support. The YHEMIS students' satisfaction influenced significantly by first system quality then management support and last information quality.

That is mean the characteristics of system quality (sophistication, easy operation, accessibility and response time), information quality (accuracy, completeness, timeliness and understandability) and management support (management's encouragement) significantly positive affect the use and students' satisfaction of YHEMIS. On the contrary, researcher could not find significant influence for service quality on both use and students' satisfaction. In addition, YHEMIS perceived net benefit significantly affected by the user's satisfaction, while not significantly affected by the use. Use have an effect on YHEMIS perceived bet benefits (but not at a significant level). This may be it may be explained by the mandatory nature of the system, which in turn may inflate the significance of use in the model.

This are in line with studies done by Wu and Wang (2006), who found that system use will occur when the user feels that the perceived net benefits has a higher value than that of cost of use, both in terms of expenditure and effort exerted.

It is worth noting that the effect of service quality on use and students satisfaction was not significant. This is maybe because of war status or may be it is explained by the mandatory nature of the system, or it is because most of the study participants had moderate experience.

Yemen is a poor country, with low levels of education, and the unemployment rate is high. Thus, this all may affect the people's mind and culture of Yemen. This situation resulted in students to not care about the service quality, as long as the service is available.

Regarding to Dernbecher 2014 based on (Delone, 2003; Langer, 1989) the relevance of the three quality dimensions is dependent on the level of analysis. As in this study the focus was not just on the service quality of YHEMIS itself. Service quality seems to be of no importance for the net benefits of YHEMIS students' satisfaction and use.

To answer the research second question *What is the benefit of Yemen Higher Education Management Information system (YHEMIS) to the students?*

The research note that the YHEMIS benefit the students because they are highly satisfied with it they are satisfied with the information and system quality that provided by the system they are also satisfied with management support provided.

The total answers for the item net benefit was tend to be more positive rather than negative. The R^2 of net benefit is high (0.598). YHEMIS is useful and benefit the students by allow them to save time and help them to register and got their information quickly and in easier way.

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5.3 Contributions

- This dissertation categorized as the first dissertation of evaluation information system success conducted in the context of Yemen Universities.

- Researcher provided an instrument for evaluation the information system success in Yemeni Context.

- Researcher provided an empirical data for future researches.

- Researcher applied IS success model with external factor (management support) to identify individual student perceptions of YHEMIS.

- Researcher found that (management support) play a vital role as a success measure.

- Researcher found that individualities of YHEMIS at Hadramout University provided an evidence that it can increase the use and satisfaction of the users.

- Researcher a proof users perceived a benefit form the information system applied in the universities in context of Yemen.

- Research findings provide supporting to the stakeholder of YHEMIS to moving forward in developing the next information system projects.

- Research findings provide supporting to the stakeholder and managers of Hadramout University to apply the plan of shifting the work mechanism to electronical.

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5.4 Study Limitation

This study has some limitation that research hope to be targeted in the future.

This research has limitations such as the sudden war in Yemen that happened during the research process, which in turn create several obstacles to the researcher. Thus the researcher has fewer options to collect data from the students in one university only and has to depend on others to distribute the questionnaires due to air ban and safety.

This research is new to information system success evaluation Yemeni researchers. Validity of this research, the results derived based on a single research that studied the characteristics of YHEMIS and targeted the Hadramout university students. Thus, researcher need the other researchers' effort for further evaluation over different context, population and culture to make confirmation for the proposed model.

CHAPTER SIX
CONCLUSION AND FUTURE WORK

6.1 Introduction

This is the final chapter which discusses the conclusion and future work of the study.

6.2 Recommendation for future Research

- This dissertation which is the first dissertation on the evaluation of information system success conducted for Yemen universities has opened the path for other Yemeni researchers to conduct future researches on evaluation of information success system generally.

- This research also confirms that use, user satisfaction, and perceived net benefit are complementary yet distinct constructs, influences on the perceived net benefit of an YHEMIS.

- Researcher call for further investigation for the model in different context.

- Researcher open the way for the Yemeni researchers to conduct studies in the information system success evaluation in Yemeni context.

- Researcher recommended investigating the factor management support in other models.

- Researcher recommended investigating the relationship between use and net benefit.

6.3 Conclusion

This study seek to examine and apply an IS success model. Researcher proposed a conceptual multidimensional success model of Yemen Higher Education Management Information System: The Case of Hadramout University in Yemen. The proposed model consists of seven measures of success: information quality, system quality, management support, use, users' satisfaction and net benefit. This study planned to fill the gap of lack of studies and empirical data of IS success evaluation and to open the way to do more studies in other universities in Arab region. Furthermore, aimed to enhance our understanding of how IS success evaluation is an important for an organization and it is an integral part of IS's investment. Research in information systems success in public universities is relatively few if compared to study done in the private organizations. Last the findings of this study confirmed that students of Hadramout University are satisfied with Yemen Higher Education Management Information System. In general the system is success and benefited the Hadramout University students. The factors information quality, system quality and the external factor management support were playing a vital role in the success of YHEMIS whereas service quality not.

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