



**ADDIS ABABA UNIVERSITY
COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCE
SCHOOL OF INFORMATION SCIENCE**

**DETERMINANT FACTORS OF STUDENTS SATISFACTION
WITH UNIVERSITY PORTAL SERVICES IN ADDIS ABABA
UNIVERSITY**

BY:

KEDIR ABDU

**JUNE, 2018
ADDIS ABABA, ETHIOPIA**



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UNIVERSITY**

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER
OF SCIENCE IN INFORMATION SCIENCE.

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NAME AND SIGNATURE OF MEMBERS OF THE EXAMINING BOARD

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DECLARATION

This thesis has not previously been accepted for any degree and is not being concurrently submitted in candidature for any degree in any university.

I declare that the thesis is a result of my own investigation, except where otherwise stated. I have undertaken the study independently with the guidance and support of my research advisor. Other sources are acknowledged by citations giving explicit references. A list of references is appended.

Signature: _____
Kedir Abdu

The thesis has been submitted for examination with my approval as university advisor.

Signature: _____
Rahel Bekele (PhD)

DEDICATION

I would like to dedicate this thesis work to my mother, Fatima Hussein and for my newly born child, Anes Kedir Abdu.

ACKNOWLEDGEMENT

First and for most, I would like to thank Allah for making everything possible! Without him was nothing, but with him everything is!

My great gratitude goes to my advisor, Dr. Rahel Bekele, for your dedicated, unreserved, and valuable comments and timely feedback. I appreciate her unlimited support and assistance.

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ABSTRACT

The aim of this study is examine the factors affecting student's satisfaction with university portal services in Addis Ababa University. This study answers for five questions on factors affecting student's satisfaction of university portal with survey data from a sample of 314 students from collage of business and economics in Addis Ababa University. Data were collected through personal-administered questionnaire adapted from the updated DeLone and McLean (2003) information system success model. Descriptive analysis results revealed that information quality, system quality, educational service availability, user ability and Technological / IT infrastructural issues were influence users satisfaction. Educational service availability and Technological / IT infrastructural issues were found as the dominating factor in this research.

Keywords: User satisfaction, web portals, principal factor analysis, descriptive statistics

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LIST OF ACRONYMS

AAU	Addis Ababa University
WBIS	Web Based Information System
WWW	World Wide Web
SPSS	Statistical Package for Social Sciences
KMO	Kaiser-Meyer-Olkin Measure of Sampling Adequacy
PCA	Principal Component Analysis
IT	Information Technology
IS	Information System

CHAPTER ONE

INTRODUCTION

1.1 Background

The Innovation of computer technology has brought significant changes in the interconnected world. The Web has evolved into an environment for a wide range of activities, including entertainment, communication, commerce, information search and many others.

Pokhrel & Vemulapalli (2010) State that today most of the human beings are directly or indirectly affected by the development of the computer system. People are enjoying its success and new innovations. One of the innovations of the computer system is the Web Based Information System (WBIS). Despite of having cultural diversity, linguistic diversity, geographical differences, working under different organizational culture, political diversity, legal difference, etc., On today's world people are trying to grow their market and share their information globally. Web based information system (WBIS) provides easy means of platforms for all to achieve their respective goals within a short time and with the secure means of data transform. Most of the time WBIS acts like mediator between clients and organizations or users and service providers. Organization incorporates web based information system for the purpose of reaching the various clients all around the world easily, quickly and cheaply.

Information systems can now be web-enabled, unlike the traditional stationary information systems. Web portals are a part of this advancement (Ajoye, 2014)

Tatnall (2007) Claim that web portal is a gateway to information and services from multiple sources in a unified way, using a single, unique user interface. A Web portal usually features specific functions, such as search mechanisms, access to databases, user registration and personalization options (Ajoye, 2014).The use of web portals offered universities and postgraduate education huge opportunities for expansion, introduction of new services and development of both qualitative and quantitative ways of delivering information and services. Therefore the need to satisfy the information requirements of students in the Addis Ababa University has brought about the large scale investment in both graduate and Postgraduate

School web portal. There is therefore need on the part of the stakeholders to justify the huge investment in this area by measuring the impact of the information system on end-user satisfaction. The end-user satisfaction is regarded as the individual's attitude toward computer uses, or related activities required performing tasks in an organization (Rainer et al., 2010).

1.2 Statement of the Problem

Recently most of the universities in Ethiopia have started to adopt and adapt technologies to enhance their educational qualities. However, the satisfaction of the user is not that much studied. Many authors underlined that studying about the user satisfaction is very important; to assess usability and accessibility of the users; to improve service quality; to improve system quality. For instance, Mohammad (2012) evaluated the relationship between student's satisfactions with university portal services using the updated DeLone and McLean(2003) model; according to his finding, system quality, user's ability and educational services availability were established as factors that affect student's satisfaction in Jordanian universities, while, information quality does not significantly influence student's satisfaction. More over his findings demonstrate that the students are satisfied if the system output is friendly secured, easy to use and visibly attractive to the users. It should be compatible with different levels of ability of the users. Also, the students will be satisfied depending on the quality and availability of services provided by universities. Educational service availability is the most effective factor that influences student's satisfaction with universities portal in Jordan. They are more satisfied if the portal meets their needs. This will greatly improve the efficiency of universities which actively seek ways to improve their portal service. Students' ability to use university portal services influences user's satisfaction. User's satisfaction will increase if the user can perform the necessary work more effectively.

Lee et al.(2009) were analyzed end-user satisfaction with campus portal services and they found that user ability, playfulness, design, and support service influence student satisfaction.

Masrek (2007) evaluated the effectiveness of universities' portal implementation from the perspective of students and he found that service quality and systems quality are significantly correlated with user satisfaction. This implies that a web portal that is implemented without considering users is meaningless and it will create the opportunity to the users back to traditional system.

Abdel, Hamza, & Abuhamad (2015) also showed that educational services availability, system quality and information quality influence students' satisfaction, with service availability being the major determinant. The cultural perspective was employed to explain their results. However, as the researcher observed from the literature, authors (Mohammad , 2012;Ajoye,2014 and Abdel, Hamza, & Abuhamad, 2015) did not consider about the faculty of students. For example, we can't certify that both natural and social science students have the same system interaction capability to the system. Therefore, this study mainly focused on the factors affecting student's satisfaction for the use of web portal in college of business and economics at Addis Ababa University. More over the portal system of Addis Ababa university haven't done preliminary investigation for the web portal to make sure whether the users are satisfied or not. This work therefore addresses summative evaluation of the web portal. Moreover, previous targeted the study population only on bachelor degree and graduate students however this study addressed all level of education(Bachlor degree,Masters degree and PhD students) to get a better result. Finally, the main contribution for this study is the universities and other educational institutions may need to know these factors to newly design or redesign their existing system that focused on the user.

1.2.1 Research Questions

The following research questions are addressed by this study:

- What do the students say about system quality of the web portal?
- What is the perception of students on information qualities of web portal?
- What do the students say about educational service availability of the web portal?
- To what extent user ability affect to use the web portal?
- What are the information technology (IT) infrastructural issues that affect the use of web portal?

1.3 Objectives of the Study

1.3.1 General Objective

The major objective of this study is to investigate the factors affecting students' satisfaction with university portal services in Addis Ababa University. The factors examined are educational services availability, user ability, system quality, information quality and IT infrastructural issues of web portal.

1.3.2 Specific Objectives

In order to satisfy the above-mentioned general objective, this research aims at accomplishing the following specific objectives:

- To investigate the information quality of the web portal.
- To examine educational services available on web portal.
- To assess user ability of students on web portals specifically to students portal services.
- To assess system quality of web portal from students point of view.
- To identify IT infrastructure issue that affect student's satisfaction on web portal.

1.4 Significance of the Study

The outcome of the study contributes to the body of knowledge on information quality, system quality, educational service availability, user ability and IT infrastructural issues of web portal, and might (a) help the universities to understand the student's perceptions and the factors in websites and online services and applications, (b) to identify significant factors for the design of university portal services, focusing on end users, and (c) help to facilitate future developments, upgrades and re-designs of universities' portals.

1.5 Scope of the Study

The aim of this study was exploring the factors affecting students' satisfaction with university portal services in Addis Ababa University. The intention of the study was to provide answers to this problem by adapting and adopting the updated DeLone and McLean(2003) model that would explain and describe the criteria that users use when evaluating the portals. The DeLone and McLean model of information system success model constructed by six interrelated variables.

Those are information quality, system quality, and service quality, intension to use, user satisfaction and net benefit. However, the researcher extended the model and developed a new conceptual model to evaluate both the existed and the newly added variables. The new added variables are educational service availability, user ability and IT infrastructural issues.

Although the portal system of Addis Ababa University is designed to provide services for students, applicants, and academic staff and for those who play management role, due to time and budget constraints this study is limited to only Addis Ababa university regular students.

1.6 Organization of the Report

The remaining part of the thesis is organized as follows. Chapter two aims to cover a theoretical foundation for the research through a review of the existing relevant literature related to the study. It consolidates and collates the existing studies on web portals, the classification of web portal according to different authors, the benefit and services of web portal to higher education, related works to the existing study, conceptual framework and finally summary of the chapter.

Chapter three defines and discusses the research model followed in the study and outlines the methodology used in the research. It presents the research approach and methods used to conduct the investigation, with a detailed explanation of the rationale behind the choice of particular research methods. The chapter also explains the data analysis techniques used in the study

Chapter four describes the quantitative and qualitative results, factor analysis, and discussion of results and summary of analysis results.

Chapter five presents' conclusions, recommendations and future works. List of references and appendices are shown at the end of the paper.

CHAPTER TWO

LITERATURE REVIEW

2.1 Web Portals

Educational institutions are among the one of organizations to develop and implement websites. Previously, the goal was to simply have a presence on the web however now days many higher education institutions are attempting to include the necessary information to their students, academic staff and for key stakeholders. According to Lynch, P. & Horton, S.(2002), there are two parts in planning a website: the first one is to determine the goals and resources needed to achieve them, and the other is to specify the target audience, site details, technology needed, and an assessment of the results. Thus, first, developers need to determine what the organization wants to accomplish on the web.

Therefore web portal is a term, often used interchangeably with gateway, for a World Wide Website whose purpose is to be a major starting point for users when they connect to the Web (Tatnall, 2007). Users are the player of the organization to accomplish its goals.

Pickett & Hamre (2002) state that a portal is a gateway to resources in accessible networks such as Internet or intranet. Thus, a site may include many web pages or even a simple web page, which presents users a static view of available resources and information. Researchers who worked on web portal admitted that there is no unique way for defining web portal until now.

Bajec, M.(2005) State that a web portal is a connection, content, commerce, and community. Some researchers described a web portal as a gateway to information. Such as Looney & Lyman (2000) indicated that, basically, web portals collect a sort of applicable information resources into a single, "one-stop" Web page; this function helps to prevent users from feeling lost on the Web.

Aragones, A. & Hart-Davidson, W.(2002) states that a portal provides a starting point for users to access and explore information on the WWW. Yahoo (www.yahoo.com) is a general portal; a university website homepage is a specialized portal. Another source had declared that portals integrate varied channels as a central point of information. Thus, essentially, a web portal is a

gateway or single access point to resources on the Internet. Some researchers consider a web portal as a user-centric community based tool for example consumer portals like Google! Some portals provide information for a special group of user with specific interest. When other users with similar interests browse a web portal, a virtual community is formed. Hence, a web portal has to provide information and facilitate communication to community so that they can share knowledge and experiences, hold discussion forums, etc. (Mansourvar and Yasin, 2010).

According to Dias (2001) mentioned that it is important for portal users to be able to connect with everyone who share common interests. Which means that it act as central media to connect service provider to the service receiver. Some researcher look at a web portal as a system that provides multiple services to the community; they believed that web portals aggregate two types of services in to a single interface; personal services for users and Maintaining information service.

According to Technopedia, Web portals often provide a particular look and feel for organizations and enterprises, and also provide access control and procedures. They are accessible from multiple platforms like personal computers, smartphones and other electronic devices. Prominent features of a web portal are data access, personal content, transactions, security, published content and search. It is capable of presenting information based on the user. It can also allow users to voluntarily personalize the information presented in the portal. There are two types of web portals, namely, horizontal web portals and vertical web portals. The former target large communities of users, whereas the latter are more specific to the contents and objects.

The report by Powell, A.(2003) states that a portal is a network service that collects information from different resources into a personalized and single point of access using searching technology such as cross searching, harvesting and alerting to help users. Web portal was used to describe mega-sites like AOL, Yahoo and MSN for the first time because users used these sites as a starting point when searching for a special topic. However, web portals support other services except searching for users. There are many kinds of portals that are categorized according to different criteria:

Murray, G. (1999) Distinguished portals based on their contents and the target users.

1. **Information Portals:** These portals provide information to users.
2. **Collaboration Portals:** These portals connect users and provide facilities for them to collaborate in activities, etc.
3. **Expertise Portals:** These portals allow users to communicate with each other and share their experiences, special interests and services.
4. **Knowledge Portals:** These portals provides to users a combination of all the above mentioned services.

On the other hand Dane Phillip (2008) divided portals into 6 categories based on their contents:

Vertical Portals: These portals concentrate on the industry domain or vertical portals. A vertical portal acts as a gateway to present the products and services of a specific industry to the users. A vertical portal, also called vortal provides all the tools, information, articles, research findings and statistics related a domain or vertical. A good example of these portals is cnet.com, which presents computer and related information; mp3.com that focuses on mp3, audio, production, etc.

There are 2 main types of vertical portal available:

1 - Corporate Portal: Allows personalized access to specific resources of an industry.

2- Commerce Portal: Provides business-to-consumer, business-to-business, and e-commerce information.

Horizontal Portals: These portals are single entry point of a web surfer to provide a variety of resources and information on different topics to the general users. Yahoo.com and msn.com are classic examples of horizontal portals. They are considered as “megaportal” and they have search engines to help users search for information on a large variety of topics such as weather, stock or news. Horizontal portals facilitate their members with personalized web page through different channels.

Intranet Portals:

These portals are used by members who are in the enterprise network or intranet of organizations, institutions, etc. Enterprise portals provide employees with updated information such as documents for management system, applications, online training, etc., as well as facilities to communicate using emails, messaging, or web meetings.

Knowledge Portals: Knowledge portals service users by providing access to useful information and resources. These portals increase the effectiveness of searching.

Enterprise Portals: These portals have become one of the hottest topics in the new age of technology. Enterprise portals also called corporate portals support their members by providing accessing to suitable resources of the certain company or organization. An enterprise portal is useful for the company's own employees as well as the company's business partners such as suppliers and customers. With its link to public web portals, an enterprise portal provides a virtual workplace for each user. Hence, the website of a company is not only a corporate portal; it also provides personalization and navigation functionalities to its users. One of the most important advantages of this portal is the ability to access its services via mobile devices services like cell phone, PDA's or hand-held PC's which are useful when out in the field, for decision making and other business or company's tasks.

Market Space Portals: These portals support business-to-business and business to-customer e-commerce.

Another classification of portals was offered by Rainer et al. (2010) in which portals was categorized into:

1. Commercial (public) portals which offer content for diverse communities; this type is the most popular on the internet (e.g. yahoo.com and msn.com).
2. Corporate portals that provide access to rich content within relatively narrow corporate and partners' communities. They also are known as enterprise portals.
3. Publishing portals which are intended for communities with specific interests.
4. Others: such as personal portals that target specific filtered information for individuals, and mobile portals which are accessible from mobile devices.

A university portal, which can be considered among the "2" category addressed above, is a web site that personalizes services and information to the needs of universities' staff, students and visitors (Macharia & Nyakwende, 2009).

A university portal is very important because it provides a common entry point for all services available at the university, which results in improved user experience and improved relationship with and between stakeholders, particularly students (Abdulhamid & Ismaila, 2010)

A university web portal is an application with a single web-based interface to access aggregated and personalized view of information, resources, applications, and education/academic options from internal and external sources via a network connection in a password-protected setting. This

is not only to save time and money but also to make a task easy and effective management of user information.

Recently, university portals have attracted a great deal of interest because they are considered a source of competition superiority which could result in attracting more students (Lee, Choi, & Jo, 2009). The success of university portals depends on users' satisfaction (Yu-Hui, 2011) who are mainly student in this case. More satisfied students lead to widespread usage of the portal in the university.

2.2 Web Portals in Higher Education

Portals serve as powerful tools to help universities improve collaborative activities (Jones, Provost, & Pascale, 2002). They can also facilitate knowledge acquisition, sharing and discovery by allowing users to publish documents, share ideas, work collaboratively and store information in a repository that is searchable. According to Toit & Bothma (2009), universities are increasingly using web portals to support the delivery of academic learning to their students, staff and other stakeholders.

According to Hung-Chang, Yi-Ching, & Ching-Yi (2005), particularly the students need to use computers and have access to networks to retrieve training materials, databases, financial data, etc. Thus, a web portal for university students is essential to learning. It is also important for the university portal to be integrated with the university IT infrastructure, both internal and external. A university portal can be viewed as a single point, which provides comprehensive access to information on courses, data search tools, educational resources, interactive teaching materials, communication tools, etc.

According to Jones, Provost, & Pascale (2002), different stakeholders are provided with vital links into the university community and there is that belief that users are not restricted by the geographical or even physical barriers in terms of communicating and exploring new knowledge. They further explained that new tactical ways of increasing the universities competitive advantage is by promoting innovation and research activities that can lead to acquisitions of grants. Oslen (2002) States that the most recent application of portals in higher education institutions has been to form a point of entry for administrative records for students, such as online registration, financial aid, and academic records. The universities portals are also used for staff administrative records such as time-tables, leave balances, etc.

Goodman, A. & Kleinschmidt, C.(2002) also mentioned that universities consider three aspects pertaining to the use of the portals:

- Systems integration
- Utilization of e-business technology
- Provision for a wider use of data and services offered by existing systems

Systems Integration

By increasing the use of the Internet, universities have tried to have a more integrated IT system within their campuses. In this way, universities can transform more effectively and offer more varied services to the campus community.

Utilization of e- business technology

Today, companies use the Internet to provide better and more efficient services to their staff, and customers. Universities and other educational institutions have done likewise. In some countries, some important processes in e-business have been developed by educational institutions to offer better services to the staff and students.

Provide wider use of data and services of existing systems

The knowledge and resources in the existing information systems of universities could be useful if the students and lecturers have easy access to them. Portals can be used to facilitate access to the required information.

Tate & Barnes (2009) noted that universities which have been at the forefront of online service provision, have gradually changed, and are beginning to provide their online services using the web portal. These portals act as a single point of online access to information as well as provide utilities to perform enrolment, course delivery, course support, library transactions, job search, etc. Sulaiman, N. & Burke, M.(2009) believed that it is essential for the universities to conduct further study on web portals that will enable students to have access to much needed data and resources that are pertinent to their studies.

2.3 Web Portal Service Classification for Higher Education

Ang, Z. et al.(2005.)Divided web portal services into three types:

Search

The need to find essential information on a certain topic or subject has made the search function a very important component of a web portal. Web portals use different types of strategies such as homegrown solution or outside solutions to satisfy the members' needs.

Information

Web portals provide different types of information to users, news, sports, job vacancies, weather reports, etc. Users can get this information directly from portals, even without any special username and password. For example, a user can access the weather reports just by clicking on the relevant link on the web portal.

Personal Service

These services allow the users to customize the mode of interacting with the portal. Usually, users need to register to assign a username and password to use these services. Emails, chat rooms, messaging services or personalized home pages are some examples of these types of services. Each user has a different interface to use these services. As we are aware, when a user opens the yahoo mail, she/he has a different interface from that of other users. This reduces the time that users spend to search for information on a special subject on the Internet. This function, however, causes traffic on the portals to slow down more than the others services.

Information and personal services have increased resulted in the number of visitors to web portals.

Similarly,Allan, R., et al. (2003) also listed some services available on web portals as follows:

- Online shopping
- Query – based resource discovery
- Query – based application selection
- Job offering service
- Job submission
- Video/ audio delivery and portal-based collaborative services
- Resource scheduling
- Query and result
- Policy-based authorization
- Deployment service
- Lifecycle management

2.4 Features of University Web Portals

Ofoegbu et al.(2014) list some usable features of university web portals. Some useful features include:

- Easy access to administrative and study-related information, allowing students to view and update their personal details online to ensure they don't miss any important University correspondence.
- The 'Information' Directory helps students to locate administrative and study-related resources, policies and information, as well as services to enhance the university experience.
- Access to student email account, allowing sending and receiving email messages.
- Access to student notices, allowing students to see the notices relevant to them as well as sending their own notices.
- Access to 'Personal Links'. Save their favorite websites in the 'Quick Links' portlet of the home page in the student portal so they can access them from any computer.
- Links to subject learning tool pages are conveniently located in one place.
- Access to today's weather: a useful tool to help plan your day.
- Front page summaries of students' email, notices and library accounts for quick access.
- Access to library services online. Conduct catalogue searches, view past exam papers and find other key services from one location.
- The student Portal can be accessed from any computer within the University or off-campus at any time provided you have an Internet connection and a University of email account.

2.5 Benefits of Web Portals to Higher Education

The potential benefits realized from a campus-wide portal are extensive and revolve around increased efficiency and the ability to provide university constituencies with access to information (Abdulhamid & Ismaila, 2010). Some notable benefits include:

- User identification through a single log-on account;
- Centralized administration and enforcement of security driven by user authentication protocols;
- A common entry point for all services available at the university;
- A common architecture for integrating administrative systems, course management tools, and content from disparate systems and providers;
- Consistent appearance and behavior, facilitating improved user experience and improved relationship with and between constituents; and
- The ability to engage, empowers, and retains constituents by providing a sense of membership in an academic community.

A successful portal implementation requires a significant amount of effort and collaboration between key stakeholders at the university. Without the full commitment from senior University management and other key stakeholders, the project may never return its full benefit.

2.6 Theoretical Framework

According to DeLone and McLean (2011), six distinct dimensions of IS success: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. But this study considered along with the technological factor, only four factors from the extended (DeLone and McLean, 2003). Since the use of the Addis Ababa university web portal have not an option, but rather mandatory to the students, the construct “use” was included in user satisfaction since users satisfaction of an information system could only be preceded by its use. Net benefit as a construct was dropped since measuring it was out of context in this study. User satisfaction which includes ‘use’ in this context remains the most viable measure of the IS success.

2.6.1 Educational Services Availability of Web Portal

The primary function of university web portals are usually created is helping students in term of their educational services such as downloading class contents, uploading assignments, took part in the discussion on a given topic by teacher, communicating with faculty members for any assistance (Syed et al. 2017). It intends to design in such way that it becomes a hub of learning with teacher-students interactions in 24 hours via online. The planned services to students and staff facilitate speeding up administrative process, flexible approach in transactions by the individualized self-services (Bajec, M. , 2005). Parasuraman, Zeithaml, & Berry (1985) define service quality in terms of the difference between expected and perceived service. They state: ‘‘the key to ensuring good service quality is meeting or exceeding what (customers) expect from the service’.

University web portals provide many services like:

- Registration service
- Email services
- Students' status system (grades, attendance record, financial status)
- Research databases (online library service, international library services)
- E-learning gateway (Class material and lecture notes.)
- Social media links and communities

2.6.2 User Ability of Web Portal

User ability is the primary factor for the information system users and without this the superior system, service and information quality become useless (Bajec, M. , 2005).A user may be short of skill for checking information or surfing internet especially for web based systems. A website is an interactive learning environment between customers and business. It is important to increase customers’ abilities to learn how to browse and to find relevant information on the web (Liu & Arnett, 2000).

2.6.3 System Quality of Web Portal

It is the processing quality of an information system, which was measured in terms of ease of use, functionality, availability, flexibility, reliability and response time (Shih, 2004). According to Cheung & Lee (2005) "System quality is a measure of the information processing system itself, and focuses on the outcome of the interaction between the user and the system. The key capability of the Internet supports greater interactivity for consumers, and thus system quality is largely characterized by the interaction between consumers and the website".

2.6.4 Information Quality of Web Portal

Information quality is the output quality of an information system, which was measured in terms of accuracy, ease of understanding, usefulness, completeness, relevance and whether it was up to date (Liao , Palvia, & Lin, 2006). Lee & Kim (2010) propose the characteristics of information quality such as content, accuracy, format, timeliness, and ease of use.

2.6.5 IT Infrastructural Issues of Web Portal

Technological and infrastructure factors include uninterrupted power supply, necessary up gradation, and sufficient internet facilities. These factors indicate the facilitating conditions which is essential for maintaining constant services.

2.6.6 User Satisfaction of Web Portal

According to Kotler (2000), satisfaction in general refers to the feeling of pleasure or disappointment resulting from comparing expectations with the perceived performance.

The definition of customer satisfaction has been widely debated as organizations increasingly attempt to measure it. Customer satisfaction can be experienced in a variety of situations and connected to both goods and services. It is a highly personal assessment that is greatly affected by customer expectations (Center for the study of social policy, 2007).

Customer Satisfaction is a most widely researched subject matter in the academic world from last two decades but users' satisfaction of web portals roughly appeared in the literature since 2005 (Abdel, Hamza, & Abuhamad, 2015)

2.7 Related Works

Kuo et al.(2005) made an empirical study of Measuring Users' Perceived Portal Service Quality. A multi-dimensional scale was developed to analyze user perceived portal quality. The scale was developed to measure six dimensions of web quality: responsiveness, competence, quality of information, empathy, web assistance, and call-back systems. They found that customer satisfaction is related to four factors: empathy, ease of use, information quality, and accessibility. Users perceived service quality as the most effective indicator to model portal customer satisfaction.

Chiung-Ju & Hui-Ju (2009) aimed to study about impacts of website quality on customer relationship performance. The study develops and empirically tests a model examining the relations between website quality, customer satisfaction, customer trust and customer relationship length, depth and breadth with the online financial services. Using survey data from 656 online customers of a Taiwanese securities corporation, results indicate that website quality influences customer satisfaction and trust, except for the link between information quality and customer trust, and customer trust has a stronger impact on relationship depth and breadth than customer satisfaction. Integrating the results, the study concludes that website information quality is the most important factor in enhancing relationship length, while website system quality and service quality contribute a lot to relationship depth and breadth.

Excimirey et al.(2013) studied on investigating the impact of website quality on consumers' satisfaction in Jordanian telecommunication sector. They examined the impact of websites quality (which was measured by usability, information quality and service interaction) of four major Jordanian telecommunication organizations on the consumer's satisfaction. Survey results of 84 students, from the faculty of planning and management at Al-Balqa' Applied University, have been collected and then analyzed using descriptive statistics and hierarchical regression. The results of the study showed that the usability and services interaction were highly significant factors that directly affected the consumers' satisfaction according to the testing model.

Similarly Saha & Zhao(2005) in their study entitled "Relationship between online service quality and customer satisfaction a study in internet banking." The purpose of the research was to gain better understanding of the service quality dimensions that affect customer satisfaction in the

internet banking sector from a customer perspective. Based on the detailed literature review; a frame of reference was developed. Five service quality dimensions were selected to be tested in the internet banking sector in order to explore the relationship between service quality and customer satisfaction. A qualitative research approach was used to get better understanding of this issue. However a small quantitative survey was also conducted to support the results obtained from qualitative study. The empirical data was gathered thorough in depth interviews with four people by using semi-structured questionnaire and a survey were conducted with 25 people.

The results shows shat nine service quality dimensions in internet banking were identified in this study(i.e. efficiency, reliability, responsiveness, fulfillment, privacy, communication, personalization, technology update and logistic/technical support). The quality performance of all the nine dimensions was shown to have a strong impact on customer satisfaction. Efficency, reliability, responsiveness, fulfillment, privacy was found to be the core service quality dimensions in Internet banking. Finally, technology update and logistic/technical support was two new dimensions found in this study.

Boling & Zazelenchuk (2003) conducted a research on considering user satisfaction in designing web based portals. Forty-five undergraduate schools of education students participated, completing a series of tasks that required locating information personalizing the portal system. Specifically students had to locate certain channels of information such as their course schedule or campus newspaper, add to their portal pages and change the arrangements of certain channels on their pages to match a given sample. At the end they asked their reason or a rationales for rating the system as they did. A content analysis of the transcripts revealed seven common rationales that suggest important design considerations for web based enterprise portals. Those are perceived utility, clear and helpful instructions, efficiency of use, everything in its place, the paradox of information quantity, feedback and confusing terminology.

Ajoye (2014) researched on “Information systems user satisfaction: a survey of the postgraduate school portal, university of ibadan, Nigeria”:

They investigate how information system IS measures (such as system quality, information quality, service quality, technological/infrastructural issues, users’ IT self-efficacy) influence user satisfaction of the university of Ibadan postgraduate school portal using a conceptual model

adapted from Delone and McLean (2003): A descriptive survey was employed as the research design in the study. Self-structured questionnaires based on the adapted model were administered as data collection instrument. A sample size of 385 students was drawn and same copies of questionnaire were distributed proportionally to postgraduate students across the 19 faculties of the postgraduate school. The data was analyzed using descriptive and inferential statistics. The result shows that system quality, information quality, service quality and infrastructural issues were significant predictors of users satisfaction, however, none of the IS measures predicted favorable on users' IT self-efficacy.

Lee, Choi, & Jo (2009) in their study, titled "Determinants Affecting User Satisfaction with Campus Portal Services in Korea":

Assess the relationships between end-user satisfaction with campus portal services and the degree of influence of this factor. In this study, user's satisfaction with campus portal services was determined by assessing end user satisfaction factors, in accordance with the method developed previously by Doll and Torkzadeh. Additionally, user ability, playfulness, design, and support service were established as preceding factors influencing user satisfaction. A survey was conducted with business school students of Sahmyook University in order to assess students' satisfaction and its factors relevant to campus portal services. The results of this study showed that user ability, playfulness, design, and support service influence user satisfaction.

Urbach et al., (2010) wrote a paper on "Industry-Specificity of Employee Portal Success: A Multi-Group Comparison". They introduced a theoretical model based on the DeLone and McLean IS Success Model, which considers the specific requirements of employee portals. They tested the associations between their model's different success dimensions by using more than 6,000 employees' responses that were collected in a survey of 22 companies across different industries participating in an international benchmarking study. Furthermore, they analyzed potential industry differences by means of a multi-group comparison. They applied structural equation modeling to carry out the data analysis. The study's results indicate that, besides the factors contributing to the success of IS in general, other success dimensions – like the quality of the collaboration and process support – have to be considered when aiming for a successful employee portal. The results of the multi-group comparison further indicate that the impacts of

the success factors differ in intensity and significance between the industries in their sample. The study's findings made that possible for practitioners to understand the industry-specific levers with which to improve their employee portals and to prioritize their investments accordingly.

Syed et al.(2017) have done a research on factors influencing students' usage satisfaction toward university web portal: A Pls-Sem Analysis. The study tested seven hypotheses on factors affecting users' satisfaction of university portal with empirical data from a sample of 318 students from University Kebangsaan Malaysia. Data were collected through personal-administered questionnaire. Partial Least Square (PLS) analysis results revealed that system quality, information quality, service quality, user ability, and educational services were significantly influence users satisfaction. Information quality was found as the dominating factor in this research.

Abdel, Hamza, & Abuhamad (2015) in their study entitled on" Exploring students' satisfaction with universities' portals in developing countries a cultural perspective": The purpose of the paper is to investigate the factors affecting students' satisfaction with university portals in developing countries. The factors examined are educational services availability, user ability, system quality and information quality. A self-completion questionnaire was developed and distributed to a sample of 550 students in several universities. Correlation and regression analysis were used to identify relationships and explore which of the factors the strongest explanatory power. The results had showed that educational services availability, system quality and information quality influence students' satisfaction, with service availability being the major determinant. The cultural perspective was employed to explain these results.

Liu, Du, & Tsai (2009) in their study entitled" A study of the service quality of general portals": They conducted two studies employing exploratory factor analysis and confirmatory factor analysis to identify an instrument to measure the service quality of general portals. The results indicated that the instrument is a four-factor model that includes adequacy of information, appearance, usability, and privacy and security. However, only the first two factors are significantly associated with customer satisfaction. Also, it was noted that Web page appearance was not significant for business portals but was for general portals.

Another study by Yu-Hui (2011) conducted a research on undergraduate's perceptions and use of the university libraries web portal. Data were collected through two rounds of survey over a period of an academic semester. Results showed that the information literacy course positively influenced participants' perceptions of the libraries web portal in terms of perceived ease of use, information quality, system quality, and user satisfaction. Yet, the course did not have an impact on their perceptions of service quality. In addition, statistically significant differences were not found in the overall frequency and duration of use, but in other dimensions of use, namely purpose and task.

A study on "Undergraduate Students Assessment of E-Portals in Selected Private Universities in South-West Nigeria" by Omotunde , Babalola , & Omotunde (2014).Multistage sampling technique was used to randomly select 1244 undergraduate students from the faculties of Social-Sciences and Management and Science and Technology in the selected universities. Data was collected with a self-structured questionnaire and analyzed using descriptive statistics and chi-square. The findings showed that the portal is used mainly for information purposes and rarely for core academic activities such as accessing e-learning programs, lecture notes or library materials. The major challenge student's face in using the portals was unstable internet connection. Information currency and accuracy is perceived to be low and some of the students had concern about the security of their transactions via the portal. Furthermore, over 50% of the respondents find the portals complex and needed technical assistance to use them effectively. The study therefore recommends that the university administration should provide more reliable internet service, ensure adequate user training and support services for students, regularly update the information on their portal and expand the usefulness of their portals to support academic activities.

2.8 Conceptual Framework

Based on the literature reviewed many authors used the updated D&M model to measure the user's satisfaction on web portal. As a result the researcher developed his own conceptual model to measure the studied variables because some of them are extended from the model. The updated D&M model has six interrelated constructs of information systems success measures but the new conceptual model includes eight constructs and the service quality variable was replaced by educational service availability. User ability and IT infrastructural issues were the new variables added to the D&M model.

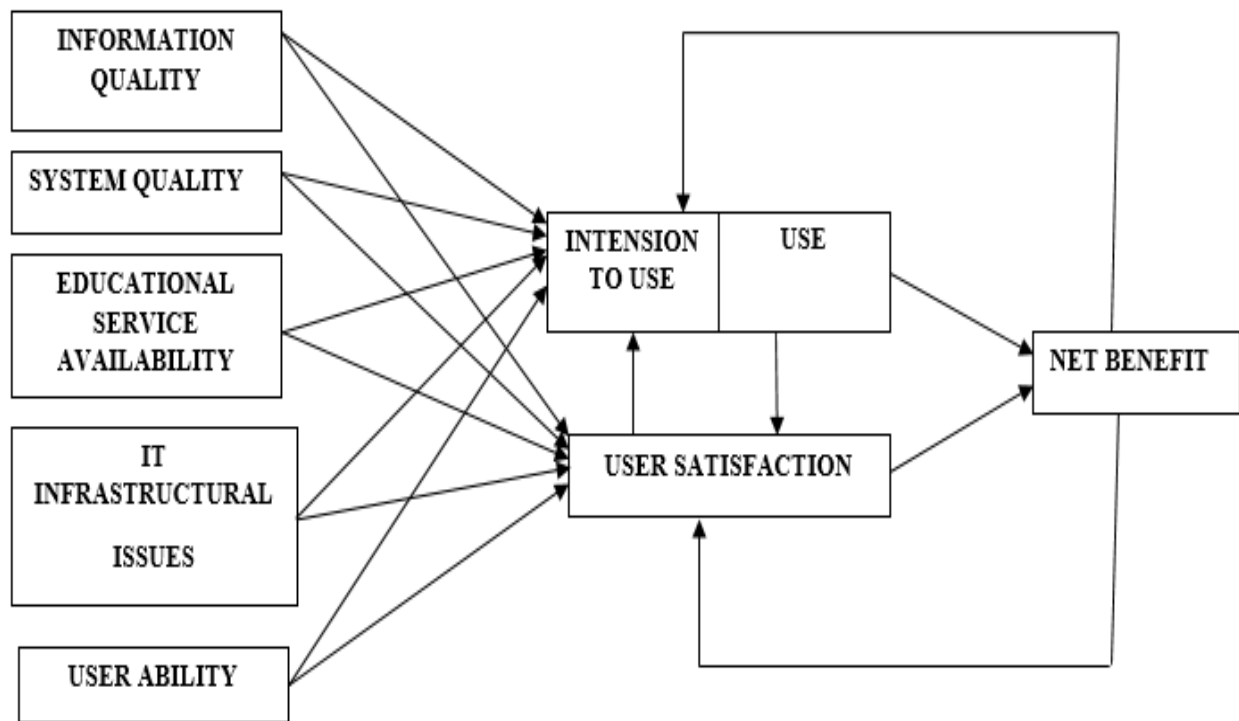


Figure 1 Conceptual Framework of Information System Success Model

2.9 Summary of the Chapter

The review of related literature shows that there are more issues to be studied in order to get more on information quality of the web portal by getting information from different levels. This study made the survey to address the research questions from all program levels.

The survey of literature exhibited that there is lack of conceptualized model used to measure all necessary users need in relation to user satisfaction of web based information system. As the researcher tried to show the related work in the last section of this chapter, many of the authors used DeLone and McLean model of information system success model to measure user's satisfaction but they extended the model in some cases. For this reason, the researcher also extended the model for some studied variables and then developed his own conceptual model.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The purpose of this Chapter is to present and discuss the approach and methods of the research. It covers the methodologies that have been followed in the study. The Chapter starts with Research model, which guided to define the factors associated with the study. Research method and strategy described next, followed by, the target population and sample size determination. Finally, the data analysis and interpretation methodologies have been discussed.

3.2 Research Model

This study is guided by the updated D&M model. The model offers six interrelated constructs of information systems success measures, that is, the quality dimensions (information, system, and service quality) which could affect subsequent use or intention to use and user satisfaction. It is also suggested that some benefits tagged as net benefits will be achieved as a result of use and/or user satisfaction. These net benefits could consequently affect user satisfaction and continued use of the system. The constructs and their operationalization in this study are further explained thus:

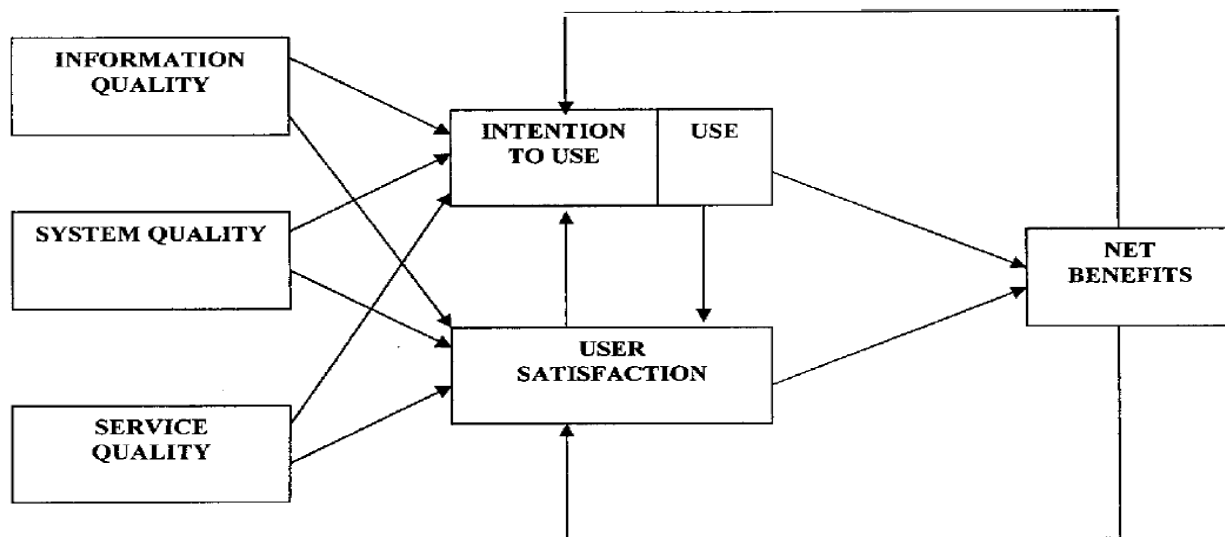


Figure 2 Updated D&M IS Success Model

- *System quality:* This is said to measure the desirable characteristics of an information system. Several IS studies have measured this using such characteristics as perceived ease of use, system features, response time, security and flexibility. Therefore, this study assessed these characteristics associated with the web portal of Addis Ababa university
- *Information quality:* This has to do with content issues and characteristics of the information systems output. It has been measured by examining the output of an information system in terms of timeliness, accuracy, reliability, and trustworthiness.

This study also operationalized information quality in terms of the accuracy, completeness, usefulness and timeliness of the information generated by the portal in use.

- *Service quality:* This is measured in terms of the quality of support rendered by the information system's developer. Studies have assessed this using service quality dimension, such as assurance and responsiveness by the systems support department, as well as the provision of user training. In this study the researcher does not consider about this because service quality is studied by many researcher independently.
- *Intention to use/Use:* This is concerned with assessing the manner in which an information system is used. Various studies have measured this by examining actual usage or sometimes, the frequency of use. The intention to use is said to be an alternative measure to use for some other context, depending on the nature of the information system.
- *User satisfaction:* This is considered one of the most important measures of systems success, often measured by overall user satisfaction. It was assessed in the study by capturing overall user satisfaction with the use of web portal
- *Net benefits:* This is also regarded as one of the most important measures of IS success, and it constitutes the extent to which an IS contributes to the success of various stakeholders, whether positive or negative. It has been measured by sometimes assessing individual impact or organizational impact. This study, however, examined net benefits as perceived net benefits, since primary users of the system were surveyed in this study.

3.3 Research Method and Strategy

For the purpose of this study, mixed method approach, which uses both qualitative and quantitative methods, was used. mixed method research is used as a research design (methodology) where the researcher collects, analyzes, and mixes both quantitative and qualitative data in a single study or a multiphase program of inquiry (Cresswell, 2003). Johnson et al. (2007) generally defines it as the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches for the main purposes of breadth and depth of understanding and corroboration. Similarly Webb et al. (1966) emphasized the use of mixed method strategy for enabling the researcher to go beyond the options that are available if a single research design is used. Attewell & Rule (1991) described it as a method that fulfills requirements of information technology research by providing adequate tools to gather and analyze different kinds of data. The strategy that the researcher followed was the qualitative data collected from experts and people who have awareness about the system was interviewed with semi-structured questionnaire and the quantitative data directly collected through administered questionnaire.

Kothari (2004) also put the basic research design considerations that any research should deal with during research design. Those are purpose of the study, type of study, Study Setting and Context and Time Horizon of the Study. Therefore, those things were include under the mind of the researcher.

3.4 Study Population and Sampling

Addis Ababa University has 50,771 students according to Addis Ababa University (AAU) enrollment statistics 2017/18 academic year (see appendix B for detail information). However, the target population for this research are Addis Ababa university student's particularly from college of business and economics and experts who are working on Addis Ababa university web portal. With recognizable variations, literature in the qualitative research area suggests sample sizes ranging from 3 to 30 (Creswell, 2003). While there appear no agreement on sample sizes, based on recommendations and discussions in qualitative research literature 3 respondents were selected from Addis Ababa university portal experts. The purposive convenience sampling was adopted, which is the most frequently used approach in qualitative studies (Kumar, 2005).

For the quantitative data, the data sources was students of college of business and economics in Addis Ababa University as shown in the table below;

Educational Level	Total number of students
Undergraduate	1954
Masters	401
PhD	67
Grand Total	2422

Table 1 Total Students statistics in College of business and Economics (Regular)

Source: Addis Ababa University (AAU) enrollment statistics 2017/18 academic years

Stratified sampling technique was useful to categorize the population in to three groups and then convenience sampling method was applied so as to select representative samples from the total or the reference population because the educational levels of the participants under consideration. Departments were selected based on the proportion of the total number of potential respondents existed in each group. Four departments (Department of Management, Department of Accounting, Department of Public Administration and Departments of Economics) students were participated. The lists of departments and the total number of students were obtained from the main registrar office of Addis Ababa University. The sample size was determined by the 2ndrule of thumb Size Formula, which is 95% confidence with a sampling error of $\pm 5\%$. Therefore, the following calculation (for 95% confidence, 5% error).

$$n=385 \div ((1+ (385/N))$$

Where: N, is the total population

So that the total sampled population is calculated as: $385/ ((1+ (385/2422)) =332$

Therefore, the total number of population sampled from each stratum is as shown in the table below:

Educational Level	Total number of students	Population sampled in percentage	Number of population sampled in figure
Undergraduate	1954	80.67%	268
Masters	401	16.5%	55
PhD	67	2.8 %	9
Grand Total	2422	100.00%	332

Table 2 Sample of population from each stratum

This represents 13.7 % of the population (2422). This number is considered sufficient due to time and cost factors.

3.5 Instrument Development

In order to obtain the required data a self-administered survey questionnaire is selected as the primary instrument. The survey is a widely used quantitative research which will enable an individual to get the required current data (Creswell, 2003). Among the many data collection tools, this study has applied the interview and questionnaire method as the main tool to collect all the relevant data from the reference population. The interview was conducted to three interviewees, selected based on the fact that they were responsible for administering the portal in the university. This was an adequate sample for interview as the information gained became saturated. The researcher used a semi structured in-depth interview with the selected interviewees. Semi-structured in-depth interviews are the most widely used interviewing format for qualitative research and can occur either with an individual or in groups. This allows the interviewer to investigate deeply into social and personal matters (Crabtree et al., 2006). The questionnaire is also considered appropriate because it enables the respondents (the university students) to complete it at a given time. The major attraction of using the questionnaire is the ability to collect large amounts of data in a relatively short time (Kothari, 2004).

The research question adapted from the constructs of Updated DeLone and McLean (2003) model used by Ajoye (2014), Questionnaire related to technological and infrastructural issues. The other questions related to information quality, system quality, educational service availability and user ability acquired from (Mohammed, 2012) that he used to collect the data from the respondents. This model can validate each variable because the model constructs by six dimensions; system quality, information quality, service quality, Intention to use/use, User Satisfaction and net benefits.

3.5.1 Questionnaire

The Survey questionnaire contained 40 questions (see appendix C). It has eight sections which were measured by a combination of nominal, ordinal and scales.

In the first Section, demographic information was collected with closed-ended questions (gender, age and educational level).

In the second Section, technical skills of the respondents were collected with closed-ended questions (Computer experience, Computer skills, internet experience and Internet skills).

In the third Section, measured the information quality through four dimensions (content, accuracy, timeliness and usefulness) and five items Likert-type scale. This section is relied on (Lee and Kim, 2010; Urbach et al. 2010; and Kuo et al. 2005) to determine the influence of information quality on student satisfaction with portals in Addis Ababa University.

The fourth Section measured the system quality through five dimensions and six items in Likert-type scale (design, navigation, support services, security & privacy, downtime). This section is relied on Urbach et al. (2010) to determine the influence of system quality on student satisfaction with universities portals in Addis Ababa University.

The fifth Section is measured the educational services availability by six dimensions (registration service, e-mail services, student's status system, research databases, e-learning gateway, social media links and communities) and eleven items in closed ended questions. This section is relied on (Lee, Choi, & Jo ,2009 and Urbach et al.2010) to determine the influence of educational services availability on student satisfaction with universities portals in Addis Ababa.

The sixth section measured the user's ability of web portal. Four items in Likert type scale. This this section was relied on Zviran et.al (2006) and Lee, Choi, & Jo (2009) to determine the influence of user ability on student satisfaction with universities portals in Addis Ababa.

The seventh section was covered the influence of IT infrastructural issue related student satisfaction. Three items in Likert-type scale measured the technological and infrastructural issues with university portal in general.

The last section (section eight) four items in Likert-type scale measured the overall student's satisfaction with university portal in general.

3.5.2 Pilot Testing

The questionnaire is tested in order to ensure to capture the required data as expected by the researcher. The test was conducted mainly to find out whether the questionnaire was easily-understandable as well as whether there were any vague and confusing questions in the questionnaire. Five students were approached to answer the questionnaire in the presence of the researcher. All the respondents reported that they have no difficulty in answering the questions. However, the researcher received one general comment from two students. Some of the questions needed additional choices like "Uncertain" for the closed ended questions in (section 3) and "Neutral" option for all likert scale questions. Accordingly, the author made necessary changes.

3.6 Data Collection Procedure

To collect data from the respondents the researcher got a written letter from school of information science. After that the researcher went to the registrar to find out list of departments, and number of students. Next to that the researcher went to each department and the researcher got permission. In addition, class schedule was also taken from the departments to know schedules of classes and to contact students while they were in class. Following, sample proportion for academic year of students was calculated and the questionnaire was distributed to the students with the help of department secretaries and class representatives. Thus the students had an interval, ranging from three days to one week, to return the questionnaire. Then both assistants collected the questionnaire and then return to the researcher. Participation was voluntary for all students.

3.7 Reliability

Reliability is assessed in terms of Cronbach's alpha coefficient. A scale is considered reliable if the alpha coefficient is greater than 0.70 (Sekaran, U.2005). In the case of this research, the reliability for all questionnaire items was satisfactory as values for Cronbach's alpha is 0.793.

3.8 Ethical Considerations

The necessary orientation about the purpose of the study was given to participants and consent obtained from each respondent. Those who were unwilling to participate in the study were omitted. No confidential information was collected.

3.9 Data Analysis

Data from the questionnaires were analyzed using the Statistical Package for Social Sciences 22 (SPSS) and the results interpreted by descriptive statistics and factor analysis .The data that gained through interview was used for further information for the purpose of conclusion and recommendations.

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

This study evaluated the factors that affect student satisfaction with university portal services for the case of Addis Ababa University. The study aims at laying a ground work for future researches that are aimed at identifying the factors that affects the students to use the system particularly web portals in the university. In addition to that, it enables the portal developers in other universities in Ethiopia to have a better understanding about student's need before the system was implemented.

This chapter starts by showing the Quantitative results in a simple descriptive statistics using mean, percentage and standard deviation to answer the research questions. Principal component analysis was undertaken in order to reduce components and to show how much the variables explained each factor and finally results was discussed in detail.

4.1 Descriptive Statistics

4.1.1 Profiles of Respondents

Out of the 350 questionnaires distributed, 314 responses were received. Given the likelihood that students in Addis Ababa University, especially undergraduate students, might not take the issue of filling up a survey seriously, a screening process was conducted to improve results quality; this included removing incomplete response and those who provided similar answers to the majority of questions, the result was 314 usable responses. Demographic findings showed a good representation of the sample in terms of gender and age. With regards to educational level, the overwhelming majority was studying for bachelor degree; details are provided in Table 3.

S/N	Variables	Categorization	Frequency	Percent
1	Gender	Male	218	69.4
		Female	96	30.6
2	Age	Less than 21	80	25.5
		21-25	169	53.8
		26-30	52	16.6
		30 and more than	13	4.1
3	Educational Level	Bachelor degree	257	81.8
		Masters	51	16.2
		PhD	6	1.9

Table 3 Profile of respondents

Table 3 shows the frequency and percentage distribution of respondents by age, gender, and educational level. The result shows that the total numbers of respondents male and females were (218, 69.4%) and (96, 30.6%) respectively.

More than half of the respondents 53.8% (169) were between 21-25 years and majority of the respondents were bachelor degree students (257, 81.8%).

4.1.2 Technical Skills of Respondents

Table 4 presents the results of descriptive analysis of technical skills and experience of respondents. It is clear that 36.6% (115) of the sample has 2-4 years of experience in using computer and 37.9% (119) of them have 2-4 years in using internet. Furthermore, both computer and internet skills of the respondents has good which is 56.1 % and 46.8% respectively.

No:	Variables	Categorization	Frequency	Percent
1	Computer experience	Less than 2 years	95	30.3
		2 – 4 years	115	36.6
		5 – 7 years	60	19.1
		More than 7 years	44	14.0
2	Computer skills	Low	63	20.1
		Good	176	56.1
		Very good	58	18.5
		Excellent	17	5.4
3	Internet Experience	Less than 2 years	70	22.3
		2 – 4 years	119	37.9
		5 – 7 years	77	24.5
		More than 7 years	48	15.3
4	Internet skills	Low	48	15.3
		Good	147	46.8
		Very good	87	27.7
		Excellent	32	10.2

Table 4 Technical skills of respondents

4.1.3 Opinion of Students for the Information Quality of Web Portal

Table 5 shows the participants agreement for questions related to information quality. The majority of respondents agreed that the information displayed on the portal is useful to students 77.1% (242). Above half of respondents agreed that availability of information on the university portal is rich 63.4% (199) and the university provides information related to students need 61.1% (192). However, 29.6 % (93) of respondents disagreed and 27.5% (86) are “Neutral “agreement on the information provided by the portal is up-to-date information. Generally, the information quality needs to give high attention based on the needs of all users.

Information quality of web portal	Agree	Neutral	Disagree	Mean	Standard deviation
Available information on the university portal is rich.	199(63.4%)	47(15.0%)	68(21.7%)	1.5828	0.82367
My university portal provides information related to my needs.	192(61.1%)	56 (17.8)	66(21.0%)	1.5987	0.81409
My university portal provides up-to-date information.	135 (43.0)	86 (27.4)	93(29.6%)	1.8662	0.84290
My university portal provides accurate information.	190(60.5%)	68 (21.7)	56 (17.8%)	1.5732	0.77669
Information displayed on the portal is useful to students.	242(77.1%)	45(14.3%)	27(8.6%)	1.3153	0.62377

Table 5 Information quality of web portal

4.1.4 System Quality of Web Portal

From the results on table 6 below, about 55.7% (175) of the respondents agreed that their university portals looks attractive in terms of colors and font and more than 59.6 % (187) consider the information was classified in to a simple way. However, 67.5% (212) of respondents disagreed on the available services working without problems and the web page load quickly 57.3 % (180). More than half of the respondents 57.6% did not agreed on the portal is available all the time due to low internet access but 62.4% (196) agreed that the personal information they provided is secured.

System quality of web portal	Agree	Neutral	Disagree	Mean	Standard deviation
Portal looks attractive in terms of colors and font.	175(55.7%)	74(23.6%)	65 (20.7)	1.6497	0.80228
Information was classified into specific categories in a simple way.	187(59.6%)	64(20.4%)	63(20.1%)	1.6051	0.80142
All the available services are working without problems.	47(15.0%)	55(17.5%)	212 (67.5%)	2.5255	0.74193
The personal information I provided is secured.	196(62.4%)	77(24.5%)	41 (13.1%)	1.5064	0.71606
Web pages loaded quickly.	74 (23.6%)	60 (19.1%)	180 (57.3%)	2.3376	0.83497
Portal is available all the time.	60 (19.1%)	73 (23.2%)	181(57.6)	2.3854	0.78803

Table 6 System quality of web portal

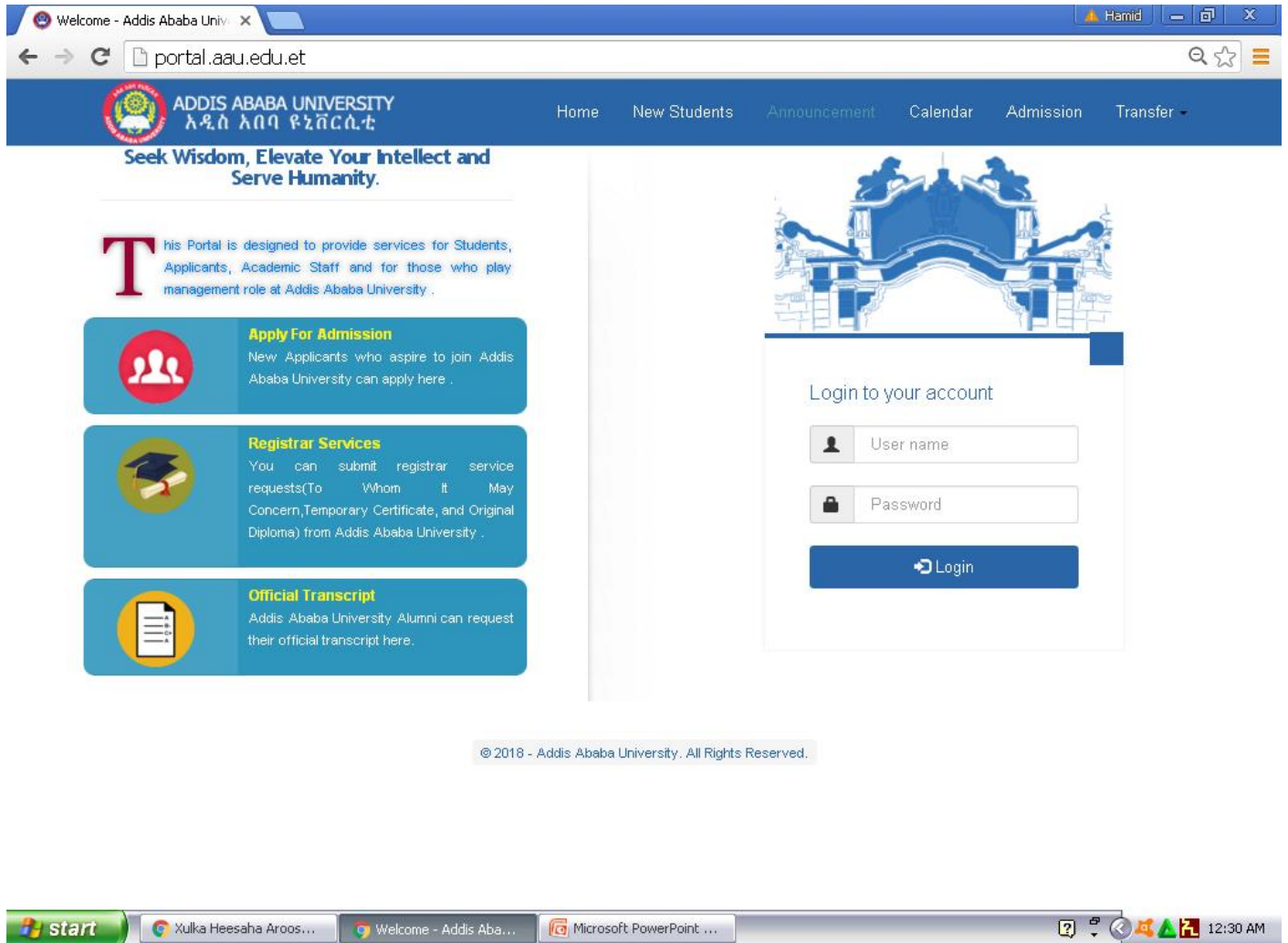


Figure 3 Log-in page of AAU web portal

4.1.5 Educational Service Availability of Web Portal

Table 7 illustrates that most of the respondents use their university portals to apply for registration services 93.0 % (292) as shown in figure 3 of next page. For the other questions the majority of respondents replied either “no” or “uncertain” responses. This disagreement due to two reasons; the first reason is the system is still in the development phase therefore some services are not working. The other is the students have not an awareness or training about what the services are provided by the portal.

Educational service availability	Yes	No	Uncertain	Mean	Standard Deviation
Registration service is provided on the portal.	292(93.0%)	11 (3.5%)	11 (3.5%)	1.1051	0.40576
Grade change request is available on the portal.	149(47.5%)	101(32.2%)	64(20.4%)	1.7293	0.77910
Portal contains an electronic library to help students in scientific research.	97 (30.9%)	142(45.2%)	75(23.9%)	1.9299	0.73797
Lost id services available on the portal.	58 (18.5%)	151(48.1%)	105(33.4%)	2.1497	0.70590
Portal contains an e-learning management system.	57 (18.2%)	134(42.7%)	123(39.2%)	2.2102	0.72853
Make up request available on the portal.	72 (22.9%)	144(45.9%)	98(31.2%)	2.0828	0.73229
The portal is linked with social networks.	103(32.8%)	119(37.9%)	92(29.3%)	1.9650	0.78853
The portal provides e-mail service to students.	101 (32.2%)	122(38.9%)	91(29.0%)	1.9682	0.78256
The portal links with community portal (for parents and employees) to follow up their students.	67 (21.3%)	158(50.3%)	89(28.3%)	2.0701	0.70248
The portal provides contact address for help and assistance.	123 (39.2%)	107(34.1%)	84(26.8%)	1.8758	0.80366
Courses add and drop services provided on the portal.	155 (49.4%)	92(29.3%)	67 (21.3%)	1.7197	0.79402

Table 7 Educational service availability of web portal

The screenshot displays the 'Basic Information' page on the AAU web portal. The page header includes the university's logo and name in Amharic and English, along with the motto 'Seek wisdom, Elevate Your Intellect and Serve Humanity'. The navigation menu on the left lists various services such as Registration, Grade & Results, and Student Services. The main content area shows the following user information:

Full Name	Kedir Abdu Seid	Department	School of Information Science
ID No.	GSR/2645/09	Year	Year II

Below this, there are input fields for:

- Nationality:** Ethiopian
- Telephone:** 0923660751
- Email:** kedirabdu495@gmail.com
- Date Of Birth (GC):** Year: 1992, Month: May, Date: 20

A **Photo Preview** section shows a placeholder image with the text 'Allowed Image Formats (JPEG, PNG, GIF, JPG) (Passport size)' and a 'Bladeren...' button. A 'Submit' button is located at the bottom of the form. A red banner at the bottom of the page reads 'Please Click Here >> To Complete Your Profile'. The browser's address bar shows the URL 'https://portal.aau.edu.et/StudentRecords/BasicInformation'.

Figure 4 Registration services of AAU web portal

4.1.6 User Ability of Web Portal

Table 8 shows that the user's ability to use the system. The results revealed that 66.2 % (208) of users agreed that they have the ability to carry out basic research on the internet and 78.7 % (247) of users said that they have the ability to download programs from the internet and save it on a computer. They also confirm that 197(62.7%) of the respondents have the ability to use the majority of basic functions offered in windows operating system. However, 29.9% (94) of respondents they can't fix alone when minor problem occur in their computers

User ability of web portal	Agree	Neutral	Disagree	Mean	Standard deviation
I have the ability to carry out basic research on the Internet.	208 (66.2%)	51(16.2%)	55(17.5%)	1.5127	0.77593
I have the ability to download programs from the Internet and save it on a computer.	247 (78.7%)	38(12.1%)	29(9.2)	1.3057	0.63106
I have the ability to use the majority of basic functions offered in Windows operating system.	197 (62.7%)	65(20.7%)	52(16.6%)	1.5382	0.76263
When I am having a minor problem with my computer, I can fix it alone.	144 (45.9%)	76(24.2%)	94(29.9%)	1.8408	0.85729

Table 8 User ability of web portal

4.1.7 Technological / IT Infrastructural Issues of Web Portal

Table 9 below revealed technological and IT infrastructural issue often faced by students using e-portals. 70.4 % (221) of students agreed that unstable power supply is a major challenge to use the portal and the university portal is very slow and need to be upgraded. In addition to this 74.8 % (235) of participants agreed that lack of sufficient internet facilities around the university limits to use the portal. The result further showed that Technological / IT infrastructural issues are the key factors before implementing the new system.

Technological / IT infrastructural issues of web portal	Agree	Neutral	Disagree	Mean	Standard deviation
Unstable power supply is a major challenge to use the portal.	221(70.4%)	64(20.4%)	46(14.6%)	1.4968	0.73805
The university portal is very slow and need to be upgraded.	221 (70.4%)	55(17.5%)	38(12.1%)	1.4172	0.69766
Lack of sufficient internet facilities around the university limits to use the portal.	235 (74.8%)	40 (12.7%)	39(12.4%)	1.3758	0.69608

Table 9 Technological / IT infrastructural issues of web portal

4.1.8 Overall Student Satisfaction of Web Portal

From the results on table 10, 63.4 % (199) of respondents are satisfied on information quality displayed on the portal and majority of the respondents also satisfied on the overall system quality of university portals 57% (179). But 42.4%(133) respondents are disagreed and 20.1%(63) have "neutral" responses for the quality of educational service availability on the university portal. Even though the students are dissatisfied on educational service availability on the university portal, above half percent or 66.6 % (209) of students agreed their colleges to use the university portal continuously.

Overall student satisfaction of web portal	Agree	Neutral	Disagree	Mean	Standard deviation
I feel satisfied with the quality of information provided through my university portal.	199 (63.4%)	75(23.9%)	110(35.0%)	1.9395	0.87173
I feel satisfied with the system quality of my university portal.	179 (57.0%)	74(23.6%)	115(36.6%)	1.9682	0.87507
I feel satisfied with the service quality of my university portal.	118(37.6%)	63(20.1%)	133 (42.4%)	2.0478	0.89422
I advise my colleagues to use the university portal continuously.	209 (66.6%)	64(20.4%)	41(13.1%)	1.4650	0.71523

Table 10 Overall students' satisfaction of web portal

4.2 Factor Analysis

4.2.1 Principal Component Analysis

For factor analysis, the researcher analyzed only four factors namely; information quality, system quality, technological and IT infrastructural issue and user ability. However, educational service availability is not going in to factor analysis because the questionnaire are not appropriate for this analysis. Therefore, that was explained by descriptive analysis rather than factor analysis.

The first step in PCA is determining the number of components to be identified. These components are likely the ones that have been influencing the student's satisfaction that affect the use of web portal for Addis Ababa University. First, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was calculated for a test of fitness. Kaiser & H. F.(1974) argued if the KMO is less than 0.5, factor analysis is inappropriate. The KMO value of this research is 0.740. This clearly suggests that factor analysis can be used to extract research factors. The Bartlett sphere test is also significant at the level of 0.000 (table 11). In order to reduce the natural stance of variables being correlated to some extent despite the varying nature of concept they represent, oblique rotation method with Direct Oblimin was employed in order to reduce the natural effect. Oblique rotation unlike orthogonal rotation allows for the components to be correlated. However, this oblique rotation can also yield in orthogonal solution, therefore, oblique rotation method was used.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.740
Bartlett's Test of Sphericity	Approx. Chi-Square	1195.903
	Df	153
	Sig.	.000

Table 11 KMO and Bartlett's Test

Several rules are typically applied when addressing how many factors are to be extracted. To obtain a meaningful or interpretable grouping of the variables, the researcher employed the rule of an eigenvalue greater than 1, the percentage of variance extracted accounts for at least 5% of the common variance, and the factor loading is greater than 0.5.

Table 12 shows the total variance explained. In this study, five components recorded eigenvalues of greater than one (3.782, 2.161, 1.583, 1.233 and 1.083). These five components explain a total of 54.68 percent of the total variance.

4.2.2.1 Component Matrix

Component matrix, presented in table 13 shows each variable's loadings on each component before rotation is applied. This result only shows each item's loadings on each component, which doesn't show conceptual meaning and is very difficult to interpret, hence, rotation is required to yield a more interpretable and meaningful patterns. Therefore, by applying oblique rotation method with direct oblimin, principal component analysis yielded the following solutions as shown in table 14. The higher the load, the more important it is in defining the factor's dimensionality. A negative value indicates an inverse impact on the factor. Four factors load in Component 1(0.832, 0.735, 0.726, and 0.521) and Component 2(.760, 0.759, 0.753, and 0.701). Three factors load in Component 3 (0.727, 0.658, and 0.606), Component 4 (0.774, 0.710, and 0.647) and Component 5 (0.731, 0.648, and 0.548).

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.782	21.013	21.013	3.782	21.013	21.013	2.755
2	2.161	12.006	33.020	2.161	12.006	33.020	2.420
3	1.583	8.792	41.812	1.583	8.792	41.812	1.641
4	1.233	6.852	48.663	1.233	6.852	48.663	2.271
5	1.083	6.016	54.679	1.083	6.016	54.679	2.146
6	.970	5.389	60.068				
7	.910	5.055	65.124				
8	.887	4.928	70.051				
9	.758	4.209	74.261				
10	.714	3.965	78.226				
11	.634	3.523	81.749				
12	.617	3.428	85.176				
13	.563	3.125	88.302				
14	.512	2.845	91.147				
15	.482	2.680	93.827				
16	.390	2.165	95.992				
17	.379	2.104	98.095				
18	.343	1.905	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 12 Total variance explained

	Component				
	1	2	3	4	5
Available information on the university portal is rich.	.656				
My university portal provides information related to my needs.	.586				-.587
My university portal provides up-to-date information.	.651				
My university portal provides accurate information.					
Information displayed on the portal is useful to students.			.544		
Portal looks attractive in terms of colors and font.	.574				
Information was classified into specific categories in a simple way.	.574				
All the available services are working without problems.					
The personal information I provided is secured.					
Web pages loaded quickly.	.583				
Portal is available all the time.	.530				
I have the ability to carry out basic research on the Internet.		.590			
I have the ability to download programs from the Internet and save it on a computer.		.612			
I have the ability to use the majority of basic functions offered in Windows operating system.		.689			
When I am having a minor problem with my computer, i can fix it alone.		.672			
Unstable power supply is a major challenge to use the portal.					
The university portal is very slow and need to be upgraded.			.567		
Lack of sufficient internet facilities around the university limits to use the portal.				.562	

Extraction Method: Principal Component Analysis.

a. 5 components extracted.

Table 13 Component Structure Matrix (Before)

	Component				
	1	2	3	4	5
Available information on the university portal is rich.	.735				
My university portal provides information related to my needs.	.832				
My university portal provides up-to-date information.	.726				
My university portal provides accurate information.	.521				.548
Information displayed on the portal is useful to students.					.731
Portal looks attractive in terms of colors and font.					
Information was classified into specific categories in a simple way.					
All the available services are working without problems.				.774	
The personal information I provided is secured.					.648
Web pages loaded quickly.				.647	
Portal is available all the time.				.710	
I have the ability to carry out basic research on the Internet.		.760			
I have the ability to download programs from the Internet and save it on a computer.		.753			
I have the ability to use the majority of basic functions offered in Windows operating system.		.759			
When I am having a minor problem with my computer, i can fix it alone.		.701			
Unstable power supply is a major challenge to use the portal.			.606		
The university portal is very slow and need to be upgraded.			.658		
Lack of sufficient internet facilities around the university limits to use the portal.			.727		

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

Table 14 Component Structure Matrix (after)

4.2.2.2 Component Inter Correlations

Table 15 presents the component correlation matrix. It is a matrix that shows the inter correlations among components. It shows that there is a weak correlation between the components.

Component	1	2	3	4	5
1	1.000	.105	-.087	.251	.276
2	.105	1.000	.055	.124	.091
3	-.087	.055	1.000	-.135	-.034
4	.251	.124	-.135	1.000	.134
5	.276	.091	-.034	.134	1.000

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Table 15 Component Correlation Matrix

Factors	Items	Loadings	Total Variance Explained
Information Quality	Q8.1 My university portal provides information related to my needs	0.832	21.013%
	Q8.0 Available information on the university portal is rich	0.735	
	Q8.2 My university portal provides up-to-date information	0.726	
	Q8.3 My university portal provides accurate information	0.521	
User ability	Q8.22 I have the ability to carry out basic research on the Internet.	0.760	12.006%
	Q8.24 I have the ability to use the majority of basic functions offered in Windows operating system.	0.759	
	Q8.23 I have the ability to download programs from the Internet and save it on a computer.	0.753	
	Q8.25 When I am having a minor problem with my computer, I can fix it alone	0.701	
Technological/ IT infrastructural issues	Q8.28 Lack of sufficient internet facilities around the university limits to use the portal	0.727	8.792%
	Q8.27 The university portal is very slow and need to be upgraded	0.658	
	Q8.26 Unstable power supply is a major challenge to use the portal.	0.606	
System quality	Q8.7 All the available services are working without problems.	0.774	6.852%
	Q8.10 Portal is available all the time.	0.710	
	Q8.9 Web pages loaded quickly.	0.647	
Information quality and System quality factors	Q8.4 Information displayed on the portal is useful to students. Q8.8 The personal information I provided is secured Q8.3 My university portal provides accurate information.	0.731 .648 .548 .	6.016%

Table 16 Factor loading for principal factor analysis.

4.3 Qualitative results

The qualitative approach was conducted by interviews with different participants who are the experts of the web portal in Addis Ababa University.

Literature suggests minimum sample size for qualitative studies based on the research design. The major ones includes, 3-5 participants for case studies (Creswell, 2002). Therefore, in this research 3 experts was involved for the interview session.

In the process of data collection, the researcher first explained the purpose of the research and got the respondents' agreement to participate in the research. All portal experts were interviewed by the researcher, for between 10 and 20 minutes. All interview responses were short noted, with the consent of the respondents.

The reporting style followed is an interpretive qualitative research reporting model where a summary of findings are presented followed by illustrative quotes of respondents and interpretations of the researcher.

This section presents findings of qualitative data analysis related to the five factors; information quality, system quality, educational service availability, user ability and IT infrastructural issues from experts point of view to generalize the findings of survey results.

The interview processes were started with one general questions to know general information about the web portal of Addis Ababa University. *Who develop the web portal of Addis Ababa University?* In responding to the this question, the web portal of Addis Ababa university was developed by National Marketers Private Limited Company (PLC). Which is mainly developed to enhance the information management of Addis Ababa university students ,staffs ,and those whom play management role. After the researcher asked this question as an introduction, he summarized the interview results for each factors of the studied variables in the following sections.

Information Quality

The findings of interview results showed that the information displayed on the portal is rich, useful, accurate and related to student's need. In addition to this, the researcher was asked the question; *does the system provide up-to-date information?* In responding to this question, the project manager explained that the information displayed on the portal is often up to date. Sometimes the information may not be update due to forgotten of the life of the information that should be deleted or updated by the current information.

System Quality

The system quality of the web portal is measured in terms of (Design, Navigation, Support services, Security& privacy, downtime).The researcher asked two questions in relation to system quality. *Do you have any mechanism to check the system running without problems? Did you upgrade the portal regularly?* Two the respondents replied that:

No, we have not any software application to check the system are working or not working without problems but we try to see the system manually as every user of the university.

For the second question associated to the upgrade of the system the project manager of the web portal said that:

Yes, I personally upgrade the system regularly. Therefore, new features and services are provided to the users.

Educational service availability

The findings of the interview data revealed that students' satisfaction influenced by the number of educational and non-educational services offered on the portal, such services/e-services include student's status system (e.g. grades and attendance record), learning management system (e.g. lecture notes), registration service, email services, databases (online library service), lecturer evaluation and social media communities (e.g. Facebook, Twitter and Email services). University portals can effectively facilitate access to services and reduce unnecessary bureaucracy associated with traditional ways of services provision. Furthermore, University portals can speed up administrative processes, provide a flexible approach in conducting

transactions and allow users to perform individualized self-services (Bajec, 2005). Therefore, the researcher asked three questions related to educational service availability. *Is the system integrated with e-learning management systems?* The project manager of AAU web portal respond to this question is that:

No, this very interesting observation of the web portal. Therefore we will integrate to educational services in order to help the students to access all necessary sites and web portals of other countries to enhance the student's competitiveness with the students of the entire world.

As a result, students are expected to be satisfied when more services are available on the portal

User Ability

The project manager and the admission team leader suggested that computer professionals should prepare voluntary training (support services) to students in the university especially for social science students. This finding is supports the findings of (Lee, Choi, & Jo, 2009). They further explained that portal should be compatible with different user ability of the students. The admission team leader answered the question” *Do you believe that the system is easy to use?* “:

Yes, because each of the students has a minimum of basic computer skill of using some functions of windows operating system and an ability to browse and search information in the World Wide Web (Google.)

Technological / IT Infrastructural Issues

The findings of the interview result shows that the infrastructural issues are the big challenges that affect user satisfaction of the web portal in Addis Ababa University. And it is the real time we find a permanent and sustainable solution to poor power supply and internet connectivity.

4.4 Summary of Analysis Results

From the results above, the descriptive analysis showed that information quality, system quality; educational service availability, user ability and IT infrastructural issue were the factors that affect the student's satisfaction towards the use of web portal in Addis Ababa University. However, educational service availability and IT infrastructural issue were the dominating factor in this research.

The qualitative (Interview) results discovered that the information displayed on the portal is rich, useful and accurate but sometimes the information is not update regularly. In terms of system quality, the system is qualified but the experts not sure the system is always running without problems. The web portal also not integrated with educational services and some interested social media links. In case of user ability, the experts agreed that the computer professional expected to provide training to the students before starting to use the web portal. Unsustainable power supply and lack of sufficient internet connection are the major IT infrastructural issues in Addis Ababa University.

On the other hand the factor analysis results used to show how much each variable explained the studied factor and to reduce many individual items into a fewer numbers of dimensions.

4.5 Discussion

The purpose of this study is to explore the determinant factors of student satisfaction with university portal services in Addis Ababa University. This helps for the system developers to identify significant factors for the design of university portal services, focusing on end users. It also helps to facilitate future upgrades or re-designs of university portal systems. Furthermore, all Ethiopian universities may use this study as a baseline to implement web portal in their university because they have similar educational culture.

On the basis of the results, the researcher concludes with the following points.

Information Quality

Majority of the students are satisfied by the information provided by the portal. This may be explained by assuming that, students are interested in performing certain tasks like registration and obtaining marks, while certain information only gathered through the portal. These results demonstrate that the web content should be personalized, complete, useful, easy to understand,

accurate and up to date to make the students satisfied. This finding in line with the findings of Syed et al.(2017). The project manager and the admission team leader also agreed with this idea and they believe that the system provided up to date information. However, 57.0 %(179) of students didn't agreed. Even through the system has its own weaknesses; both the project manager and the admission team leader and majority of the students convinced that the system is qualified in terms of information quality.

System Quality

The system quality measures by many dimensions. Such as, ease of use, access, response time and etc. Above half percent of the students 57.0 %(179) are satisfied in terms of system quality. The project manager said that the university portal is easy to use by all levels of students because the university assumed that all students have basic computers skill. This result contradicts that of Omotunde , Babalola , & Omotunde (2014). The system also very secured and upgraded regularly. Some students blame that the portal has not any contact address or guideline that provides to students for help and assistance. Furthermore, the system is not working without problems and services are not available due to limited internet access.

Educational Service Availability

Most of the university portals in the world such as Jordan, Nigeria and Korea are linked with educational services. However, the student's survey result revealed that our university portal is not integrated with educational services such as, email services, e-learning management systems, social networks and etc. Therefore, educational service availability in this case is the major factor that influence user satisfaction. This finding affirm that of the findings of Ajoye (2014) and Abdel, Hamza, & Abuhamad (2015) The Project manager said that not only the system is not integrated with educational services is a problem but also the students have not an awareness about what services provided by the portal. Therefore, students need a formal training before using the system.

User Ability

User ability is the main consideration before implementing the system. The students in College of business and economics have the ability to use the portal. Their survey results showed that majority of respondents have the ability to carry out basic research on the internet and the ability to download basic function on the internet but they can't fix alone when a minor problem occur in their computers. A university portal can be viewed as an interactive learning environment for students. Therefore, it is important to increase their abilities to learn how to browse and use the portal. Although campus portals provide a great deal of good information, the efficacy of campus portals will decrease if user ability does not meet the appropriate level (Liu et al., 2009), Traditionally, user ability is considered a motivation for system use.

Technological / IT Infrastructural Issues

Students ,the Project manager and the Admission team leader confirm that the technological and IT infrastructural issue in the university are ; lack of sufficient internet facilities around the university and lack of computer laboratory rooms for providing training to students are limits to use the portal. Due to this reason the students are dissatisfied with the university portal.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In this study, the researcher evaluated the factors affecting student's satisfaction with university portal services; information quality, system quality, educational services availability, user ability, technological / IT infrastructural issues are the factors that influence student's satisfaction in Addis Ababa University but educational services availability and technological / IT infrastructural issues are the dominating factors.

My findings demonstrate that the students will be satisfied if the system output is friendly secured, easy to use and visibly attractive to the users. It should be compatible with different levels of ability of the users. Also, the students will be satisfied depending on the quality and availability educational services provided by universities.

The Descriptive results showed that about 93.0% (292) of students uses the university portal for registration. As the project manager reported that some services are not working because of the system is in the testing phase and lack of awareness by the students about what services provided by the web portal. This problems will fix by fully implemented by the web portal and by providing formal training and guideline to the students.

5.2 Recommendations

On the basis of study results and researcher conclusions, he suggests the following recommendations to meet the study objectives:

- Ensuring adequate training and user support services for students rather than assuming that students are deft with technologies.
- Regularly updating the information on their portals.
- The university should pay high attentions for the Technological / IT infrastructural issues especially for internet access and sustainable power supply in the university.
- The portal should be integrated with educational services and social Medias to access everything in one place.

5.3 Future Work

This study, however has several weaknesses. First, the use of descriptive analysis did not produce many significant findings. Second, the sample size of the study was limited to only regular students in collage of business and economics. Third, the number of factors employed in this study is also limited compared to similar studies by Urbach et al. (2010) and Ajoye (2014). Based on these limitations, the researcher would like to propose refinements to future research. Instead of using Descriptive statistics, perhaps future research should consider the regression and correlation analysis between each factors.

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Appendices

Appendix A: Letter for Data Collection

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የተፈጥሮ ሳይንስ ኮሌጅ
የኢንፎርሜሽን ሳይንስ ት/ቤት



ADDIS ABABA UNIVERSITY
College of Natural Science
School of Information
Science

Date March 26,2018

Ref: -SIS/13/2010

To Whom It May Concern

Student Kedir Abdu (ID.No. GSR/2645/09) is a graduate student at the School of Information Science, Addis Ababa University. He is currently conducting a MSc. thesis research under the title “Determinant Factors of Student Satisfaction with University Portal Services for the Case of Addis Ababa University”.

I would like to thank you in advance for all the assistance that you would provide to the student.

With Regards,

Martha Yihru (PhD)
Head, School of Information Science



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Appendix B: Addis Ababa University (AAU) Enrollment Statistics 2017/18 Academic Year

**ADDIS ABABA UNIVERSITY
OFFICE OF THE REGISTRAR
ENROLLMENT SUMMARY
FIRST SEMESTER 2017/18/ACADEMIC YEAR (2010 E.C)**

COLLEGE/INSTITUTE	UNDERGRDUATES										POSTGRADUATE								GRAND TOTAL		
	REGULAR			EXTENSION		Distance		SUMMER			REGULAR		EXTENSION		Distance		SUMMER				PHD
	F	T	%	F	T	F	T	F	T	F	T	F	T	F	T	F	T	F	T	F	T
AAU G.TOTAL	8,868	16,479	100	3,416	8,792	21	53	2,314	6,809	1,728	6,754	1,320	5,447	328	854	668	3,078	254	2,905	15,917	50,771
Addis Ababa Institute of Technology	1,145	4,338	28	381	2,099					317	1,252	157	839					19	240	2,019	8,768
Ethiopian Institute of Arctecture Building Construction and Develoment	399	1,448	9	130	728					57	236	0	0					8	61	594	2,473
College of Natural Sciences	818	1,958	12	94	374			496	1,828	222	764	19	353			284	1,275	64	588	1,997	7,140
College of Health Sciences	1,166	3,064	19	445	686					579	2,508	104	364					11	186	2,305	6,808
College of Veterinary medicine and Agriculture	168	510	3	-	-			13	60	15	81					8	38	7	84	211	773
College of Business and Economics	680	1,954	12	1,941	3,649	21	53			131	401	398	1,717	272	679			7	67	3,450	8,520
College of Development Studies										72	235	87	395					11	128	170	758
College of Education and Behavioral Studies (CEBS)	162	354	2	124	255			914	3,121	78	225	343	928	41	139	48	255	11	214	1,721	5,491
College of Law and Governance Studies	125	313	2	65	298					57	270	15	77					2	43	264	1,001
College of Social Sciences	442	1,001	6	71	262			148	455	52	272	119	367	15	36	26	406	11	190	884	2,989
College of Humanities Language Studies Journalism and communication	537	887	6	66	155			696	1,212	79	259	78	407			302	1,104	61	399	1,819	4,423
SB College of Performing and Visual Arts	226	652	4	99	286			47	133	12	81	0	0					0	0	384	1,152
Institute of Research			-							57	170	0	0					42	305	99	475

SECTION TWO

Technical skills

4. How long have you been using computers?

1. Less than 2 years
2. 2 – 4 years
3. 5 – 7 years
4. More than 7 years

5. Computer skills

1. Low
2. Good
3. Very Good
4. Excellent

6. How long have you been using internet

1. Less than 2 years
2. 2 – 4 years
3. 5 – 7 years
4. More than 7 year

7. Internet skills

1. Low
2. Good
3. Very Good
4. Excellent

Questionnaire related to Information Quality, System Quality, Service Quality, User Ability and IT Infrastructural issue.

Indicate your agreement for the following statements. Tick your answer on the circle.

SECTION THREE	Statements	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
		1	2	3	4	5
8.0	Available information on the university portal is rich.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.1	My university portal provides information related to my needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.2	My university portal provides up-to-date information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.3	My university portal provides accurate information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.4	Information displayed on the portal is useful to students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.5	Portal looks attractive in terms of colors and font.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.6	Information was classified into specific categories in a simple way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.7	All the available services are working without problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.8	The personal information I provided is secured.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.9	Web pages loaded quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.10	Portal is available all the time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

		Yes	No	Uncertain
		1	2	3
8.11	Registration service is provided on the portal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.12	Grade change request is available on the portal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.13	Portal contains an electronic library to help students in scientific research.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.14	Lost id services available on the portal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.15	Portal contains an e-learning management system.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.16	Make up request available on the portal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.17	The portal is linked with social networks.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.18	The portal provides e-mail service to students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.19	The portal links with community portal (for parents and employees) to follow up their students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.20	The portal provides contact address for help and assistance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.21	Courses add and drop services provided on the portal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

		Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
		1	2	3	4	5
8.22	I have the ability to carry out basic research on the Internet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.23	I have the ability to download programs from the Internet and save it on a computer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.24	I have the ability to use the majority of basic functions offered in Windows operating system.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.25	When I am having a minor problem with my computer, i can fix it alone.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

		Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
		1	2	3	4	5
8.26	Unstable power supply is a major challenge to use the portal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.27	The university portal is very slow and need to be upgraded.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.28	Lack of sufficient internet facilities around the university limits to use the portal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.29	I feel satisfied with the quality of information provided through my university portal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.30	I feel satisfied with the system quality of my university portal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.31	I feel satisfied with the service quality of my university portal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.32	I advise my colleagues to use the university portal continuously.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9 Please feel free to give any other comments and suggestions.

Appendix D: Interview Questions

1. Who develop the system?
2. Does the system provide up-to-date information?
3. Do you have any mechanism to check the system running without problems?
4. Do you have any guideline or formal training program that given to students to use the system?
5. Is the web portal has any contact address for help and assistance?
6. Do you believe that the system is easy to use?
7. Is the system is integrated with e-learning management systems?
8. What are the factors that affect the usability of the portal related to IT infrastructure?
9. Did you upgrade the portal regularly?
10. Do you think that the portal is qualified in terms of information, system, and service quality? Why?

Appendix E: Summary of the Studies Related to Users Satisfaction

Focus of the study	Factors investigated	Author (year)
Considering user satisfaction in designing web based portals:	<ul style="list-style-type: none"> ▪ Utility ▪ Clear and helpful instructions ▪ Efficiency of use ▪ Everything in its place ▪ The paradox of information quantity ▪ Feedback and confusing terminology. 	Boling & Zazelenchuk (2003)
Measuring Users' Perceived Portal Service Quality – an Empirical Study	<ul style="list-style-type: none"> ▪ Empathy ▪ Ease of use ▪ Information quality ▪ Accessibility 	Kuo et al.(2005)
Relationship between online service quality and customer satisfaction a study in internet banking	<ul style="list-style-type: none"> ▪ Efficiency ▪ Reliability ▪ Responsiveness ▪ Fulfillment ▪ Privacy ▪ Communication ▪ Personalization ▪ Technology update ▪ Logistic/technical support 	Saha & Zhao (2005)
Determinants Affecting User Satisfaction with Campus Portal Services in Korea	<ul style="list-style-type: none"> ▪ User ability ▪ Design ▪ Playfulness ▪ Support services 	Lee,Choi, & Jo (2009)
Study of the Service Quality of general portals	<ul style="list-style-type: none"> ▪ Usability ▪ Privacy and security ▪ Adequacy of Information ▪ Appearance 	Liu, Du, & Tsai (2009)
A study of the impacts of website quality on customer relationship performance”	<ul style="list-style-type: none"> ▪ Website information quality ▪ Website system quality 	Chiung-Ju & Hui-Ju (2009)
Student User Satisfaction with Web-based Information Systems in Korean Universities	<ul style="list-style-type: none"> ▪ Information satisfaction ▪ System satisfaction 	Lee & Kim, (2010)

Industry-Specificity of Employee Portal Success: A Multi-Group Comparison	<ul style="list-style-type: none"> ▪ System quality ▪ Information quality ▪ Process quality ▪ Collaboration quality ▪ Service quality 	Urbach et al. (2010)
Undergraduates' Perceptions and Use of the University libraries Web portal	<ul style="list-style-type: none"> ▪ Ease of use ▪ Information quality ▪ System quality 	Yu-Hui (2011)
Investigating the Impact of Website Quality on Consumers' Satisfaction in Jordanian Telecommunication Sector	<ul style="list-style-type: none"> ▪ usability ▪ services interaction 	Excimirey et al.(2013)
Information systems user satisfaction: a survey of the postgraduate school portal, university of Ibadan, Nigeria	<ul style="list-style-type: none"> ▪ System quality ▪ Information quality ▪ Service quality ▪ Technological/infrastructural issues, ▪ Users' IT self-efficacy 	Ajoye (2014)
Exploring students' satisfaction with universities' portals in developing countries A cultural perspective	<ul style="list-style-type: none"> ▪ Educational services availability ▪ System quality ▪ Information quality ▪ Service availability 	Abdel, Hamza, & Abuhamad (2015)

Appendix F: Visited Web Portals

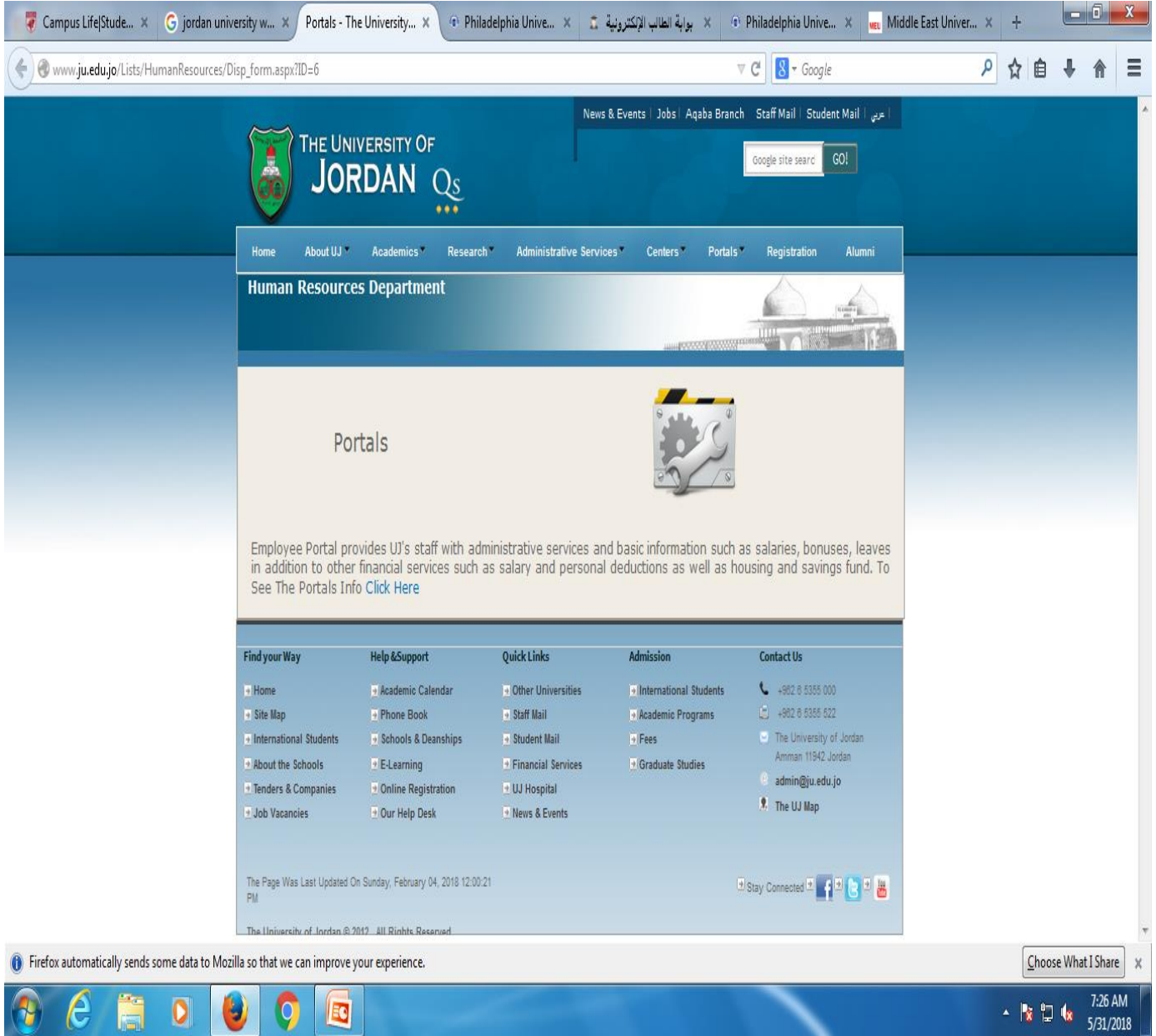


Figure 5 University of Jordan employee Web portal



Figure 6 Philadelphia university web portals