

E-LEARNING MANAGEMENT SYSTEM FOR SIMAD UNIVERSITY IN SOMALIA

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E-LEARNING MANAGEMENT SYSTEM FOR SIMAD UNIVERSITY IN SOMALIA

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Arts and Science partial fulfillment of the requirement for the degree Master of Science**

(Information Technology)

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By

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ABSTRACT

With the advancement of Information and Communication Technology in this era, teachers should take the advantage to improve their teaching techniques. Students should be allowed to learn at anytime, anywhere and at their own pace. Teachers also be able to keep a collection of test/tutorial questions online. Furthermore, the motivation for this study is to improve the learning environment in SIMAD University through the use of Internet technology. Therefore, based on the above ideas, a prototype of E-learning Management System has been developed. In addition, this software is a web based application system that can be accessed by students as well as lecturers through the Internet technology by anywhere and anytime. The methodology adopted in this study is the design research Methodology by Vaishnavi and Kuechler (2004).

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LIST OF ABBREVIATIONS

CSF (Critical success Factors)

EMS (E-learning Management System)

LMS (Learning Management System)

PHP (Hypertext Preprocessor)

UML (Unified Modeling Language)

SIMAD (Somalia Institute of Management and Administration Development)

Chapter One

Introduction

1.0 Background of the study

Information and Communication technology has created a need to transform how University students learn by using more modern, efficient, and effective alternative such as E-learning or E-learning. According to Global Industry Analysts (2008), E-learning has emerged as an imperative tool to communicate knowledge in the academic as well as corporate sectors. Since E-learning has several compensation in terms of cost reduction, simplified training programs, flexibility and convenience; it is balanced to become an integral component of information dissemination and emerges as the new paradigm of modern education. Backed by several favorable trends, the world of E-learning market is projected to exceed US\$52.6 billion by 2010 (Global Industry Analysts, 2008). It is believed that the role of E-learning and information and Communication technology in education will continue to expand in scope and complexity of the education.

According by Ron Kurtus (revised 4 April 2004) E-learning is a catch-all term that covers a wide range of instructional material that can be delivered on a CD-ROM or DVD, over a local area network (LAN), or on the Internet. It includes computer-based training (CBT), web-based training (WBT), and electronic performance support systems (EPSS), distance or online learning and online tutorials. The major advantage of E-learning to students is to access easily anytime anywhere. There are some typical elements and a standard approach of developing or authoring E-learning material. E-learning System is apart Learning Management System that is developed to apply SIMAD University Mogadishu-Somalia.

One of the main features of informative and knowledge society in the advancement of information technology is E-learning. It means that by using computer, a student can follow a lecture with the help of audio and video aids, browse through reading materials available in the library. Students can answer exercises with regard to the topics, evaluate his performance, and interact with other students or lecturer, taught in the lecture and others – all done virtually without leaving his bedroom!

The idea of establishing the Somali Institute of Management and Administration Development (SIMAD) University was put forward by a group of intellectuals and former university lecturers. After two years of feasibility study in the dynamics of the local emerging markets, their current and future capacities, SIMAD was established and became operational in November 1999. The institute is a non-profit entity with no political and / or clan affiliation. The vision of the institute is to equip the present and the future professionals of Somalia with quality and modern managerial, administrative and technological skills in selected areas or disciplines. This is done through training middle level managers for both public and private sector enterprises. However, since the emerging private sector was more in number and has high capacity of absorbing the graduates than the public sector, SIMAD programs were mainly inclined to the education and training that were more relevant to the private sector than the public.

From a humble beginning of 4 small rooms in a rented house situated in Hodan district, Mogadishu 1999, the University has now become the most important learning centre in Mogadishu-Somalia with its purposely built premises located along the industrial road in Mogadishu-Somalia.

However, this software is developed only for SIMAD University Somalia usage in order to facilitate effective and efficient learning process, since throughout Somalian Educational sector no single E-learning management systems. Therefore, applying this software should encourage Somalia government and other non-governmental institution. If E-learning management system is implemented in SIMAD University, then the University becomes the first institution to introduce the system and put in practice in Somalia.

1.1 Problem Statement

Since SIMAD University started operation in the late 1999 up to date uses traditional face to face teaching contact. Lecturers do not have virtual place to upload materials or announcements to the students such as notes, PowerPoint slides, videos clips, and assignments. At same time, students cannot get those required information which is related to their educational field within the convenient time. Furthermore, the main challenge is that when lecturers and students communicate to each other it causes cost and time constrains. Moreover, if the lecturer wants to inform students on certain issue regarding lectures or other information he/she uses e-mail or telephone which of course is time consuming. Using E-learning, the University can force the complexity and assortment of LMS and also can achieve overall product quality within specific time and budget limits.

According to Zhargetal, et al. (2004) the traditional classrooms had three main problems, which include (1) lecturer-centered, (2) time location and (3) more expensive to deliver. It may not effective and efficient to students and lectures. This is due to sometimes students may want to ask questions about the materials and get the answer immediately or vice versa.

There are some reasonable excuses for this interesting fact in traditional face to face contact; learning is highly lecturer-centered. Even though many lecturers encourage students to ask

questions during the session, for a various reasons, many students do not question or ask for repetitions in the class or even when they have difficulty understanding the lectures and also do not have opportunity to review the lecture contents selectively.

Times and location are constraints unless using E-learning to increase the quality of education as well as to improves the learning environment. The current learning system in SIMAD University is manual because of lecturer-centered and there is no any technology system in the learning yet the university has facility such VSAT technology that can manage any implement E-learning application or/ and any other web based applications.

Thus, to overcome these challenges faces SIMAD University in order to improve the learning environment, the author of this study as well as a former of SIMAD lecturer, who is looking for a better alternative way to improve the learning environment, and proposed to develop web based E-learning Management System.

1.2 Research Questions

Based on the problem statement mentioned above, the following questions are constructed:

1. What are the user requirements for developing E-learning Management System for SIMAD University?
2. What are the relevant materials to be stored and managed by the system?
3. How to develop a prototype model for E-learning system for SIMAD?

1.3 Research Objectives

The main objective of this study is to develop an E-learning Management System in order to improve the quality of learning process. The sub objectives of the study are the following:

1. To identify User requirements for SIMAD E-learning management system.
2. To design and develop a prototype model for E-learning Management System for SIMAD University.
3. To evaluate the functionality of the prototype.

1.4 Scope of the study

This study only focuses on the functionalities of E-learning Management System for SIMAD University. Moreover, the main elements that the study will produce are downloading materials, upload documents, login and view the reports functions. In order to view or download or upload materials, students and lecturers have to login the system for valid username and password. In addition, the requirement model of this project will be consisted of UML diagrams such as class diagrams, use case diagram, activity diagrams and collaboration diagrams. Beside, E-learning system will use to develop a prototype PHP web development and MySQL database. Finally, the study will produce list of requirements that supports to design and develop the new system.

1.5 Deliverable

The expected output of this study is E-learning Management System (Web based) for SIMAD and prototype of the system. The aims of the system is deal with users as Web based learning Center whereby the lecturers upload their materials such as documents (Microsoft PowerPoint presentation ,Microsoft word, Adobe PDF, video clips), Homework, Announcement, discussions and comments to the students. On the other hand, students also

can download those materials that uploaded by their lecturers as well as sending the required questions in order to get response immediately. Furthermore, the system have two users mainly lecturers and students. However, the lecturers will be presented by system administrator while, the students must be able to view, download, write comments or questions. Overall, the system administrator will manage the system functionality in order to facilitate students and lecturers to login by using separate user name and password as well as creating new subject, semesters, classes and adding new student and lecturers.

1.6 Report Structure

The entirely study of E-learning Management System for SIMAD University consists of six chapters that displayed as follows:

Chapter one: Introduction

The chapter gives brief to the study such a background, problem statement, research questions of the study. The objectives, scope, significant and deliverable are also elaborated.

Chapter two: Literature Review

In this chapter concentrate on the literature of E-learning Management System will be provided. Moreover, previous works in building and applying such systems, benefits, types of E-learning System will be discussed and collected.

Chapter three: Methodology

This chapter explains the details of the selected methodology applied in performing this study within the aim of accomplishing the study of the objectives.

Chapter four: Analysis and design

This chapter covers the analysis and design of the system by using UML within Relational Rose 2000 software. Furthermore, it will perform the non-requirements and functional requirements of the system such as use case diagram, use case specification, sequence diagram, activity diagram and class diagram drawn.

Chapter five: **Discussion of the result**

This chapter discusses the result gathered from respondents.

Chapter six: **Conclusion and Recommendation**

This chapter emphasizes the study future work and recommendations to improve the future work.

1.7 Gantt Chart/ Timeline

Tasks	Months											
	March			April		May				June		
Analyze(Requirement analysis, Proposal)	█	█	█	█	█							
Design (Database Design and Interface Design)		█	█	█	█	█	█	█	█	█	█	█
Coding & Testing		█	█	█	█	█	█	█	█	█	█	█
Implementation (Evaluation, Project report and Presentation)					█	█	█	█	█	█	█	█

Table 1.1: The Gantt chart for the proposed system.

1.8 Summary

This chapter brings you the overview of the study to design a prototype for E-learning Management System based SIMAD University Mogadishu- Somalia. Although the requirement is focuses only on the Students and Lecturers in SIMAD but the similarities of this study can be guidelines and references for those who's developing a similar E-learning System other institution in Somalia.

Chapter Two

Literature Review

2.0 Introduction

The background of this study and brief description were introduced in the previous chapter. This chapter will continue on the discussion and idea about in previous work related to this study.

2.1 Learning Management System (LMS)

A Learning Management System (LMS) is aimed at managing an E-learning environment, establishing the organization and delivery of content, administrating resources and tracking learning activities and results (Collier, 1996; Oleg & Liber, 1999). LMS that are in use today are either commercial products (e.g. Web-CT, Blackboard, Top-Class), or free open source products (e.g. ILIAS, Manhattan Virtual Classroom), or customized software systems that serve the instructional purposes of particular organizations. LMS that belong to the third category are exponentially increasing, as most education and training institutions are building or planning to build their own LMS. This is due to the fact that a customized LMS will fit better their specific educational/learning purposes, and proves to give a good return of investment over the years. However, the design and implementation of such systems is not an easy task, since they are complex systems that incorporate a variety of organizational, administrative, instructional and technological components (Moore and Kearsley, 1996; Carlson, 1998). Therefore systematic, disciplined approaches must be devised in order to leverage the complexity and assortment of LMS and achieve overall product quality within specific time and budget limits. One such approach is the use of design patterns, so that these systems will not be designed and implemented from scratch, but based on reusable design experience gained over several years of try-and-error attempts. The need for design patterns

and pattern languages in the domain of Learning Management Systems is gradually being accepted by the LMS community and in general, patterns are emerging for various aspects of E-learning.

2.1.1 The context of LMS

Learning Management Systems have been widely adopted by institutions and instructional designers in order to fulfill certain needs and requirements in a field of ever increasing demands for effective, fast and pedagogically correct education and training. The users of LMS can be classified into three categories:

- The learners that use the system in order to participate through distance (in place and/or time) to the educational process. In fact, the learners are the focal users of LMS, in the sense that these systems are being developed in order to satisfy some of their needs and resolve their problems.
- The instructors, being the teachers and their assistants that use the system in order to coach, supervise, assist and evaluate the learners (e.g. notify for important issues on an electronic notice board, engage in discussions in electronic form, communicate and exchange personal messages with learners, collect, assess and return deliverables, etc.).
- The administrators of the system, who undertake the support of all the other users of the system and safeguard its proper operational status

According to (McCormack and Jones, 1997), an LMS offers services for satisfying specific instructional needs and/or automating (partially or fully) instructional events. LMS should support the development and execution of four basic tasks via a simple, friendly and uniform user-interface:

- Information distribution, e.g. announcing the tips of the day, calendar, glossary, etc.

- Management of learning material, e.g. customization of the user interface to the needs of the instructor, updating the learning material, etc.
- Offer of multiple communication facilities, e.g. asynchronous and synchronous communication.
- Class management, e.g. on-line marking of learners' assessments, tracking learners' participation, management of learners' profiles, etc.

2.1.2 Quality in online teaching and learning

Developing resources to support quality teaching and learning was a key objective of the National Flexible Toolbox Project. Where as many online resources are often criticized as electronic replicas of existing print-based resources (eg. Mioduser et. al., 1999), the Toolbox project established some sound principles and processes to support the development of high quality learning settings. It sought to achieve this by promoting design and development processes based on socio-constructivist learning theories and learning through knowledge construction. Such approaches require distinctly different design and development processes to those suggested by the instructional systems design (ISD) approaches which most developers had previously been following.

ISD approaches suggest an instructional and learning sequence which designers can follow in the determination of their learning settings. One such approach is described by Gagne (1972) in which instruction is seen to follow an instructional sequence of 9 events of instruction involving four stages: introduction, the body of the instruction, assessment and conclusion. Designers following such guidelines tend to focus their online learning settings around design strategies that place lesson content and resources at the forefront of instruction. The learning materials are presented as content to be learned and knowledge to be acquired and learners are provided with these resources and various consolidating activities. Such approaches tend

to result in learning settings with poorly developed learning designs. Often there is no particular learning strategy presented to engage and contextualize the material. The content is presented in pages which learners are expected to follow and learning is intended to follow. Most contemporary writers now support learning settings with more deliberate forms of learning design. This transmission approach to teaching is also often evident in settings where discipline-based approaches are employed that replicate traditional teaching and lecturing practices.

The learning designs which Toolbox developers were encouraged to use were those where learning is based on the students' completion of tasks and activities supported by appropriate learning resources and learning supports (Figure 2.1). Learning tasks play a fundamental role in determining learning outcomes. They determine how the learners will engage with the course materials and the forms of knowledge construction that will take place (eg. Wild and Quinn, 1997). They need to support cooperative and collaborative activities among the learners and must provide opportunities for reflection and articulation. The activities provide the purpose and the context for learners to deal with the content and information (Duffy and Cunningham, 1996).

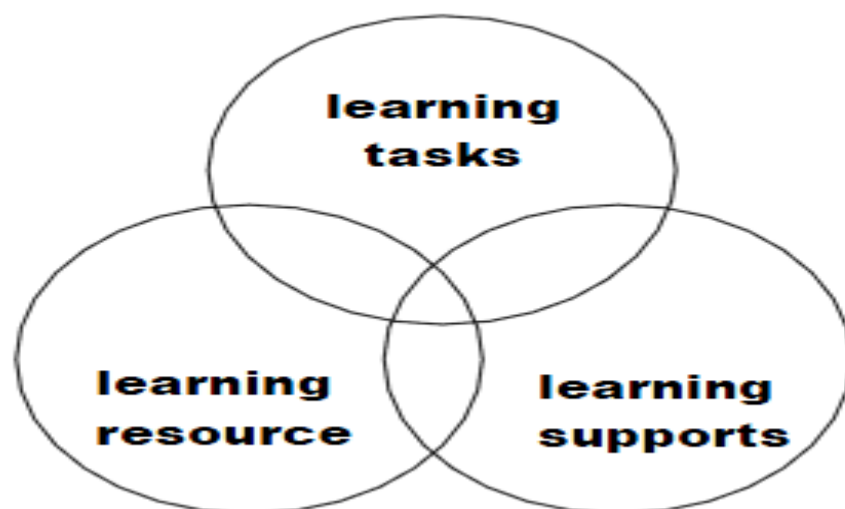


Figure 2.1: Framework describing critical elements of online learning settings (Oliver, 1999)

2.2 E-learning

E-learning is one of the new learning trends that challenge the traditional “bucket theory” or the ‘banking concept’ of education (Freire, 1994). “E-learning or electronic learning can be defined as instructional content or learning techniques delivered or facilitated by electronic technology” (Guha & Maji 2008). E-learning also can be viewed as the delivery of course content via electronic media, such as the Internet, intranets, extranets, satellite broadcast, audio/video tape, interactive TV and CD-ROM (Urdan & Weggen, 2000).

In the background of E-learning it is important to note that there is no single evolutionary tree, and no single agreed-upon definition of E-learning. Since the 1960s, E-learning has evolved in different ways in Business, Education, the Training sector, and the Military, and currently means quite different things in different sectors. In the school sector, ‘E-Learning’ refers to the use of both software-based and online learning, whereas in Business, Higher-Education, and the Military and Training sectors, it refers solely to a range of on-line practices (Nicholson, 2007).

E-learning has been viewed as synonymous with web-based learning (WBL), Internet-based training (IBT), advanced distributed learning (ADL), web-based instruction (WBI), online learning (OL) and open/flexible learning (OFL) (Khan, 2001). It has the potential to revolutionize the basic tenets of learning by making learning individual-based rather than institution-based. E-learning is training that capitalizes upon the wide variety of new training technologies such as web-based training and CD-ROM. Although any form of E-learning may be useful for geographically-dispersed training audiences, E-learning can also take place on-site, in a self-paced fashion.

Online learning is an educational concept that implies using local, extended networks, or the Internet to spread information, to communicate, and to support any other kind of educational interaction between students and teachers. Many other terms, such as E-learning, virtual learning, distance learning, tele E-learning are also used when discussing education (teaching and learning) with the aid of a computer (CAL, standing for Computer Assisted Learning). Although not strictly synonymous, all these terms address the issues of Web-based learning or the use of NICTs (New Information and Communication Technologies), and share the aim of improving flexibility in location and time management for learners. Meanwhile, the blended learning concept also became attractive: the mix of E-learning and classic learning styles (EF-ODL, 2008). The concept of blended learning implies a mixture of traditional teaching and online education (Hadengue, 2004).

Elementary and secondary schools, as well as universities, have capitalized upon new technologies in order to provide courses and sometimes entire degrees to students that are geographically dispersed. To distinguish these college and university efforts from those being undertaken in industry, we refer to this type of coursework as distance education because E-learning requires investment of time and effort in developing new skills, new approaches, and new resources perhaps time and effort that would otherwise be spent on research (Kenet, 2004).

The University of Phoenix Online, Worcester Polytechnic Institute and Colorado State University is examples of degree-granting, distance learning institutions (Peterson's Distance Learning, 2002). Other schools offer numerous courses via distance education (Chute et al., 1999). In fact, as of 1997, it was reported that there were over 150 accredited colleges and universities with degree programs that allow students to spend little or no time physically on college campuses. Popular topics include technology-based courses and business

management courses (Herther, 1997). Incidentally, much of the research on the effectiveness of E-learning has taken place in educational settings.

2.2.1 **Types of E-learning**

According by (Kumaran & Nair 2010), E-learning falls into four categories, from the very basic to the very advanced. The categories are:

2.2.1.1 **Knowledge databases**

While not necessarily seen as actual training, these databases are the most basic form of E-learning. Knowledge databases are available at software sites offering indexed explanations and guidance for software questions, along with step-by-step instructions for performing specific tasks. These are usually moderately interactive, meaning that you can either type in a key word or phrase to search the database, or make a selection from an alphabetical list.

2.2.1.2 **On-line Support**

On-line support is also a form of E-learning and functions in a similar manner to knowledge databases. Online support comes in the form of forums, chat rooms, online bulletin boards, e-mail, or lives instant messaging support. Slightly more interactive than knowledge databases, on-line support offers the opportunity for more specific questions and answers, as well as more immediate answers.

2.2.1.3 **Asynchronous training**

This is E-learning in the more traditional sense of the word. It involves self-paced learning, CD-ROM-based, Network-based, Intranet-based or Internet-based. It may include access to instructors through on-line bulletin boards, on-line discussion groups and e-mail. Or, it may be totally self-contained with links to reference materials in place of a live instructor.

2.2.1.4 Synchronous training

Synchronous training is done in real-time with a live instructor facilitating the training. Everyone logs in at a set time and can communicate directly with the instructor and with each other. It lasts for a set amount of time - from a single session to several weeks, months or even years. This type of training usually takes place via Internet Web sites, audio- or video-conferencing, Internet telephony, or even two-way live broadcasts to students in a classroom.

2.2.2 E-learning perspectives

E-learning has a truly vast perspective. It is a collaborative learning process where people learn from one another. The learner is connected to professionals and experts both in and outside the organization. He can select activities from a personal learning menu. In E-learning the instructional material and content may be delivered by any or all electronic media including the Internet, Intranet, extranet, LAN, Satellite broadcasts, audio/video tapes, CD-ROM and interactive TV. It includes computer-based training (CBT), electronic performance support systems (EPSS) and web-based training (WBT), in addition to distance learning (Guha & Maji 2008).

Up-front planning is one of the most important elements of E-learning. The user interface has to be intuitive and easy to navigate. Fancy or obscure techniques are better to be avoided, as these tend to discourage the learner.

Figure 2.2 explains the various components of E-learning. In short, there will be teaching ends and learning ends technologically and synchronously.

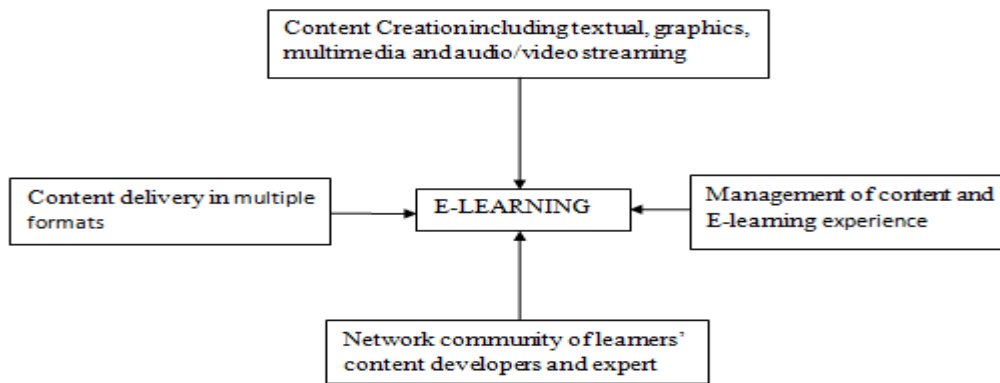


Figure 2.2: E-learning Component, Import from (Guha & Maji, 2008)

2.2.3 Potential Benefits and Limitations of E-learning

A good number of experimental or pilot programs have helped us evaluate the advantages and disadvantages of E-learning in general. E-learning strategies seem to offer a larger amount of information than traditional courses as well as easier access to that information. In addition, both controlled information sources (that is, provided narrowly by the teacher's textbook) and open information sources are available in parallel. This may stimulate critical review and comparison on the part of the learner and enrich the pedagogic process. In fact, the main difference between classical learning and computer-assisted learning courses probably does not lie in their raw contents, but rather in information processing and the channels used to pass such information on. Learning may be further stimulated by interactive and retroactive processes, the visual approach to communication and the enhanced ability on the part of the learner to manipulate information for themselves (Tuovinen, 2000).

However, E-learning has also been the object of a number of concerns. It is obvious that it requires more technical equipment than traditional courses, though this has become less of a problem since most students now have access to computers and to the Internet. More

importantly, a minimal computer literacy rate is usually required before an E-learning course may become effective.

Computer literacy, or “the ability to use applications rather than to program” (Hadengue, 2004), as well as reading and writing abilities, may be of greater importance for an isolated e-learner than for a traditional learner within a classroom. One key concern is certainly how to generate and assess student motivation. If not addressed, usually by tutoring, the motivation of the least autonomous and/or the weakest students may become a significant problem. Thus, in most cases a tutor should help the students with the start-up process and somehow be committed to follow-up. Because it is at variance with preconceived ideas, and at least in the initial steps of most practical courses, E-learning may indeed be as time-consuming as a traditional course. Here is the greatest challenge to E-learning: while providing unmatched flexibility, with its independence of physical location, permanent access, infinite adaptability, and its endless availability for individual follow-up by the student, E-learning cannot provide a substitute for or even adjust to the failing autonomy and/or learning drive of the student. Therefore, one drawback of E-learning may be that student motivation is a prerequisite – there is no potential benefit from the immediate help of group dynamics or face-to-face interaction with a teacher.

As already alluded to, recognition of skills through the various awarding of degrees, credits or training certificates, which represent strong incentives to students, are seldom offered by universities to E-learning students in information literacy. Indeed, even when valued by students, most such E-learning training courses remain unrecognized within the university curriculum. If lack of recognition does contribute to the sidelining of E-learning, it however remains a factor that can (and should) be effectively addressed by university boards of study.

Finally, it may be noted that ideas developed for commercial marketing have probably skewed the approach of a number of universities to E-learning strategies. Commercial “client-oriented approaches” stress the importance of creating proximity and direct relationships with potential buyers. Obviously, this does not easily transpose to university libraries. Nonetheless, it has sometimes been taken as a weak point of E-learning that it neither relies on nor stimulates direct person-to-person interaction. Again, this can be seen as another reason for stressing the importance of some degree of ancillary tutoring in support of e-teaching.

2.2.4 **E-learning and E-training**

E-learning is transitional method which supports a large amount of the instruction can be effectively by online venue to communicate any instructional information, simulate processes, demonstrate proper task performance, train on custom software or equipment, show how to troubleshoot system or preparer the learning for classroom training. Also e-learning reduces the time and cost to get the knowledge (E-learning information advantages, 2009).

E-learning is material can be in the PDF format for easy download the ways subscription via chat rooms, emails and the discussion forums(Omnexus, 2009); (E-learning advantages and disadvantages, 2009).

According to this Figure 2.3, that present the rapid progress of the communication tools in the many field, e-training can monitor the handling of new technologies, also e-training can support the personal needs from the material to and other content in order to prove basic and strategic for the processes of e-training (Barb, 2007). The most tools that aspect like E-mail,

chats and forum. The presented model showed the relationship with the proposed E-learning system through support the learner needs from any material of the university.

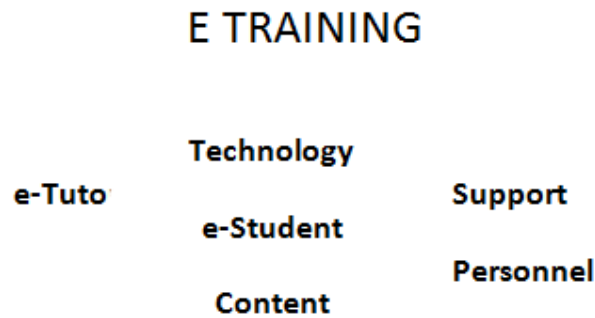


Figure 2.3 E-training Facilities by (Barb, 2007).

2.2.4.1 Interactive tools in the Learning and Training

The suitable technology and the media tools provide the easy way to realize a web-based animation such as Java-applet which can be executed platform-independently within Web browsers all over the world (Ann, 2005). The general architecture of such animation applet is shown in Figure 2.4. Core of the animation applet is an animation engine which has the test to compute state transitional of the animated dynamic system. Principally, there exist two realization alternatives for an animation engine.

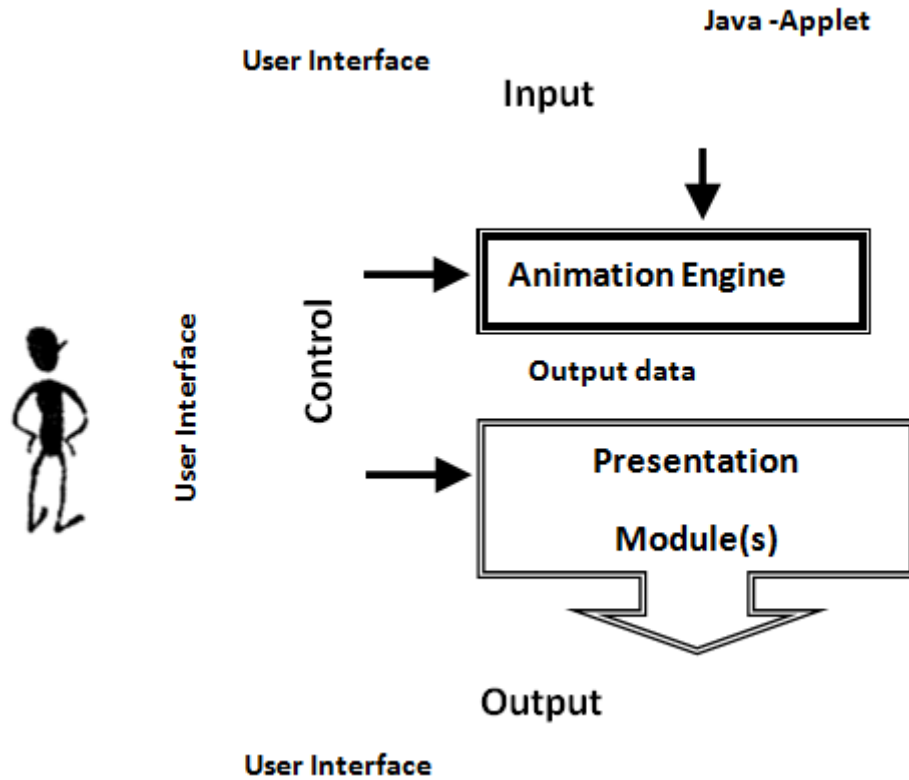


Figure 2.4: General Architecture of an Interactive Web-Based Animation (Syrjokow, 2000)

2.2.5 E-learning Critical Success Factors

The purpose of E-learning, like any other learning approach, is to achieve the learning objectives. The objective attainment measures can be environmental, Technological, student-related, and instructor-related.

In E-learning some of the crucial CSFs are technological, such as bandwidth, hardware reliability and network security and accessibility. Another E-learning CSF is student engagement in learning models. E-learning models are synchronous (real-time), asynchronous (anytime and anywhere), or a mix of the two. There are numerous tools that instructors can use to adopt an E-learning model; mini-lectures, electronic/conventional discussion, active/cooperative learning and many others. The third E-learning CSF is student-related.

Students must be motivated and committed. In E-learning based courses, students take the responsibility for their learning pace.

In an exploratory investigation of learner perceptions according to (Selim, 2007), E-learning can be integrated into many university programs. There are several factors that need to be considered to identify and measure E-learning applications' critical success factors (CSFs), from learner perceptions.

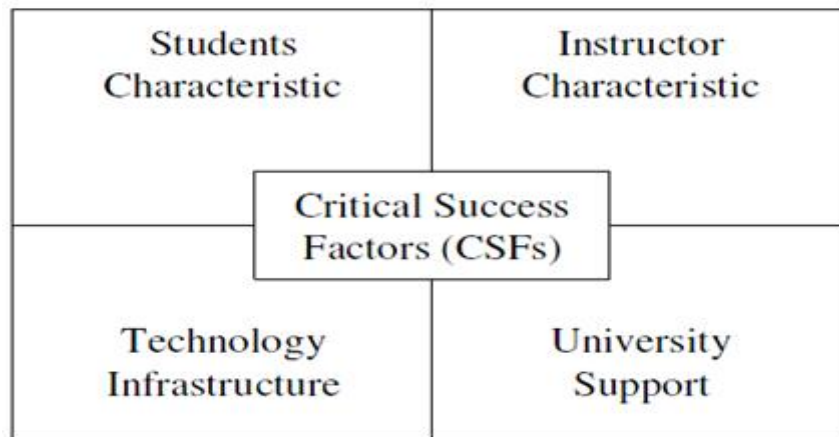


Figure 2.5 E-learning CSFs: An exploratory investigation of learner perceptions (Source: Selim, 2007)

2.2.5.1 E-learning CSFs categories

E-learning CSFs within a university environment can be grouped into four categories (Selim, 2007):

- Instructor;
- Student;
- Information technology;
- University support

As for all educational endeavors, the instructor plays a central role in the effectiveness and success of E-learning based courses. Collis (1995) and Willis (1994) believed that it is not the information technology but the instructional implementation of the IT that determines the

effectiveness of E-learning. Webster and Hackley (1997) proposed three instructor characteristics that affect E-learning success:

- IT competency;
- Teaching style; and
- Attitude and mindset.

Volery and Lord (2000) suggested that instructors provide various forms of office hours and contact methods with students. Instructors should adopt interactive teaching styles, and encourage student–student interaction. It is so important that instructors have good control over IT and are capable of performing basic troubleshooting tasks.

University students are becoming more diverse and demand for E-learning based courses is increasing (Papp, 2000; Volery & Lord, 2000). Students need to have time management, discipline, and computer skills in order to be successful in the E-learning era. Student’s prior IT experience, such as having a computer at home and attitudes towards E-learning, is critical to E-learning success.

As stated before, research concludes that E-learning based courses compare favorably with traditional learning and E-learning students perform as well or better than traditional learning students (Beyth-Marom, Chajut, Roccas, & Sagiv, 2003). This shows that students like to use E-learning if it facilitates their learning and allows them to learn anytime, anywhere in their own way (Papp, 2000). The information technology (IT) explosion resulted in changes in education. E-learning integration into university courses is a component of the IT explosion; as a matter of fact IT is the engine that drives the E-learning revolution. The efficient and effective use of IT in delivering E-learning based components of a course is of critical

importance to the success and student acceptance of E-learning. So ensuring that the university IT infrastructure is rich, reliable and capable of providing the courses with the necessary tools to make the delivery process as smooth as possible is critical to the success of E-learning. IT tools include network bandwidth, network security, network accessibility, audio and video plug-ins, courseware authoring applications, Internet availability, instructional multimedia services, videoconferencing, course management systems, and user interfaces. E-learning projects that were not successful in achieving their goals did not have access to technical advice and support (Aldexander, McKemzie, & Geissinger, 1998; Soong, Chan, Chua, & Loh, 2001). If the technical support is lacking, the E-learning will not succeed. University administration support to E-learning is essential for its success. This study limited the E-learning CSF categories to those that were reported in the literature, while including newly-used items within each CSF category.

2.3 Web-Based Learning Environment

As an increasingly powerful, interactive, and dynamic medium for delivering information, the World Wide Web (Web) in combination with information technology (e.g., LAN, WAN, Internet, etc.), has found many applications. One popular application has been for educational use, such as Web-based, distance, distributed or online learning. The use of the Web as an educational tool has provided learners and educators with a wider range of new and interesting learning experiences and teaching environments, not possible in traditional in class education (Khan, 1997). Web-based learning environments have been developed mainly by instructional designers using traditional instructional design models such as the instructional systems design (Dick & Carey, 1996), cognitive flexibility theory (Spiro, Feltovich, Jacobson, & Coulson, 1991), and constructivist learning environment (Jonassen, 1999).

However, many of these approaches still lack two important considerations needed for implementing learning applications based on the Web: (1) integration of the user interface design with instructional design, and (2) development of the evaluation framework to improve the overall quality of Web-based learning environments.

First, little attention has been paid to design issues of the human-computer interface, which are critical factors to the success of Web-based instruction (Henke, 1997 & Plass, 1998). Learners must be able to easily focus on learning materials without having to make an effort to Figure out how to access them (Lohr, 2000). However, current instructional design principles and models do not explicitly address usability issues of the human-computer interface. Second, the rapid growth of Web-based learning applications has generated a need for methods to systematically collect continuous feedback from users to improve learning environments. Unfortunately, few attempts have been made to develop such formative evaluation frameworks for Web-based learning environments whose foci are both the instructional system and user interface system. In addition, few approaches take user interface design issues into account in their evaluation processes. A number of evaluation frameworks that can be used to evaluate the user interfaces have been proposed (eg., Nielsen, 1993 & Rubin, 1994). But, these models are intended for software environments rather than for Web-based learning environments in which user interface systems should be developed to support users' learning activities.

2.4 Web Applications Definition

Generally, a web application is a software application that delivers its functionality to a user from a Web server, through a network such as the World Wide Web or an intranet. The user views and manipulates the application through a Web browser (Knight and Dai, 2002). There are various web applications that adopted in different fields, such as; education, e-commerce, and other web-based facilities (Anderson, 2007; Atanas & Miriam, 2006). All these technologies it is not the real meaning for the Web-based that underpin the Internet and the Web:

- Blogs: this kind of web applications represents a magazine that is available on the web. Blogs are typically updated each day using software that allows people with little or no scientific background to update and maintain the blog (George & Scerri, 2007).
- Wikis: this kind of web applications represents a grouping of web pages calculated to enable any person who accesses it to contribute or change content, using a simplified markup language (George, & Scerri, 2007).
- Multimedia sharing services: this kind of web applications represents storage and sharing of multimedia content such as photographs (e.g. Flickr); video (e.g. YouTube) and podcasts (e.g. Odeo) (George, & Scerri, 2007).
- Content syndication: this kind of web applications represents the process whereby content from one website is collected within a feed which can then be read by other websites or reader programs (George & Scerri, 2007).
- Content tagging services: this kind of web applications represents the keywords to be added to a digital object such as a website or photo (George & Scerri, 2007).

2.4.1 **Web and Internet**

The World Wide Web is growing at exceptional rate. The current web is largely based on the files system technology which can deal well with the resource it is no longer to rely on this convention on the web (Carriere & Kazman, 2005).

The official description describes the World Wide Web as a “wide area hypermedia information retrieval aiming to give universal access to a large universe of documents”.

Using a popular software interface to the web called web browser, the web project has changed the way people view and create information it has created the first global hypermedia network (Hughes, 1993).

The Internet is a true” information Superhighway “. It is a collection of electronic documents linked together like a spider web. These documents are stored on computers called server. The web has evolved into a global electronic published medium and a medium for conducting electronic commerce. It is the universe of networks of network accessible information, the embodiment of human knowledge.

The web has a body of software and set of protocols and conventions. Through the use hypertext and multimedia techniques, the web is easy for anyone to roam, browser and contributed to.

2.5 **Basic Web Architecture**

The usefulness of using web services has growth due to the client’s needs for better services. Nowadays, different techniques have been deployed for presenting the individuals query (Kong & Liu, 2003). Most of these techniques focuses on interact with the search tool to set up a search task and explore the results based query, other individuals who use assistive technology to navigate the web (Jacobson, et al., 2004; Silva & Paton, 2004). Figure 2.6

presents the multi components communication via Internet which contain the following classification:

- User PC: - helps to send and receive all variety of audio and video, such as (Sound card, web cam, and microphone).
- User Communication Equipment: - helps to connect the Users' PC(s) to the (Local Loop) such as (Modem, phone line, lan card, Routers, and Firewalls).
- Local Loop Carrier: - helps clients to identify the location based on the ISP's Point of Presence such as (Cables, Satellite, power line, and Wireless).
- ISP's POP: - helps to justify connections from the user and authenticated the user accessing.
- User Services: - use by the User for access (DNS, EMAIL, etc).
- ISP Backbone: - interconnects the ISP's POPs, AND interconnects the ISP to other ISP's and online content.
- Online Content: - these are the host sites that the user interacts with.
- Origins of Online Content: - helps to provide an original source of information.

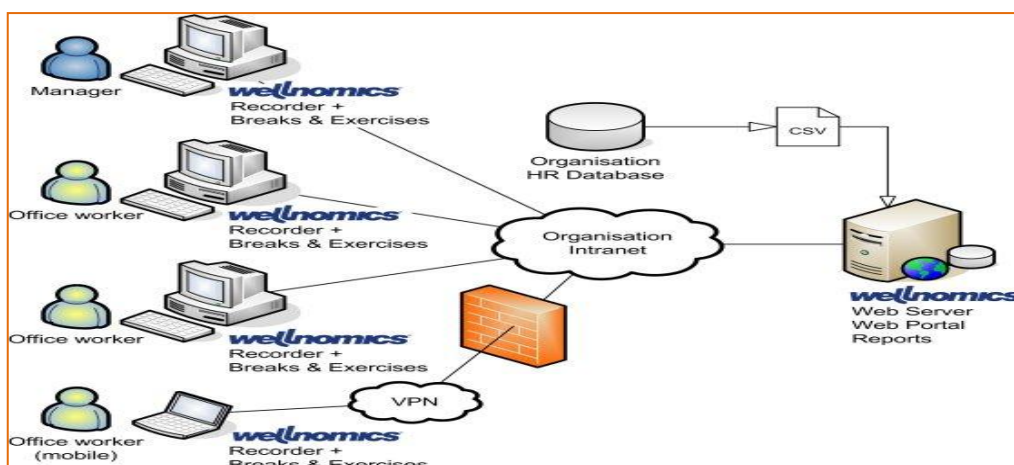


Figure 2.6: Basic Web Architecture (Richard, et al., 2006)

2.6 Web-Based Application

Web application known as an online communication services that client can access through their computer or handheld devices, this communication can be optimized via network support such as the Internet or an intranet. The using of web application has carry out the usefulness of employing technologies for describing query based synthesizer classifications in term of type, objects and contents (Chris, et al., 2008).

Concerning web pages, for understanding user query presents the new generation of screen readers interprets which designed based on structural HTML code to update and maintain web applications without distributing and installing software. Figure 2.7 shows the communication process among the web based applications.

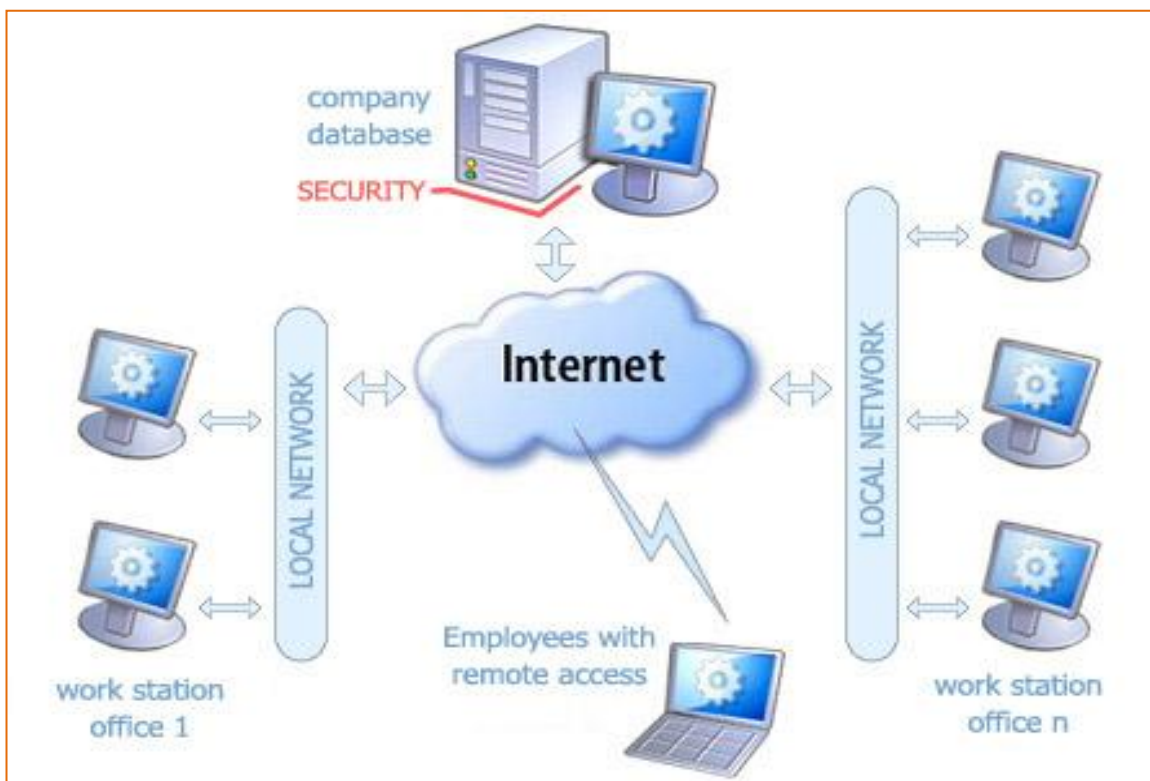


Figure 2.7: Web Base Applications (Chris, et al., 2008)

2.6.1 Advantage of Web-based Application

The progress in the business field these days became the real changing for the trade methods, the web-based occupy a big area in the growth. Otherwise the growth of the Internet makes it more flexible way for the business that can be available for the small business education and organization (Ventures Education System Corporation, 2008).

Some are referring to the new Internet evolution, which refers to organizations new approach to using the Internet to increase efficiency, productivity and customer satisfaction, while at the same time, substantially decreasing administrative and personnel costs. There are many other advantages for the web-based application:

- Web-based applications are custom designed to meet the specific need.
- Web-based application provides 24/7 access from any web-browser in the world to the data stored in the custom system.
- More administrator and support staff are very familiar with the use of the Internet. Web-based applications look like any other web-site and similarly, are very easy to use even the most computer-challenged administrator will quickly adapt themselves to a custom web-based solution.
- Web-based applications are compatible with all Microsoft office applications including Microsoft Word, Microsoft Excel, and Access.
- Web-based application are compatible with all popular web-browser including Internet Explorer, Netscape Navigator, Mozilla Firefox, Google Chrome and Opera(Ventures Education system Corporation).

2.7 Previous work

According to Wegner (2007) leading providers of e-content services and technology, today announced that it has launched a new live, online training programs hosted by ebrary's new Training Manager, the ebrary's is Set of e-stuff tools and resources which are licensed by publisher/content providers, e-content distribution, the goal of ebrary is to do what Libraries do not – provide access to information and current Partnership with Learning Network.

Participants, end-student and anyone interested in learning more about ebrary's services and training are welcome to attend by Stephne (2002,2004). He has developed a flaxible e-content platform, which participants may use in a number of different Mohammad (2006) integrated capacities: ebrary participants may purchase or subscribe to e-books and other contents under a vareity of pricing and access models Bailey (2006); Band (2006); Mike (2004) and they may license the ebrary platform to distributed, sell and market their own content online Quintm (2004).The functionality of the ebrary include the following :

- Provides content in a PDF-complaint format
- Includes full text and navigation featuris
- Copying and printing requires a fee (determined by publisher) per page
- Essentially a right management/ content distribution engine that delivered using a customizable interface and includes the ebrary reader with information tools software by Annuradha & Usha (2005), which enable integration with other resource to provide an economical and efficient way to utilize information Belanger (2007) and ebrary's global ebook survey (200).

According by Bolliger (2003); Mitchel (2002) that they illustrated the functionality of the online instructional invention which developed and evaluated through a field test. The module

was the prototype of a new learning and training system and part of the Florida Principal Certificate Myles (2000). The sample consisted of 25 trainees who teachers were appointed intern assistant principals or interim principals. The instructor was district-based and served as the subject matter expert. This module used to help those teachers, appointed interim assist principals to have their training via the developed prototype.

To guide the three phases of the module's production three instructional design modules were combined. The statistical analysis revealed the using of this module by the teachers, appointed intern assistant principals, or interim principals, which scored significantly higher on the posttest that presented the high agreement between those students. The instructor confirmed all trainees had met identified instructional objectives. Trainees evaluated the online training favorable, the majority of trainees agreed with all 49 items on an evaluation questionnaire administered after the field test Ruth (2004). Reported advantages outweighed experienced disadvantages, and participants indicated they would enroll in additional online training modules.

Participants offered several suggestions and recommendations for the revision of the modules by (Panagiotis, 2004); (Rabelani, 2004).

2.8 Summary

The analysis of literature review had broadened the scope of E-learning issues. The information and findings collected from this chapter is used as a guidance to develop the E-learning System. By Developing E-learning Management System for SIMAD University as a case study of this research, the study elaborates that E-learning system plays an important role in the educational institutions as well as improving the quality of the education. This chapter has also demonstrated the importance of E-learning system as well as disadvantage, potential

benefits and critical Success Factors of E-learning System in order to apply in SIMAD University. The next chapter will discuss the methodology we applied this study and also the tools that system to develop.

Chapter Three

Methodology

3.0 Introduction

The methodology that will be applied this study E-learning Management System for SIMAD University is titled the Design Research Methodology presented by (Vaishnava and Kuechler, 2004), and will be discussed in the following:

3.1 Research Methodology

According to Vaishnavi and Kuechler (2004), the design research methodology or sometimes called “Improvement Research” contained the following steps: Awareness the problem, suggestion, Development, Evaluation and Conclusion as showed in the Figure 3.1.

The five stages have their own results. In the awareness of the problem stage, a researcher will come out with the identification of the problem; scope of the study background information will be displayed. In the suggestion phase, creative ideas will appear to form the tentative design of the prototype. The third phase of this study is the development stage, where the ideas in the tentative design will be developed. The performance of the prototype will be measured in the evaluation stage, if the output or result is satisfactory, the conclusion will made to show the results. If there is any problem, the research can go back to the problem awareness, suggestion or development to the problem from its initial stage. Whenever, a problem appears in the development, evaluation or conclusion, the research will go back to the first phase to compete where the initial problem come up.

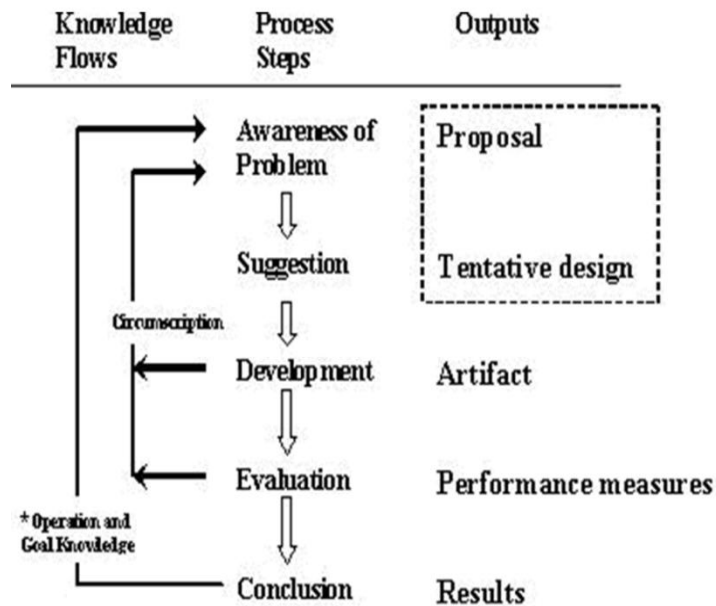


Figure 3.1: Design Research in information system (Vaishnavi & Kuechler, 2004).

3.1.1 Awareness of Problem

The problem needs to be well understood in this stage. The problem of traditional face to face contact was challenged since the SIMAD University operates in the late 1999 up to present. Moreover, lecturers face problem whenever they want to contact their students to bring assignment, lecture notes, or to make announcement, and discussions if needed. In addition to that, students also face the same problem in terms of getting lecture materials and also asking required question to get immediate response.

However, both lecturers and students uses SMS or email or telephone in order to contact each another to update the information related to their academic issues, that can be costly and time consuming.

The main objective of this study is to improve the learning environment and improve the interaction between lecturers and students. If SIMAD University implement and put in

practice this study E-learning Management System, the University will become the first institution that implemented E-learning in Somalia.

3.1.2 **Suggestion**

The study suggests developing E-learning Management System that deals with student and lecturers of SIMAD University to meet their requirements in order to improve the learning quality in SIMAD University. Moreover, to make system effective and efficiency, the study will discuss following requirements.

3.1.2.1 **Hardware requirement**

Since I propose to use E-learning as Online learning system or web based learning system in this study, the hardware requirement are as web application. First, PC server with multiple processors and extra hard disk for backup that will be stored all information about the student and lectures in the form of database. Secondly, the study suggested that each and every lecture and student must have one PC that has one or more web browsers (Internet Explorer and Mozilla Firefox and so on) that connected directly to the Internet. Finally, students and lecturers can access each other to the web application as usually.

3.1.2.2 **Software requirement**

The tentative design of the prototype came out in this phase. The page of the prototype will consists to display three part, Students, and lecturers and admin. So, the page used Photoshop to design in terms of pictures and color or design of each page. The language used to develop to build this prototype E-learning management System is that PHP web design programming as front end and MySQL as a database back end. Furthermore, to draw the relationships between elements, the study come up with Unified language Model (UML) such as Use Case

Diagram, Use Case Specification, Sequence Diagram, Collaboration Diagram and Class Diagram.

3.1.2.3 **User requirements**

Generally, the user of the proposed system is divided into three categories. That is, students, lecturers, and administrator. Each group of the system has its role based on its authority of using the system. Since the proposed system consists of three parts (Students, Lecturers), each group of the users can use the suitable part based on their authority. Students can use the user part of the system such to download materials, and view courses. In addition, they can see the latest courses materials added by their lecturers and download the files that are related to study. While the lecturers are second users, they are responsible to upload the materials to the students, in moreover; they manage their part in order to upload and viewing student reports. The last part is the administrator which is responsible to manage the overall functionality of the system such adding student and course name, updates students and lecturers information, moreover handling any problem of the system functionalities.

3.1.3 **Development**

A software development process is a process to build a software product or to enhance an existing one. Moreover, the Development stage of the research methodology is the most significant stage in our study since it represents the answer of the problem statement also it represents the main objective of this study (Hoffer, et al., 2002 & Liu, 2002). Generally, system development process consists of the three distinct phases that follow each other smoothly Analysis, Construction, and Testing. Each phase of development proceeds in strict

order, without any interfering or repetition steps. Thus, we are going to demonstrate each phase more later on.

3.1.3.1 **Analysis**

The purpose of the requirement capture analysis is to aim the development toward the right system. Its goal is to produce a document called requirement specification. Moreover, the requirement specification is the official statement of what is required of the system to be developed. It must state what to be done rather than how it is done. It must be in a form which can be taken as the starting point for the software development. A specification language is often used in this stage to translate the user requirements in a form that is beneficial to use in the next stage. Graphical notations such as Unified Modeling Language (UML) is often also used to describe the requirement specification which is a good approach to formalize of the system analysis and design in order to use it in the next stage which is the Construction stage (Lui, 2002).

3.1.3.2 **Construction**

Software design is realized as a set of programs or programs unit. Each module from the entire system is tested during this stage. The modules will be a combination, which makes up to the E-learning management system for SIMAD University. This phase will ensure that all modules, which will be developed for the E-learning management system, meet the system specifications. Primarily, this stage consists of design and implementation. The implementation part should be completed by adopting the web developing language which is PHP and for constructing the database we use MySQL to be as container to store the entire student's and lecturers' information and details. The representation of the E-learning system is the prototype which will be able to display what are the functions of the proposed system. The specific characteristic of the prototype is that it can play as the role of mediator of the

communication between the students and lecturers. It is much easier to express a view about something that can demonstrate and used (Ivar et al., 1993).

3.1.3.3 **Testing**

In this phase, each individual module that is developed for the E-learning management system will be tested as a complete system to ensure that the system meets the software requirement. Since we want to make our application more change proof on a more granular level, then we can build unit tests for our application. A unit test enables us to verify whether a particular method in the application works as we intend it to work. There are many benefits that result from writing unit tests for the code Building tests for the code provides a safety net for change. Moreover, it forces us to write loosely coupled code. When your application code is covered by unit tests, you can modify the code without the fear that the modifications will break the functionality of the code. Testable code tends to be loosely coupled code. To build your application so that it is testable, it needs to build the application in such a way that it has isolatable components. One class is loosely coupled to a second class when change the first class without changing the second class. Finally, writing unit tests forces to take a user's perspective on the code. When writing a unit test and take on the same perspective as a developer who will use the code in the future. Because writing tests forces to think about how a developer will use your code, the code tends to be better designed (Walther, 2010). As we are going to PHP version 5.2.8 in building the system, it enables us to build a unit test that help us to verify the code and see if it works as we intend it to work or not.

3.1.1 Evaluation

The evaluation of web has become more and more important in the development of web based applications (Conallen, 2000). Satisfactory outcome in evaluation phase will lead to conclusion, unsatisfactory outcome will lead to problem awareness, suggestion or development phase to find where is the initial problem.

The evaluation will perform to determine the level of effectiveness and efficiency of the functionality and operability of the system prototype after the prototype has been developed; it is test based on the list of requirement. The aim is to see the level of functionality and operability of the prototype system.

After development the functionality of the prototype model of the system will be tested or verified to meets all of the user requirements. To judgment and experience in interface, 30 questionnaires have been distributed to the participants among UUM students. The researcher will employ one technique to evaluate and test of the web based learning system for SIMAD, user testing students (questionnaire) to rate the user satisfaction.

3.1.2 Conclusion

The last phase of the general Design research methodology is the conclusion phase. In this phase, the results from previous phase of the study will implement the prototype of E-learning Management System for SIMAD University Mogadishu- Somalia.

3.1.3 Summary

This chapter discussed about the general research methodology that used in this study and how to apply E-learning Management System in SIMAD University based on design research methodology which conducts five phases as follows:

1. Awareness of the problem phase
2. Suggestion phase
3. Development phase
4. Evaluation phase
5. Conclusion phase

Chapter Four

System Analysis and Design

4.0 Introduction

This chapter describes the operation of system analysis and design. It includes explanations about the functional and nonfunctional requirements of the proposed E-learning Management System. Based on these requirements we are going to do some modeling based on The Unified Modeling Language (UML) which is probably the most widely known and used notation for object oriented analysis and design. Moreover, UML consists of various graphical notations, which capture the static system structures (class diagrams), system component behaviors (state transition diagrams) and system component interactions (collaboration and sequence diagrams) (Ali & Idris, 2007). In addition, this chapter will include the implementation of the proposed system and the main functionality of the prototype.

4.1 Requirement Gathering

Determining the requirements for an application is actually the steps of gathering relevant and important information (Bahrami, 1999), Bennett, 2002). In this study the interview is conducted to gathering the appropriate information on what the prototype should be able to do according to the needs of the prototype users. There are two techniques of gathering information that have been conducted such as interview and questionnaire (Dennis 2005). The list of questions that has been asked during the interview classified as follows:

- i. How does the current learning situation in SIMAD University?
- ii. What are the problems of the current Learning in terms of learning contents view?
- iii. How to improve the learning environment in SIMAD University?

- iv. What are the functionalities needed in order to implement the new E-learning management system?

4.2 **System requirements**

The achievement of application software depends on how well it fits the needs of its students, lecturers, staff and also its environment as a whole. Software requirements comprise these needs and requirements engineering (ER) is the process by which the requirements are determined (Dennis, Wixon, & Tegarden, 2005). Successful Requirement Engineering involves understanding the contexts in which the to-be-developed software will be used, modeling analyzing, negotiating (Bennett, Farmer, 2002); (Eriksson & Penker, 1998), and documenting the stakeholders' requirements, validating that the documented requirements match the negotiated requirements and managing requirements evolution (Betty & Cheng, 2007); (Bahrami, 1999). Requirements Engineering is concerned with identification of the goals to be achieved by the envisioned system, the operationalisation of such goals into services and constraints and the assignments of the responsibilities for the resulting requirements to agents such as humans, devices and software's. The processes involved in RE include domain analysis, elicitation, specification, assessment, negotiation and evolution (Hoffer, 1999). Getting high quality requirements is difficult and critical (Lamsweerde, 2004); (Hoffer, 2002).

List below are the functional requirements and non-functional requirements of the system. In the priority column, the following short hands are need:

- **M**- mandatory requirements(Something the system must do)
- **D**- Desirable requirements (Something the system preferably should do)
- **O**- optional requirements (something the system may do)

4.2.1 Functional Requirements

Functional requirement is what the system should. It may include calculation, data manipulation and processing or other specific functionality. It defines a function of a software system or its component (Conallen, 2000).

a) Functional Requirement

No.	Requirements ID	Requirement Description	Priority
	(EMS)_01	Login	
	(EMS)_01_01	Lecturers/Students can login to the system	M
	(EMS)_04	Lecture/ delete lesson	
	(EMS)_04_01	Lecturer can delete previous lesson	D
	(EMS)_05	Students/ view materials	
	(EMS)_05_01	Students can view material posted the lecturers	D
	(EDS)_06	Student/ download	
	(EDS)_06_01	Student can download uploaded documents such as (PowerPoint , PDF and Ms word)	D

	(EMS)_07	Add Student/Lecturer /Course	
	(EMS)_07_01	The administrator can add any student or lecturers to the system. Also he/she can register subjects.	M

Table 4.1: System operations and functional requirements

4.2.2 Non-Functional Requirements

Non-functional requirement states how a system behave, it specify the remaining requirements nit covered by the functional requirement.

b) Non-Functional requirement

No.	Requirement ID	Requirement Description	Priority
1	(EMS)_01	Reliability issue	D
	(EMS)_01_01	For a single student, the system should not crash more than once per 10 hours	
	(EMS)_01_02	After the system crash, the behave should perfectly normal when reload it again.	
2	(EMS)_02	Easy of access	M
	(EMS)_02_01	The system should be easy of accessible and easy of use.	
	(EMS)_02_02	Student and lecturer should be to access their account and also modify their profiles easily.	

3		Usability issues	O
	(EMS)_03	The system should give the student to send comments and questions with 3 seconds.	
	(EMS)_03_01	The system should give the student to download any materials posted by their lecturers.	
	(EMS)_03_02	The system should be able the lecturers to add materials and any information about the students.	

Table 4.2: Non-functional requirements

4.3 System design

The following sections illustrate the design of the proposed system E-learning Management System for SIMAD University.

4.3.1 Rational rose enterprise edition

In order to construct the design of the prototype, the developer uses rational rose enterprise edition software that allows drawing the necessity UML diagrams such as use case diagram, sequence diagram and class diagram that helps development stage.

4.4 UML (Unified Modeling Language)

UML is a widely applied standard for object-oriented modeling, using the meta-level notation of UML or extending the UML notation has been the dominant approach to aspect-oriented modeling (Xu, 2006). Aspect-Oriented modeling (AOM) for modeling access connection tools in web applications. Requires constructs for specifying base modules (Jacobson, 2004), crosscutting modules, and crosscutting relationships (Silva, P. & Paton, N., 2003). Most of

the existing work, however, lacks the ability to rigorously analyze the resultant artifacts (U.S House of Representative, 1999)

4.4.1 Use case Diagrams

A use case is a methodology used in system analysis to identify, clarify, and organize system requirements. The use case is made up of a set possible sequence of interactions between system and users in a particular, environment and related to a particular goal. It consists of a group of elements (for example, classes and interfaces) that can be used together in a way that will have an effect larger than the sum of the separate elements combined. The use case should contain all system activities that have significance to the users. A use case can be thought of as a collection of possible scenarios related to a particular goal, indeed, the use case and goal are sometimes considered to be synonymous (Canallen, 2000).

Use case description has gained a wide acceptance among the many techniques available for information system requirements specification. However, piecing up all the details required for the production of a high quality use case be a daunting tasks, specially for students and novice requirements professionals (Dias, 2008); (Atle, 2008). A use case diagram depicts actors, use cases, and relationships between them. The primary relationship between use cases are include, extend and generalization (Schmuller, 2002). Each use case implies a unit of useful functionality that the system provides to its actors

Main use case Diagram of the E-learning Management System

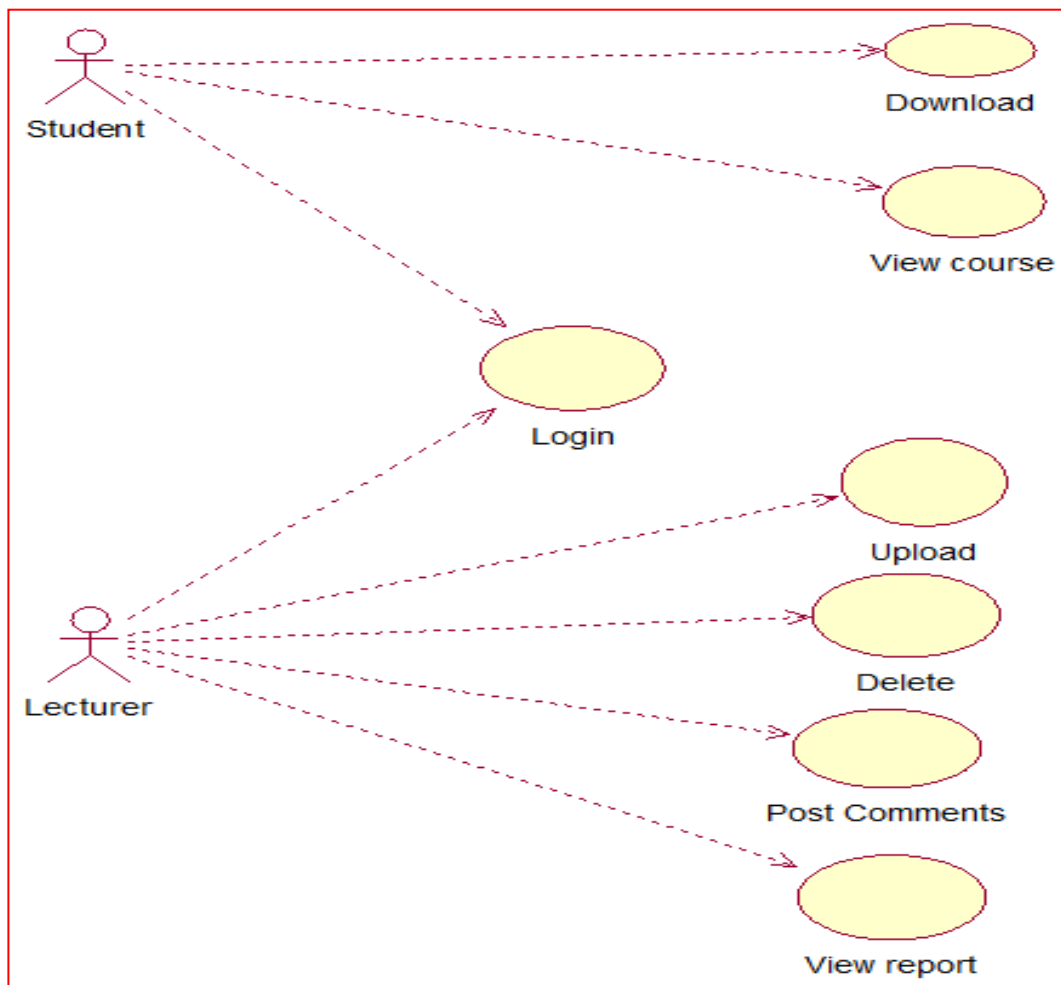


Figure 4.1: The main diagram Use Case for the system

The role of the student in this application is that such as downloading materials, viewing comments, searching course and posting request comments. On the other hand, the lecturer who is role is to function has to do the following functions such as upload the materials to the students, delete existing lectures, and write comments or announcements.

4.4.1.1 Use case identification

Use case identification for all the system (Lecturer, Student)

- 1) Lecturer

- a. Login
- b. Upload material
- c. Delete
- d. View report
- e. Logout

2) Student

- a. Login
- b. View materials
- c. Download documents
- d. Logout

4.4.1.2 Use case specification

The use case specification can support the reader by all the details of the use case operation in the system to make it easy to understand more clearly. This part presents the brief introduction, post condition, precondition and exception for each use case.

❖ Use case specification for login

- Use case specification for E-learning Management System

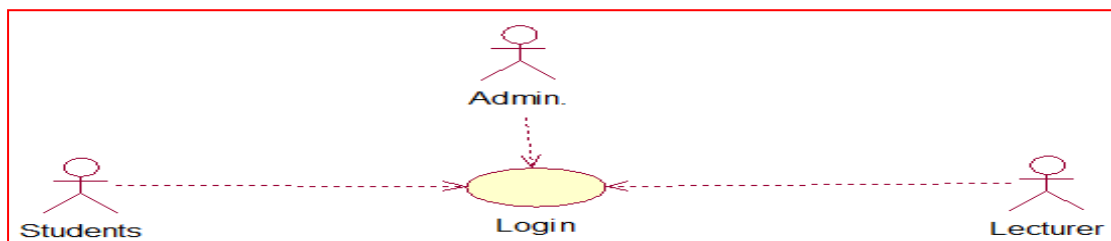


Figure 4.2: Use Case for Login into system

Brief Description	Students and Lecturers can login to the system by using Username and Password
Basic Flow	Students and lecturers need to insert username and password.
	Students and lecturers need to conform the login process by pressing login button.
	The system will respond to his/her order by verifying the login information
Exception Flow	Wrong Username and password: the System will display message invalid Username and Password
	Pre-Condition
Post Condition	The admin must have username and password in order to access the home page.

Table 4.3: Use case specification for Login system

❖ **Download**

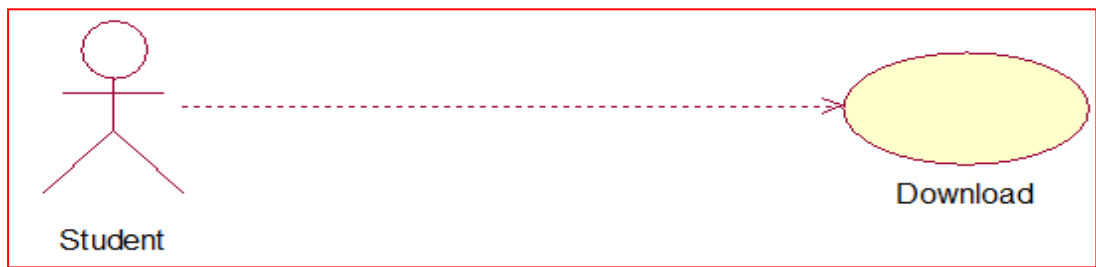


Figure 4.3: Use Case diagram for the download

Brief Description	Students can download any lesson or materials that that uploaded by lecturers.
Basic Flow	Students need to select the download lesson
	After selection student must click the link in order to download
	The system will respond to his/her order by processing
	The system will send the feedback that the download has completed in order to select open or open with folder or location
Exception Flow	Not applicable
Pre-Condition	Students must be login the system by filling his/her Username and Password account and clicking login button.
Post Condition	The download success

Table 4.4: Use Case Specification for download materials.

❖ Use case diagram for View materials



Figure 4.4: Use Case diagram for the View courses and

Brief Description	Students can view any lesson or materials that uploaded by their lecturers
Basic Flow	Students need to select the view lesson
	After student need to press the link
	The system will respond to his/her order by processing
	The system will send the feedback in order view the list download
Exception Flow	Not applicable
Pre-Condition	The student must login the system by his/her username and password System must be running in order to make the operations.
Post Condition	View success

Table 4.5: Use Case Specification for View materials.

❖ Lecturer

The second part user of the system is lecturer, who is doing the following functions:

❖ **Use Case diagram for upload materials**

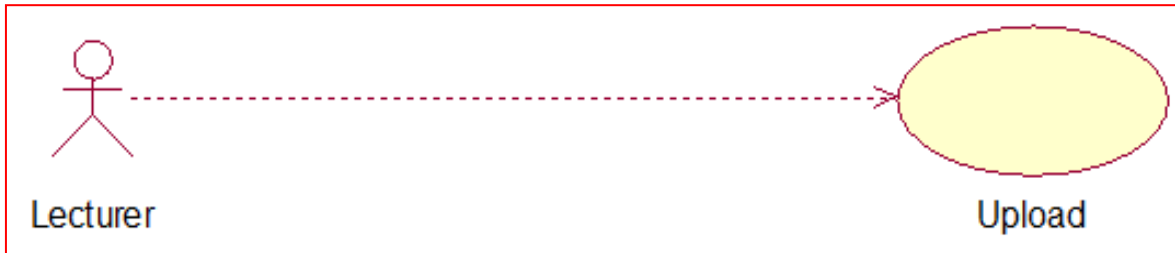


Figure 4.5: Use Case diagram for upload materials

Brief Description	This user case allowed the lecturers to upload any material into the system
Basic Flow	Lecturer must select the type of materials
	After that, lecturer can upload by accomplished the process of upload lesson in order to upload materials
	The system will respond to his/her order by processing of uploading
	The system will send the feedback.
Exception Flow	Not applicable
Pre-Condition	Lecturer must select the materials in order to upload
	The materials must be available
Post Condition	Upload has successful

Table 4.6: Use case Specification for uploading materials

- Use case diagram for View reports by lecturer



Figure 4.6: Use Case diagram for View reports

Brief Description	Lecturer can view any report or materials that he/she has uploaded already
Basic Flow	lecturer need to select the view lesson
	After that, the lecturer may need to press the links
	The system will respond to his/her order by processing
	The system will send the feedback in order view the list download
Exception Flow	Not applicable
Pre-Condition	System must be running in order to make the operations.
Post Condition	View success

Table. 4.7: Use Case Specification for view reports

- Use Case Diagram for Delete materials or comments

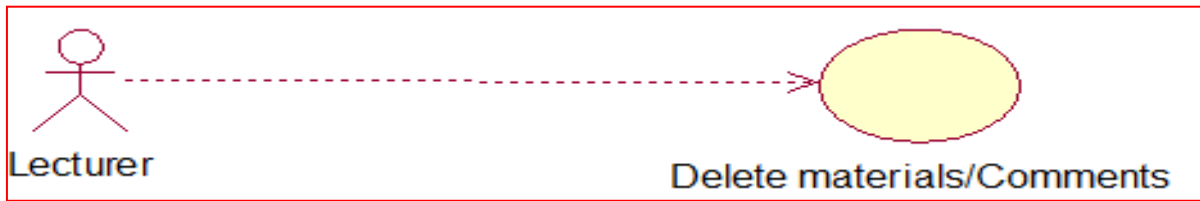


Figure 4.7: Use Case diagram for Delete material or comments

Brief Description	This use case allows the lecturer to delete existing documents.
Basic Flow	Lecturer need to decide and select the deleted documents in order to delete.
	After that, lecturer need to click the delete button
	The system will given conformation about to make sure actions
	The system will send the feedback that the operation deleted
Exception Flow	Not applicable
Pre-Condition	The lecturer must login the system by his/her username and password System must be running in order to make the operations.
Post Condition	Delete materials, comments or notes success

Table 4.8: Use Case Specification for Delete materials for comments

4.4.2 SEQUENCE DIAGRAM

UML sequence diagram are commonly used to represent the interaction among collaborating objects. Reverse engineered sequence diagram are constructed from existing code, and have a verity of uses in software development, maintenance and testing. In static analysis for such reverse engineering (Atanas, 2006). Considerations of actors play a major role. Trust considerations are integrated with behavioral description in order to facilitate analysis of the trust considerations of the actors as well as their resulting behavior (Refsdal, 2008).

❖ Sequence diagram for login.

The means the student and lecturer both of them need to login the system by his/her username and password that available in the database.

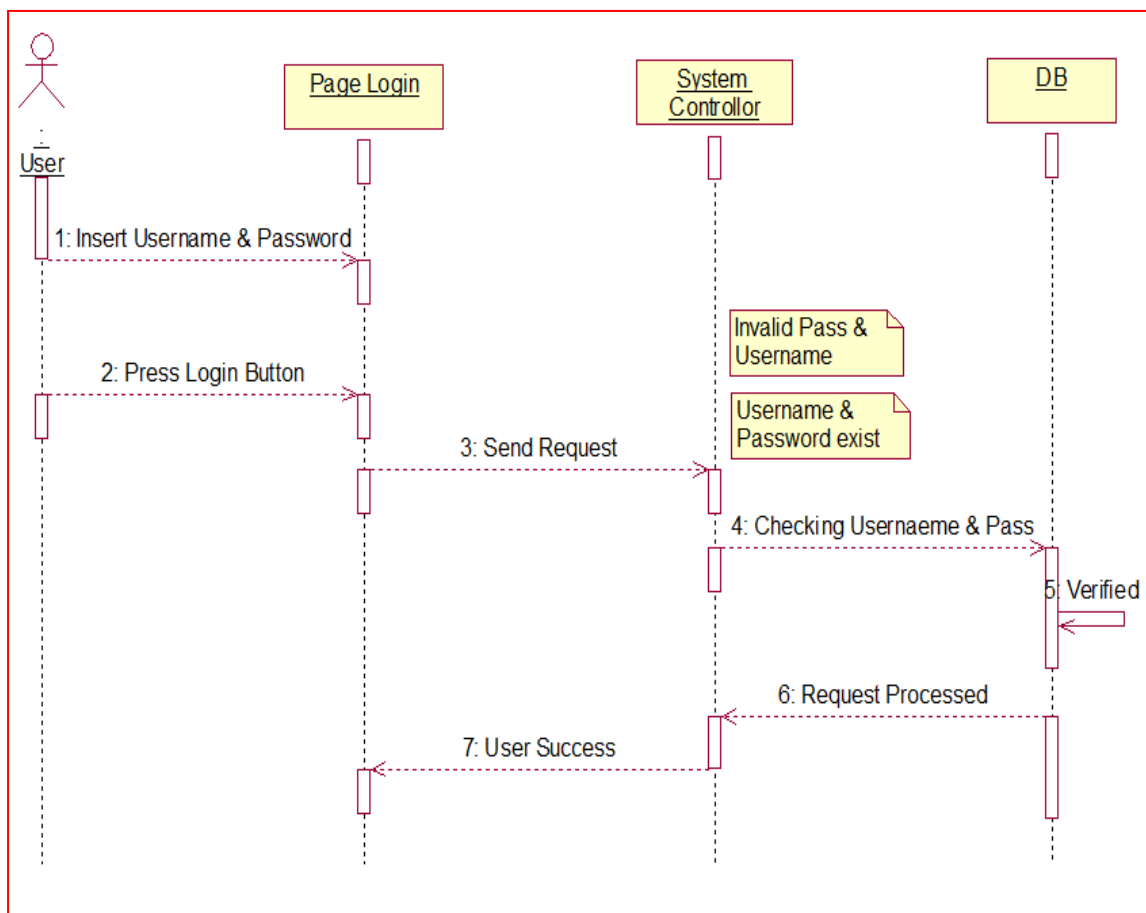


Figure 4.8: Sequence diagram for login the system.

❖ Sequence diagram for Download lesson

This sequence diagram initials by the student to download that the materials.

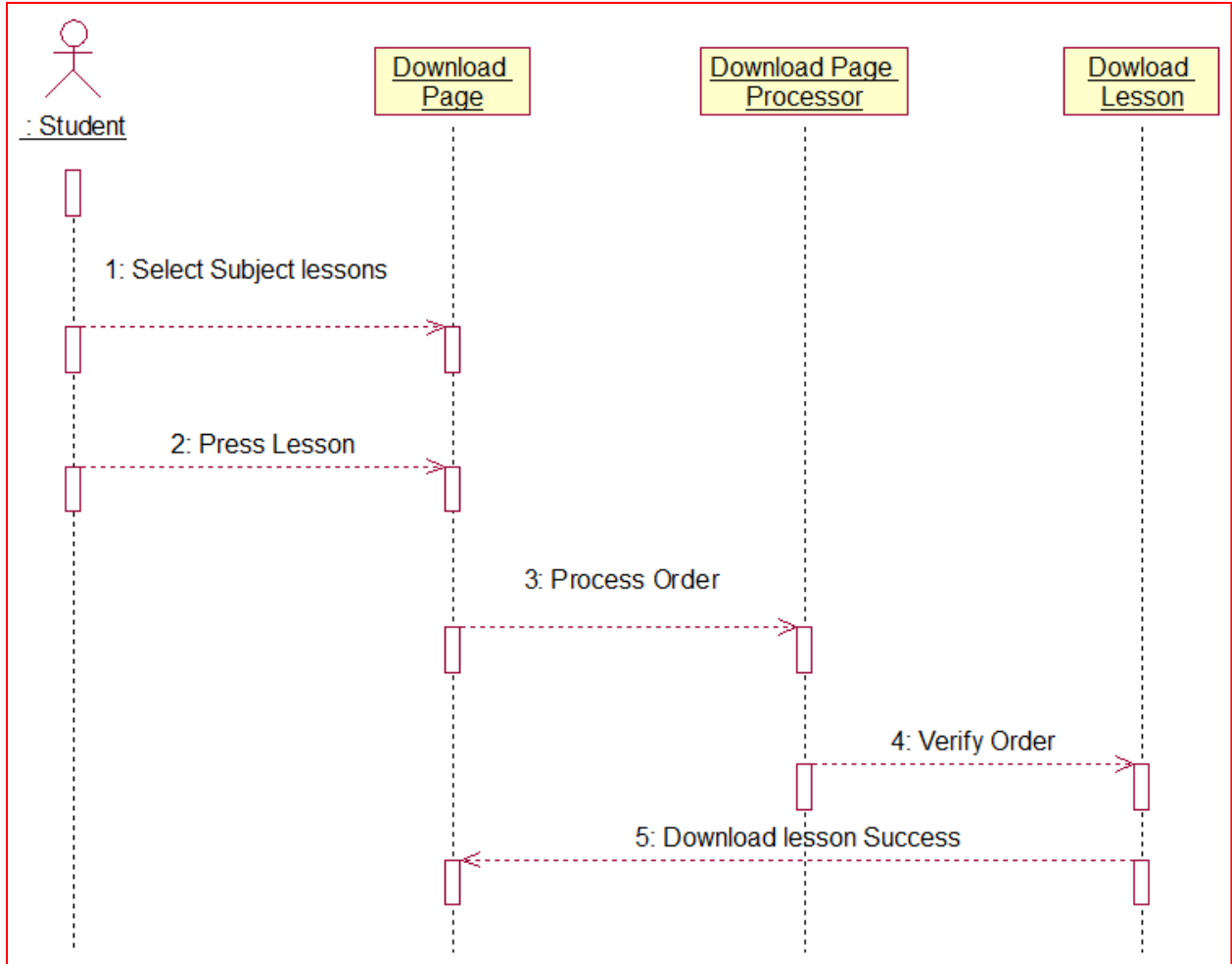


Figure 4.9: Sequence diagram for download materials.

❖ **Sequence diagram for View materials**

Student can view the courses or materials or comments posted by their lecturers.

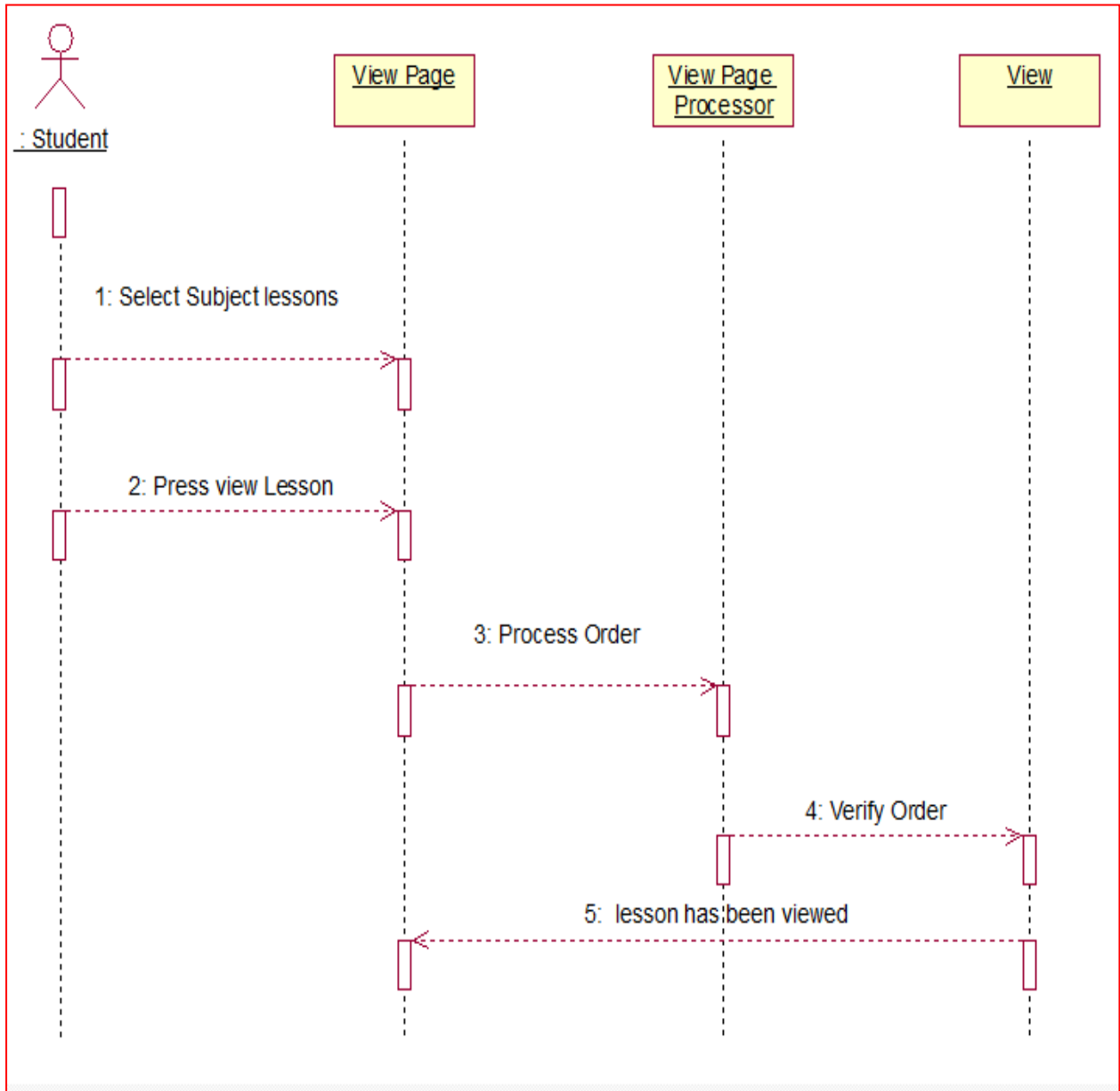


Figure 4.10: Sequence diagram for view materials.

❖ **Sequence diagram for upload materials**

This sequence initial by the lecturer to upload the different type of the course such as documents (PDF and DOC).

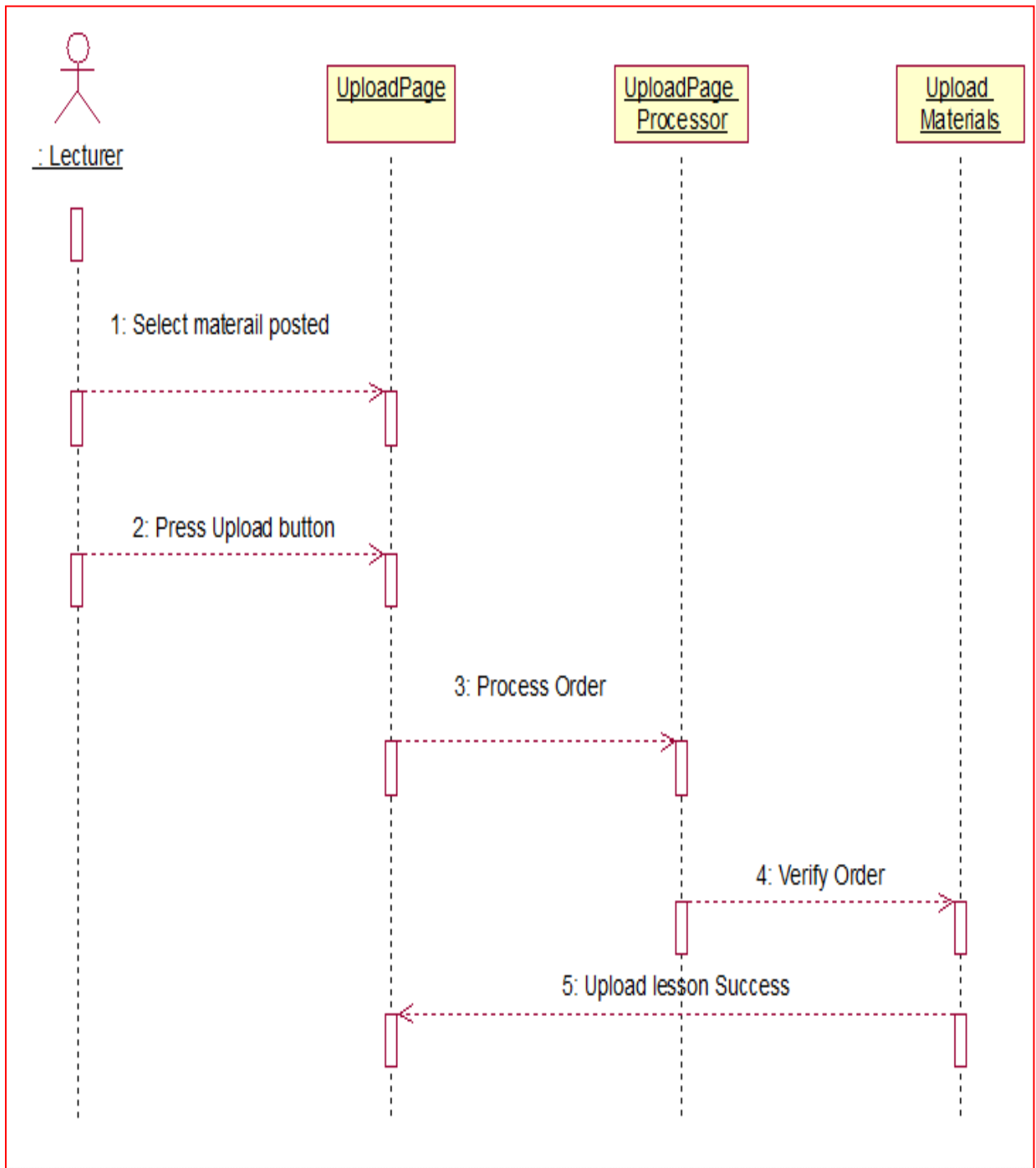


Figure 4.11: Sequence diagram for upload materials.

❖ Sequence diagram for View

Beside to the student, the lecturer also can view report or comments that posted by the students.

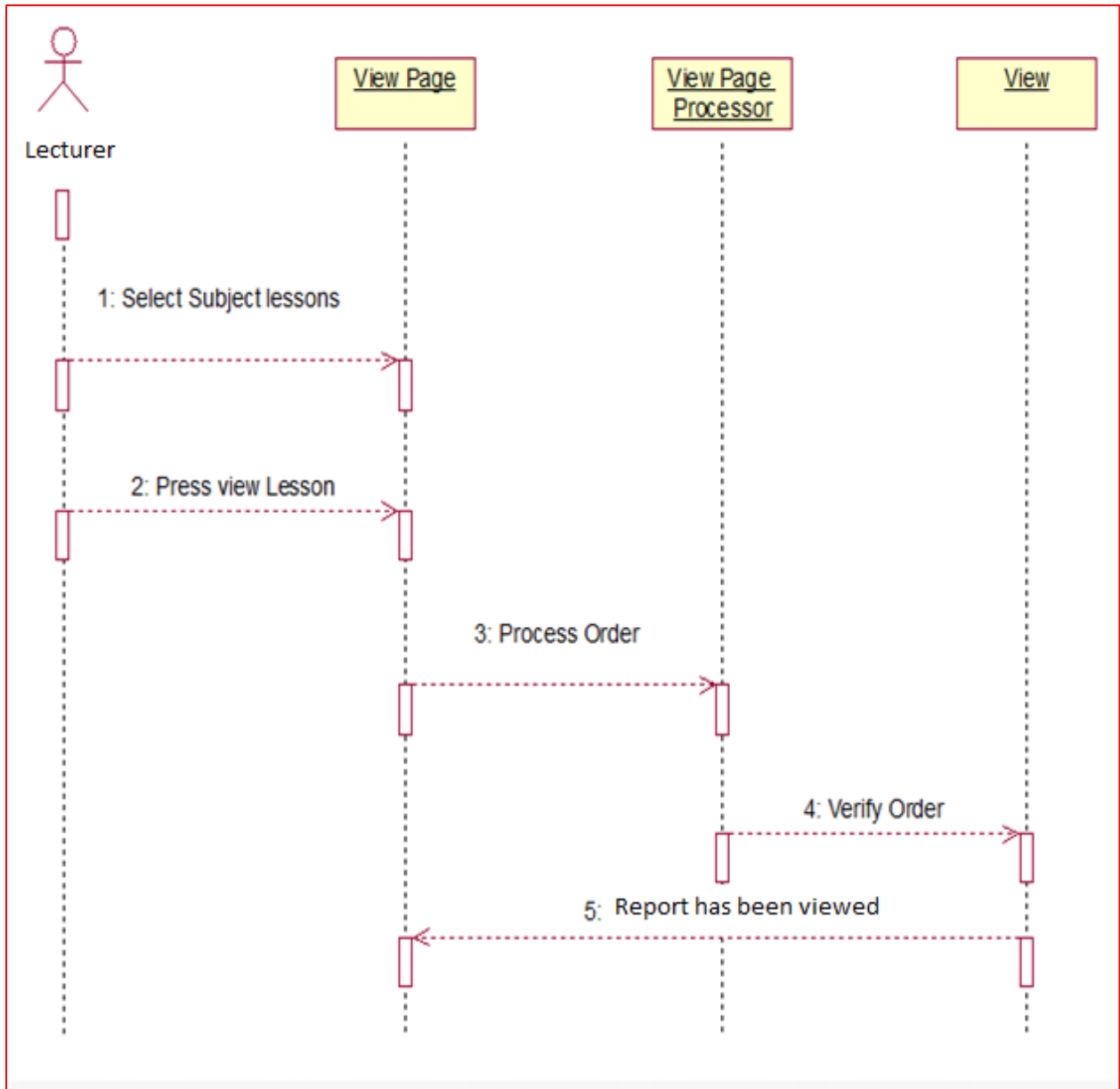


Figure 4.12: Sequence diagram for view materials.

❖ Sequence diagram Delete materials

In case the lecturer needs to delete the existing documents or comments, the system provides the ability to delete those materials.

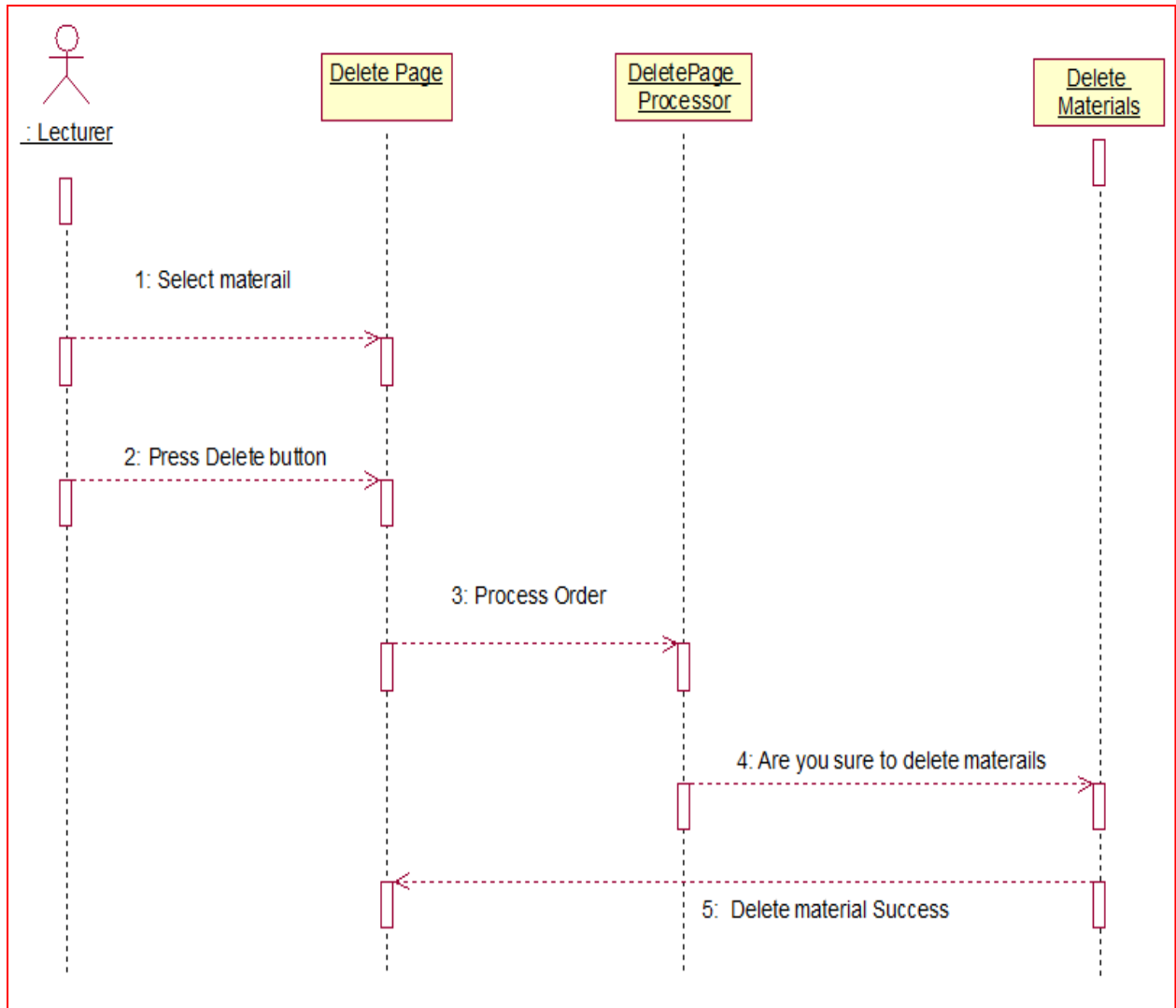


Figure 4.13: Sequence diagram for delete materials.

4.4.3 Class Diagram

In the software Engineering, a class diagram in the UML (Unified Modeling Language) is a type of static structure diagram that describes the structure of the system by showing the system's classes, their attributes and the relationships between the classes. The class diagram for the proposed system E-learning Management System for SIMAD University (EMSU) are shown in the below Figure. 4.22

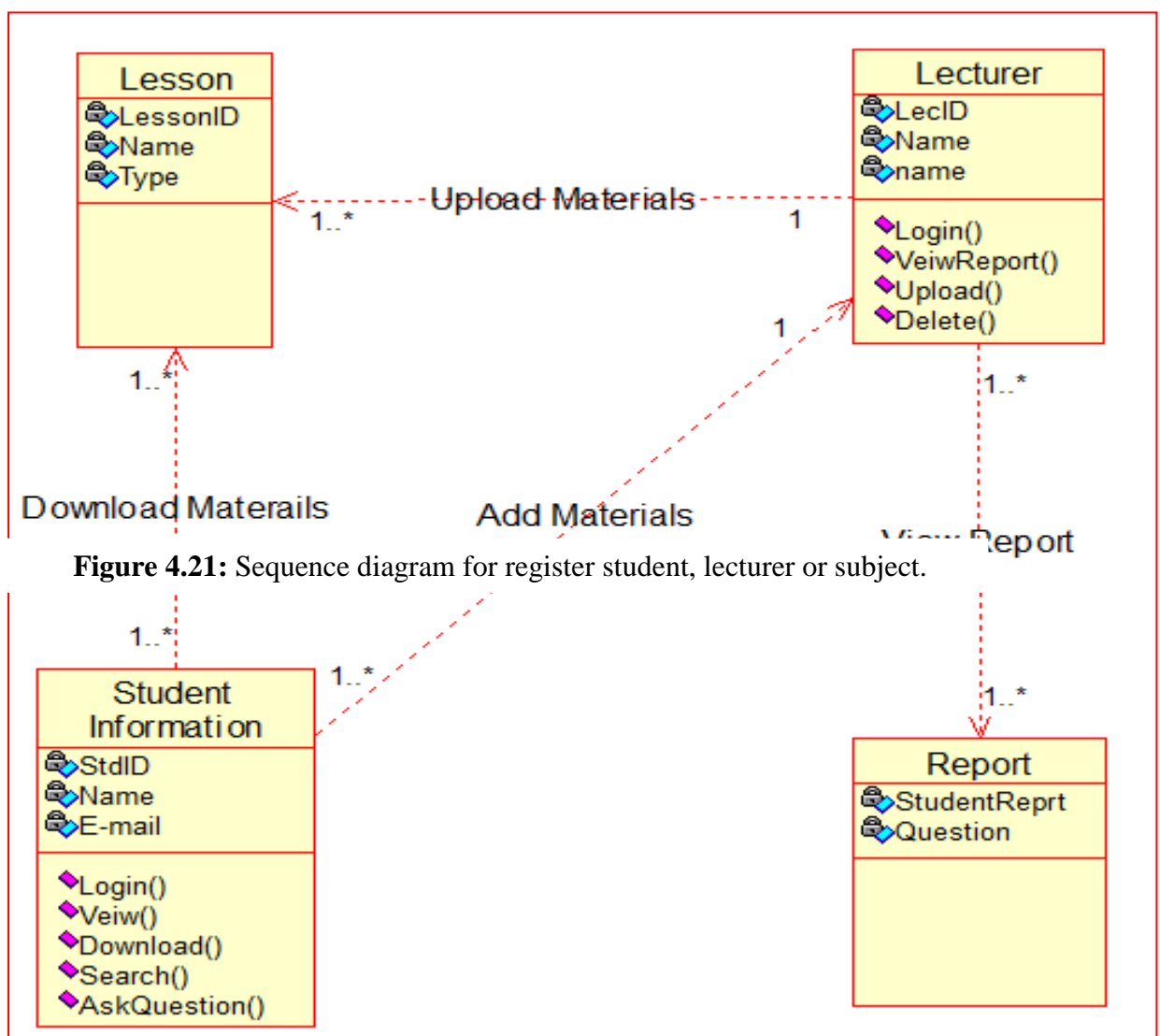


Figure 4.21: Sequence diagram for register student, lecturer or subject.

Figure 4.14: Class diagram for the proposed system.

4.5 **Implementation prototype**

According to Kendall (1996) claimed that after controlling all the requirement and wants of the system, the physical system specifications can be converted to programmers in the performance phase.

4.5.1 **Coding**

Coding is the most important part of the requirements which should be written in order to construct well the system through the programming coding. A study models of system development process is supported by Centre for Technology in government, University at Albany (1998) believed that coding is a programming method phases which is creativity and innovative of the system software. The condition, wants and systems specifications from the design system phases can be transferred into machine readable code of the computer. Therefore, the execution is the critical phase in the study.

4.5.2 **Database**

The simplest definition of a database is a collection of data items, typically describing the activities of one or more related organization, these items stored for later retrieval (Ramakrishnan and Gehrke, 2003).

Computer database is a structured set of documents or data that is stored in the computer system. Reliable data base program to organize storage data. In other words, the software models and the basic structure of data in what is called the models in the database (or data models). Form being the most common use today is the relational pattern. Other models such as the hierarchical model and the model using the network more explicit representation of relationships (Ramakrishnan and Gehrke, 2003).

4.5.3 MySQL

The type of database that has been chosen for development of this project is MySQL. MySQL is a multithreaded, multi-user SQL. The program runs as a server provides users access to a certain number of databases (James, 2002).

4.5.3.1 Advantages and Strength MySQL

MySQL have some of advantage competitors with other types of database as are PostgreSQL, Microsoft's Server, and Oracle. The following advantages for MySQL:

- **High performance:** - There is no doubt promptly. You can see that developers Page mysql.com standard site on the Internet. Many of these standards and show MySQL to be orders of magnitude faster than the competition.
- **Low cost:** - MySQL Is available free under an Open Source license, or Reducing the cost under a commercial license, if required for your application.
- **Ease of use:** - most versions of database use SQL. As a new beginner, I did not have much trouble in using MySQL as it is rather directly forward.

4.5.3.2 Server Side Script

PHP is a general-purpose scripting language originally designed for web development to produce dynamic web pages. For this purpose, PHP code is embedded into the HTML source document and interpreted by a web server with a PHP processor module, which generates the web page document. It also has evolved to include a command-line interface capability and can be used in standalone graphical applications. PHP can be deployed on most web servers and as a standalone interpreter, on almost every operating system and platform free of charge. PHP is installed on more than 20 million websites and 1 million web servers.

PHP was originally created by (Rasmus, 1995). The main implementation of PHP is now produced by The PHP Group and serves as the de facto standard for PHP as there is no formal specification. PHP is free software released under the PHP License; it is incompatible with the GNU General Public License (GPL) due to restrictions on the usage of the term PHP. While PHP originally stood for "Personal Home Page", it is now said to stand for "PHP: Hypertext Preprocessor", a recursive acronym.

4.6 Functionalities Design for the System

The functionalities of the system depend on the user's needs and requirement of the system.

In order to design the functionalities of the system

❖ The main Interface of the prototype



Figure 4.15: Home for the proposed system

Figure 4.15 shows the main page for the proposed system. In order for user to login into the system, the user must click the login button in the system Menu bar.

Login page for the system



Figure 4.16: Login Page

The Figure 4.16 shows the login for E-learning Management system for SIMAD. This page used by lecturers and students to login to the system. The login page determines the user type lecturer or student. Depend on the user type the system navigate to his require page. Both lecturer and student can login the system using valid username and password.

❖ Lecturer login page



Figure 4.17: Lecturer Login Page

Figure 4.17 Displays the system functions that provide to the lecturer to login the system, in this page the lecturer can select topic. If the username and password for the lecturer is valid, the system display the panel for the lecturer in order to upload the materials and the system become functional.

❖ Invalid username and Password page

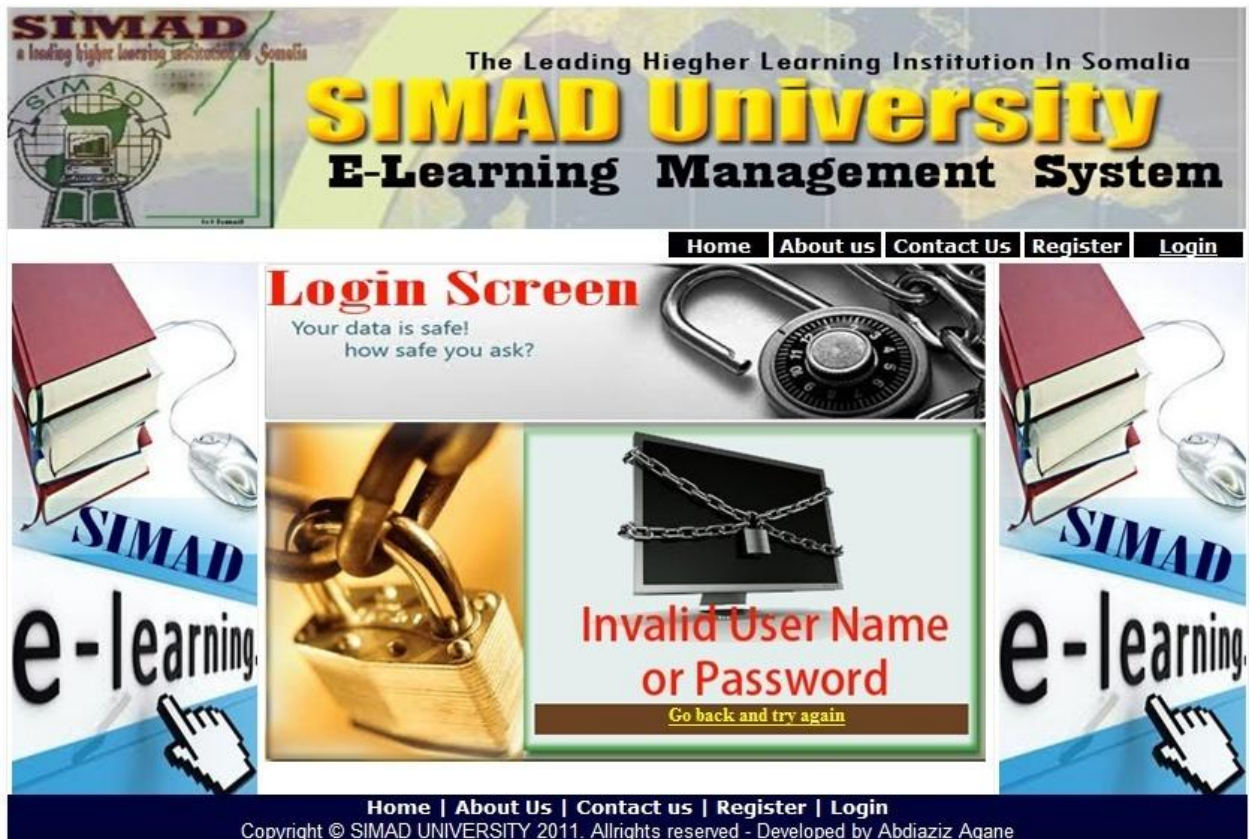


Figure 4.18: Invalid Username and Password Page

In case, student or lecturer enters invalid password and user, the system will display message for invalid username and password go back and try again.

❖ Lecturer Home Page

SELECT CourseID FROM courseconfig WHERE lecturerCode =3

Teachers Portal

Here is Cabasan 's Page !!
Download the below contents

Course List the ID is		
C_Code	Course Name	Actions
1	Distributed System	Selectt
2	Data Structure	Selectt

Home | About Us | Contact us | Register | Login
Copyright © SIMAD UNIVERSITY 2011. Allrights reserved - Developed by Abdiaziz Agane

Figure 4.19: select the subject you want to upload

Figure 4.19: If the lecturer successful to enter the system, this page will display. The subjects or course that the lecturer teaches will select in order to upload the materials to the students.

- Upload Page

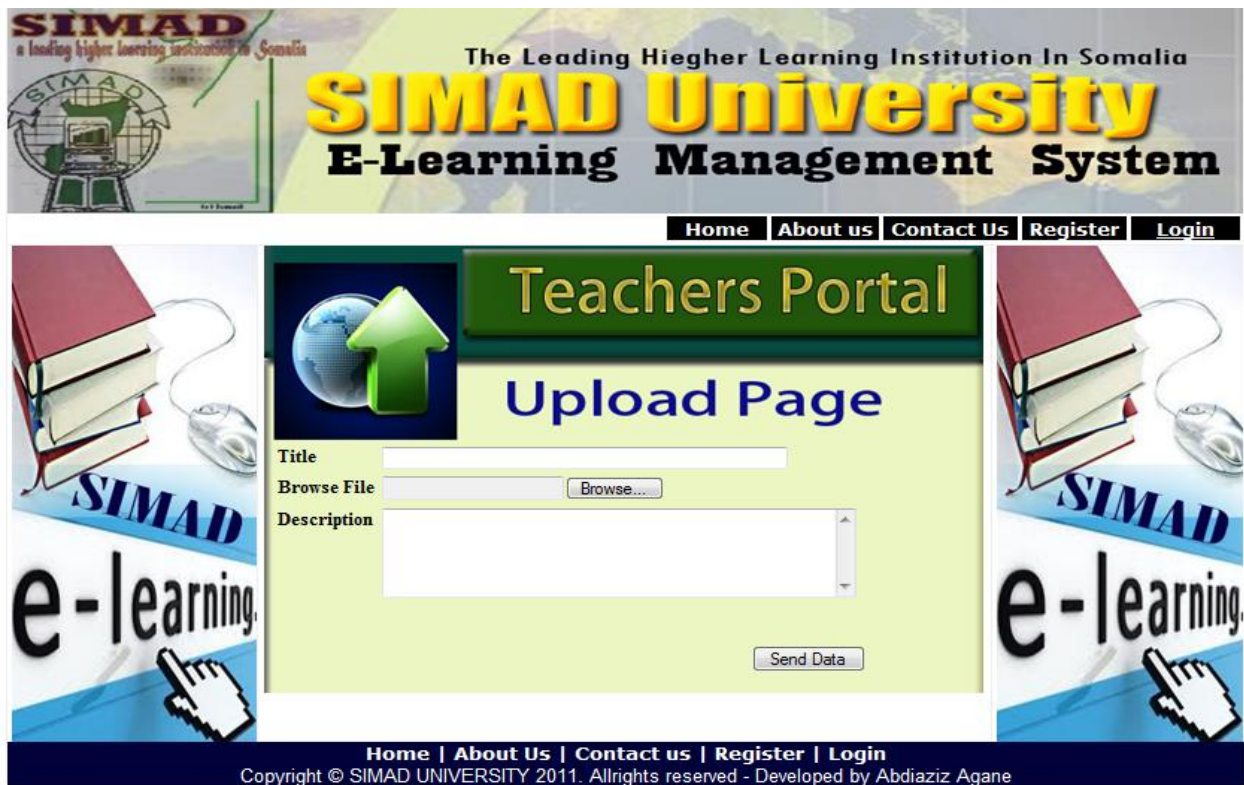


Figure 4.20: Upload page

In order to the lecturer to upload the materials such as PDF, Doc or PPT to students, the lecturer needs to fill the process. First, the lecturer writes the title of the material needs to upload and then clicks the browse button in order to select the materials uploaded, and also description of the kinds of the materials uploaded. Finally, the lecturer clicks the send data button and the system process the upload functions. If the lecturers successfully uploaded the materials immediately, student can read and download it.

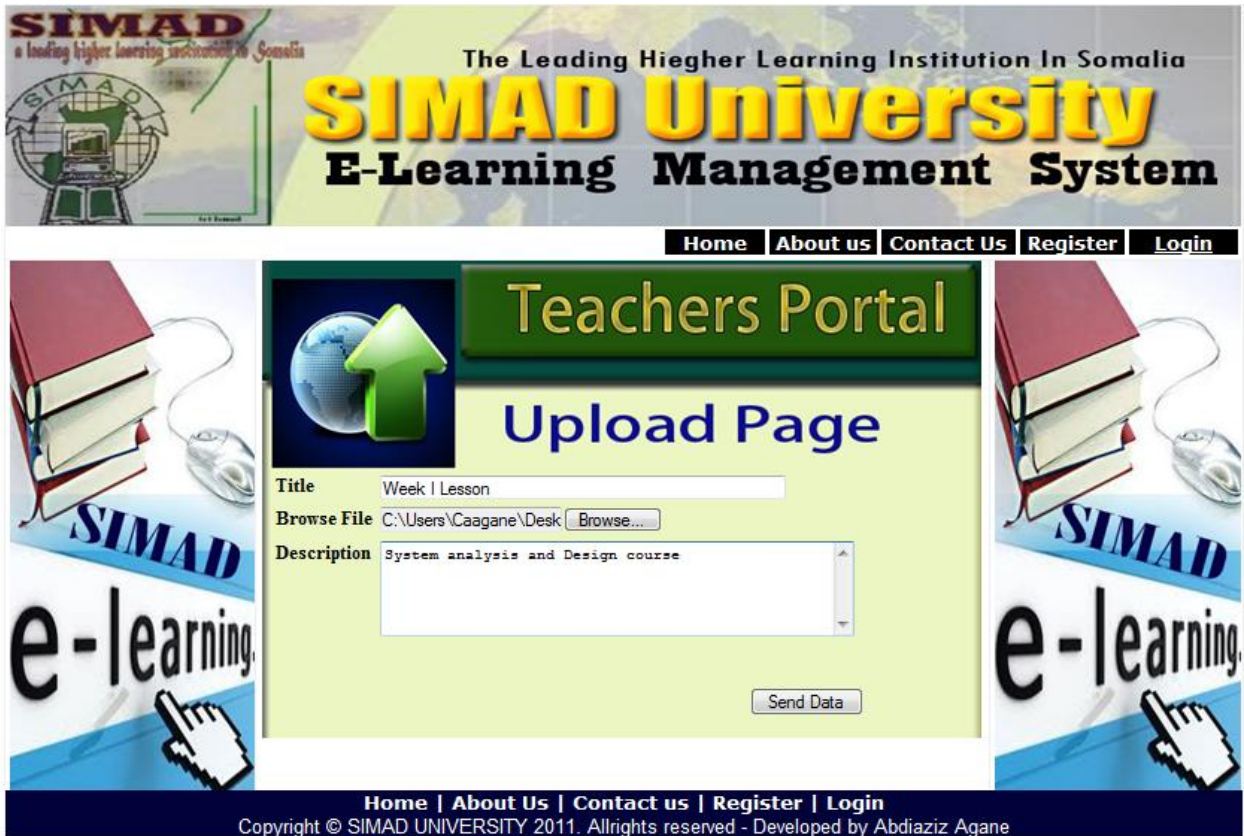


Figure 4.21: The sample process of upload materials

The lecturer can see the material he/she uploaded. In case the lecturer needs to delete or update the lectures he/she can update or delete by clicking the link update or delete.



❖ Student view/download lesson

this page will be initial the student that already have the username and password and already registered in the system, the student will have the ability to view and download the different course materials that he or she want to read or download.

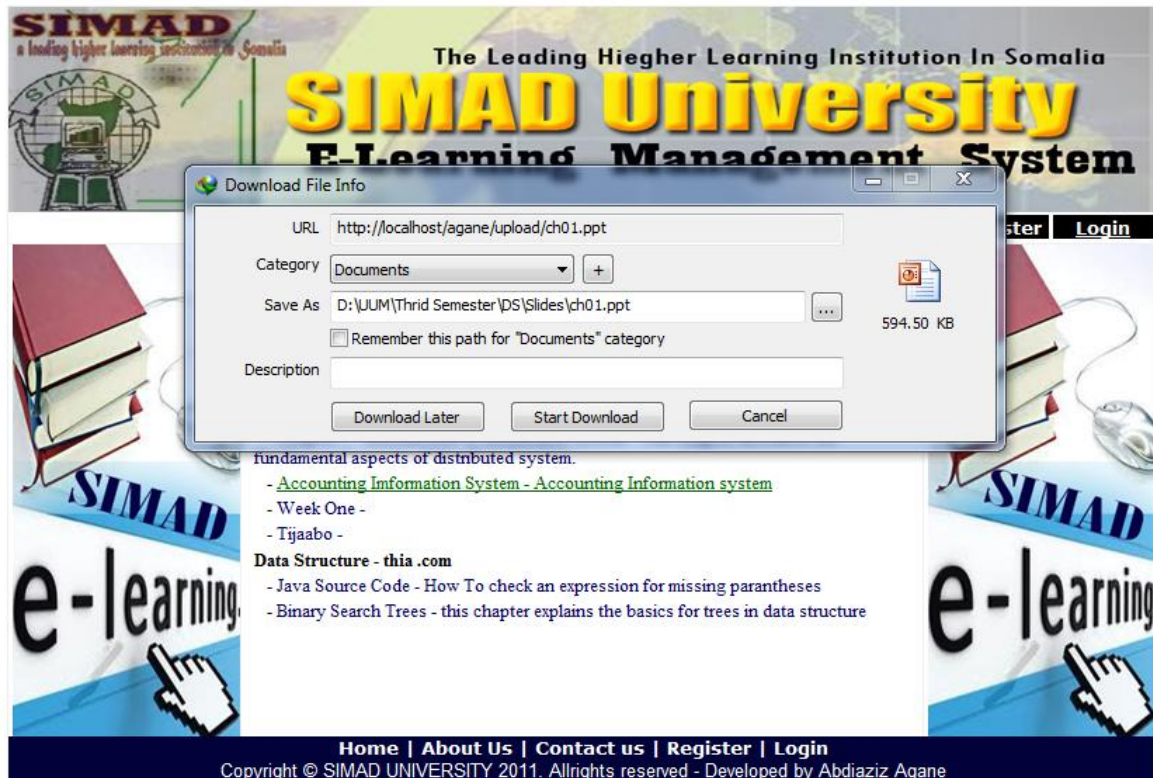


Figure 4.22: Student portal for view materials and downloading

4.6.1 Testing

The purposes of the test discipline are:

- To test the interaction between objects
- To test that all requirements have been correctly implemented.
- To identify and ensure that defects are addressed prior to the employment of the software.

4.6.2 Software testing

Software testing is any activity that had been done to the system aimed at evaluating an attribute or capability of a system and determining that meets required results. Although crucial to software quality and widely deployed by programmers and testers, software testing still remains an art, due to limited understanding of the principles of software (Hetzel, 1988). The difficulty in software testing comes from the complexity of software. The table 4.9 displayed all possibility the user may input into the system and the system response for each possible.

- **System testing**

The description of test case: this test case the general view of the system functionalities

The list of functionalities

NO	Test Data Input	Expected Results	Defect (Y/N)	Severity
1	Page Login in the home page is clicked	Login Page is displayed	N	L
2	Login Page in the home page is clicked	If any exception error occurs, Error Message is displayed	N	L
3	Login page button in the login is clicked	Main Manu page is displayed	N	M
4	Login page button is in the login is clicked	If the any exception errors occurs, error message is displayed	N	M

5	Upload materials page is displayed	Upload materials page displayed	N	M
6	Upload materials page is displayed	If the any exception errors occurs, error message is displayed	N	M
7	Upload button is clicked in the upload page	Documented has been upload successfully	N	M
8	Upload button is clicked in the upload page	If the any exception errors occurs, error message is displayed	N	M
9	Download page is clicked	Download page is displayed	N	M
	Download page is clicked	If the any exception errors occurs, error message is displayed	N	M
10	Download link is clicked in the download page	Download dialog box is displayed and download is completed successfully	N	M
11	Download link is clicked in the download page	If the any exception errors occurs, error message is displayed	N	M

Table 4.9: Testing the proposed system

The errors can be prioritized into high, medium or low.

- **Low priority (L):** Aesthetics, Message wording, Menu options, Wrong alarms, and help problems

- **Medium Priority (M):** When an error occurred leads to another error result in a variation n the functionality
- **High priority (H):** When the application completely stops, the system gets hanged etc.

Chapter Five

Discussion of the Result

5.0 Introduction

This chapter introduces the evaluation phase of the proposed E-learning Management for SIMAD University in Somalia. The student evaluation of the prototype was conducted on 30 respondents.

5.1 Evaluation process of the application

The questionnaire (Appendix B) consists of three sections: General information and User evaluation. The general section functions as mechanism to collect student's demographics. The user evaluation section functions as a mechanism to collect data on user's opinion regarding to the prototype usability testing.

The Statistical Package for social Science (SPSS) version 14 is used to perform descriptive statistics analysis for the collected data.

5.1.1 Evaluation of demographics data

Table 5.1: descriptive statistics for the sample from the gender view

	Frequency	Valid Percent
Valid Male	24	80.0
Female	6	20.0
Total	30	100.0

As it described in the table 5.1 among the 30 respondents, twenty four were male and the remaining six were female.

Table 5.2: descriptive statistics for the sample from the age view

		Frequency	Valid Percent
Valid	18-25	22	73.3
	24-34	8	26.7
	Total	30	100.0

The table 5.2 shows twenty two respondents are between 18-25 year whereas only eight are between 24-34 years. Thus, here there were a great number of young respondents.

Table 5.3: descriptive statistics for the sample from the education view

		Frequency	Valid Percent
Valid	Bachelor	21	70.0
	Master	9	30.0
	Total	30	100.0

The respondents are including master degree and undergraduate, twenty one out of thirty are undergraduate and the remaining nine are master students.

Table 5.4: descriptive statistics for the sample from the study year view

		Frequency	Valid Percent
Valid	First Year	10	33.3
	Second Year	9	30.0
	Third Year	2	6.7
	Final Year	9	30.0
	Total	30	100.0

The above table 5.4 indicates that 10 students are first year of academic and 9 students are their final year of their study. The table also shows 9 students are second year and the remaining 2 students is the third year of the academic year. Hence, the study result shows that there are high percentages of new students.

Table 5.5: descriptive statistics for the sample from the college view

		Frequency	Valid Percent
Valid	CAS	17	56.7
	COB	11	36.7
	COLGIS	2	6.7
	Total	30	100.0

As it described the table 5.5, 17 students are collage of arts and science. There are 11 respondents under the collage of business. The remaining 2 respondents are collage of

5.1.2 Evaluation of the application usability

Respondents were asked to indicate the usability of the application which includes several points such as easy to understand of the information presented by the application and easy to use of the services provided by it. Table 5.6 below shows the Mean and Std. Deviation of each question in the usability section that had been asked to the respondents. Then, and by the Mean we can easily see the agreement of the application usability from the respondents.

Table 5.6: Descriptive statistics of Application usability for all items

No.	Item	Mean	Std. D
1.	The information presented by the E-learning Management System is easy to understand.	4.33	.844
2.	The services provided by the E-learning Management system are easy to use.	4.23	.817
3.	I'm satisfied to use the proposed E-learning Management System.	4.23	1.104
4.	The E-learning System provides the kind of content that I would expect to find E-learning system.	4.17	.913
5.	The proposed E-learning system helps the SIMAD students to get better the communication between student and lecturers in SIMAD university.	4.67	.479

In terms of application usability of the proposed system, the analysis on respondents' background showed that the highest value of the mean is (4.67) and it means that most of respondents agreed that the proposed E-learning Management System supports them to get better in order to improve the learning environment in SIMAD University. Also the mean value of the first question which is (4.33) shows that most respondents agreed that the information presented by the system is easy to understand. In addition, the mean value of question two and three which is (4.23) means that the majority of the respondents are agreed that the services provided by the system are easy to use and also they are satisfied in browsing or using the system.

5.1.3 Evaluation of the application for ease of use

In this step, the respondents were asked to indicate the ease of use of the application which includes several points such as easy to learn the services presented by the application and checking whether the information presented by the system is clear and understandable. Table 5.7 below shows the Mean and Std. Deviation of each question that had been asked to the respondents. By knowing these values, we can easily see the agreement of the application usability from the respondents.

Table 5.7: Descriptive statistics related to the application's ease of use

No.	Item	Mean	Std. D
1	The services provided by the E-learning Management System for SIMAD are easy to learn.	4.10	.923
2	The information that provided by the E-learning Management System for SIMAD is clear and understandable.	4.10	.923
3	Using the E-learning Management System, I can quickly become skillful of using the services provided by it.	4.20	.997
4	I need mantel effort in order to understand and perform the operations using this E-learning Management System.	4.13	.900
5	All the actions and the operations in the E-learning Management System are controllable.	4.20	.847

Table 5.7 shows descriptive statistics for all the items in the Application ease of use distribution. The analysis on respondents' background showed that the highest value of the

mean is (4.20) and it means, most of respondents agreed using the E-learning Management System; I can quickly become skillful of using the services provided by it and also all respondents agree that is, all the actions and the operations in the E-learning Management System are controllable. The mean value of the fourth question which is (4.13) shows that also most respondents agreed that I need mantel effort in order to understand and perform the operations using this E-learning Management System.

5.1.4 Evaluation of the application usefulness and intention to use in the future

In terms of application usefulness and intension to use in the future, the respondents were asked to indicate whether the E-learning system performs the operations within a convenient time. Table 5.8 below shows the Mean and St. Deviation of each question that had been asked to the respondents and by the Mean we can easily see the agreement of the application usability from the respondents.

Table 5.8: Descriptive statistics related to the application's usefulness and intention to use in the future

No.	Item	Mean	Std. D
1.	The E-learning system performs the operations within a convenient time.	4.37	.556
2.	The E-learning Management System responds and reacts to the actions that I perform properly and speedy.	4.13	.1.106
3.	Using the E-learning Management System helps me to download and upload lectures.	4.10	.995

No.	Item	Mean	Std. D
4.	Using the E-learning Management System I can view the course and lectures.	3.97	1.351
5.	The way that the E-learning Management System organized allows me to still use it in the future.	3.90	1.185

In terms of application usefulness and intention to use in the future, the analysis on respondents' background showed that the highest value of the mean is (4.37) and it means that The E-learning system performs the operations within a convenient time. Moreover, most of respondents also agree that The E-learning Management System responds and reacts to the actions that I perform properly and speedy and the value of mean for this question is (4.13). Regarding question three, most of respondents agree that using the E-learning Management System helps me to download and upload lectures and the mean value of this question is (4.10).

Summary

This chapter discussed the evaluation result of the E-learning Management System for SIMAD University. Questionnaire was distributed to 30 UUM students both master and undergraduate students. Thus, the evaluation result of the proposed system E-learning Management System will helped us more to understand the user's requirements and expectations.

Chapter Six

Conclusion and Recommendations

6.0 Introduction

This chapter discussed the conclusion of the study. In addition, it concludes the study contribution and future works towards the using of Web-based E-learning system for providing better support services to the students of SIMAD. The limitations of the research are also proposed in this chapter.

6.1 Conclusion of the study

Based on the objectives of the study that we identified previously in chapter one, we can see that the identifying of the limitations of the current learning environment SIMAD University helps and augment to develop the proposed E-learning Management System which succeeded to overcome this limitations and enhance the communication process between the students and lecturers SIMAD. Furthermore, the proposed prototype E-learning Management System developed using MySQL and PHP technology. In addition, the E-learning Management system prototype has been developed and tested among a certain group of users and the results was quite satisfaction and acceptable.

In order to make requirements more understanding the requirements have been modeled by using some Unified Modeling Language (UML) diagrams such as use case diagram, use case specification and sequence diagram to design the system requirements and give the clear understanding to our objective.

6.2 Study contributions

The main contribution of this study is to improve the learning environment in SIMAD students as well as lecturers through the use of Internet (Web based). On the other hand, the importance of E-learning system proposed by SIMAD is to get students the materials uploaded by their lecturers anytime and anywhere in order to gain competitive advantage of the uses of Information and Communication Technology (ICT) in education. Furthermore, system development is costly and takes time but if the proposed system meets all the requirements, it will save cost and time. Therefore, requirement model UML helps to decrease the efforts in the system development process and increase quality of the developed system.

6.3 Limitations of the research

This study will only focus on developing E-learning Management System for SIMAD University in order to enhance the current limitations of using the traditional face to face contact teaching and learning. However, there are some limitations of the study as following:

- i. E-learning Management System cannot use the all functions for the improving the learning environment in SIMAD such as online quiz, searching, and posting comments functions due to the limited time of the development.
- ii. The prototype cannot allow chatting and discussion directly between students and lecturers in order to maximize the communication between them.
- iii. The functions the system administrator is not working fully.
- iv. The prototype was tested using with local host server namely XAMPP that including MySQL and PHP activity. However, with limited financial resources no actual web Server can be employed in the testing of the prototype.
- v. The prototype evaluation was based on UUM student.

6.4 Recommendations and future works

Due to the time frame that is not sufficiently enough to assure the entire functionalities of the system, future works can be carried out to fill in the deficits that came upon during the work of this project. It would be more suggestive to advice the one who needs to pursue some future works to follow every single step included in the project. The study suggests the following recommendations:

- ✓ To provide online chatting and discussions between the students and lecturers or vice versa. In this case, the communication of the student and lecturers will increase.
- ✓ To provide online class quiz that provides the quality of the study and enhance the task of the lecturers as well as the competitive advantage of Information and Communication Technology (ICT) in education.
- ✓ To support to upload any type of documents including videos and audio.
- ✓ Information regarding this system is trimmed page-to-page navigation down to a minimum and hyperlink buttons are used to navigate back and forth with the page or screen.
- ✓ To provide compatibility used mobile device to take the lesson
- ✓ Provides 24/7 access from any web-browser in the world to the data stored in the custom system.

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SIMAD University

(The Leading Higher Learning education institutions in Somalia)

Dear Participant,

Thank you for accepting to participate in this project.

We would appreciate it very much if you could answer the questions carefully as the information you provide will influence the accuracy and the success of this study. It will take no longer than 15 minutes to complete the questionnaire. All answers will be treated with strict confidence and will be used for the purpose of the study only.

If you have any questions regarding this research, don't hesitate to contact me the address below.

Thank you for your cooperation and the time taken in answering this questionnaire.

Yours sincerely,

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SIMAD University

**E-learning Management System for SIMAD University in
Somalia**

SECTION A: Demographic Background

Please kindly tick (✓) your answers to the given statements.

GENDER :

Male.

Female.

AGE :

18-25 Years old. 26-34 Years old. 35-44 Years old.

PROGRAM

- Bachelor
- Master

YEAR OF STUDY

- First Year
- Second Year
- Third Year
- Final Year

COLLEGE

- College of Arts and Science
- College of Business
- College of Law

SECTION B: Visual aspects of the application usability

Please check the appropriate column. The numbers 1 to 5 represent the following:

1= Strongly Disagree. 2= Disagree. 3= Not Sure. 4= Agree. 5= Strongly Agree.

Question						
1	The information presented by the E-learning Management System is easy to understand.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	The services provided by the E-learning Management system are easy to use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	I'm satisfied to use the proposed E-learning Management System.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4	The E-learning System provides the kind of content that I would expect to find E-learning system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	The proposed E-learning system helps the SIMAD students to get better the communication between student and lecturers in SIMAD university.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION C: Visual aspects of the application ease of use

Please check the appropriate column. The numbers 1 to 5 represent the following:

1= Strongly Disagree. 2= Disagree. 3= Not Sure. 4= Agree. 5= Strongly Agree.

Question						
1	The services provided by the E-learning Management System for SIMAD are easy to learn.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	The information that provided by the E-learning Management System for SIMAD is clear and understandable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Using the E-learning Management System, I can quickly become skillful of using the services provided by it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	I need mantel effort in order to understand and perform the operations using this E-learning Management System.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	All the actions and the operations in the E-learning Management System are controllable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION D: Visual aspects of the application usefulness and intention to use in the future.

Please check the appropriate column. The numbers 1 to 5 represent the following:

1= Strongly Disagree. 2= Disagree. 3= Not Sure. 4= Agree. 5= Strongly Agree.

Question						
1	The E-learning system performs the operations within a convenient time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	The E-learning Management System responds and reacts to the actions that I perform properly and speedy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Using the E-learning Management System helps me to download and upload lectures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Using the E-learning Management System I can view the course and lectures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	The way that the E-learning Management System organized allows me to still use it in the future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

END