DESIGN AND IMPLEMENTATION OF AN ONLINE KNOWLEDGE SHARING SYSTEM

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CHAPTER 1
INTRODUCTION

1.1 BACKGROUND INFORMATION

A first step in postulating a theory of mobile knowledge sharing system is to differentiate what is special about online knowledge sharing system compared to other types of knowledge sharing systems. An obvious yet essential difference is it starts from assumption that organizations that encourage or practice knowledge sharing are continuously on the move. Effective knowledge sharing is of great importance as a foundation for knowledge management in organizations (chumg et al., 2016). Through effective online knowledge sharing among employees in an organization, organizations can improve their profile and gain market opportunities, enhance performance and increase their competitive advantage in an uncertain environment.

In today's business world, online knowledge sharing systems are very much essential in other to store and preserve knowledge within the organizations and make decision and problem-solving processes faster and easier. The truth about online knowledge sharing systems is that every organization aimed at rapid development needs an online knowledge sharing system. An organization in which knowledge sharing is not practiced is prone to slow development, knowledge hoarding and slow response to problems and decision-making processes. To prevent this, we use technology. This has resulted in what we know today as online knowledge sharing system.

Knowledge sharing is nothing new, for hundreds of years owners of businesses and experienced employee have passed their commercial wisdom unto their families or other employees using traditional methods of knowledge sharing. But it wasn't until the 1990's that researches started talking about online knowledge sharing. The traditional methods of online knowledge sharing system was questioned by asking what happens when an employee refuses to share knowledge? What happens to the organization when an experienced employee leaves or dies without passing

2

knowledge to another person? They concluded that the invention of E-knowledge sharing system will help answer these questions.

The traditional method of using passing knowledge through interactions is still very good, but that cannot keep up with our world today where information is traveling at the speed of light and things change at the speed of thought.

1.2 STATEMENT OF THE PROBLEM

The day to day activities of employees in an organization is also quite tasking. There are a lot of problems to be solved, important projects to be completed and things in which they need to remember as it relates to the organization. It would be better and more profitable if the organizations are able to develop a system in which individuals can quickly log on to and find related answers to their problems as well as finding pervious work done by other employees in other to increase problem solving speed. Individuals can also post their solutions to problems in form of posts on these systems for other people to gain knowledge from.

1.3   AIM AND OBJECTIVES OF STUDY

The aim of this project is to design and implement an online knowledge sharing system that organizations can use to store and share knowledge

Objectives of this project includes:

  i.   To gather information from the knowledge expert.
 ii.   To design and model the E-knowledge sharing system.
iii.   Building of the search engine.

1.4 RESEARCH METHODOLOGY

Research methodology of this project goes further to explain the best methods intended to achieve the stated objectives.

Objective 1: To gather information from the knowledge expert.

In order to gather information to the knowledge expert, the system provides a platform in which experts can upload and share their knowledge, to store these uploads, MySQL database is used to store information provided by the knowledge expert.

Objective 2: Design and model an E-knowledge sharing system

To design and model the system, UML was used for the system modelling and design. Diagrams such as sequence, activity and use case was used to model the system. A use case model is used view of system that emphasizes the behavior of a system as it appears to outside users. the sequence diagram is used to flow of messages, events, and actions between objects.

Objective 3: To build the search engine

This objective will be achieved by implementing the search on a web application, to search the uploads (pdf and text documents) Ruby on rails library PDF reader will be used to read through the document and return the search queries that was found. To search the users and comments regex will used to match the search queries to the database.

1.5 SIGNIFICANCE OF STUDY

The role technology has played in enhancing learning and knowledge sharing in organizations cannot be over emphasized, little contributions of knowledge from various employees over time can form a very large repository of knowledge base over time. An organization using an online knowledge sharing system would be generally more productive than an organization that doesn't use it, this therefore implies that every organization seeking to grow fast should have an online knowledge sharing system.

1.6 LIMITATIONS OF STUDY

- At first release, the web application may not have all the features desired by the client.

- Due to time constraint, the first release of the web application may not have all the intended functionalities, though the future updates will have.

1.7 PROJECT OUTLINE

Chapter 1: This chapter provides a detailed background study of the system being developed, the aim and objectives, the methodology used for research, and the study's significance and limitations.

Chapter 2: This chapter provides an extensive project information from existing projects and a summary of literature review which consists of researches, journals, articles reviews and books related to E-knowledge sharing system.

Chapter 3: This chapter presents the E-knowledge sharing system and its system design, which includes the physical and logical design, it presents the system architecture and conceptual design of the application

Chapter 4: This chapter contains the online knowledge sharing system implementation, the were tools used, the development methodology, interfaces and system development process.

Chapter 5: This chapter contains the general overview of the project, the conclusion and recommendations for future research related to this project.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Whether it's a large or small organization, knowledge is considered to be one of the most important aspect of present-day business organizations. Almost all types of organizations are now keeping trust on knowledge-based resources to gain competitive advantage over similar organizations (Kuruppuge and Gregar, 2018). It is worth to add that it is in the interest of an organization that the employees do not keep their knowledge to themselves but that they share it to other members of the organization (Matoskova and smesna, 2017). Knowledge sharing plays a very important role in organizations today, as these organizations devote mass resources into building and promoting knowledge sharing in their organizations. Therefore, it is necessary to know the importance of knowledge sharing, forms of knowledge sharing in organizations, methods to improve knowledge sharing among employees, factors affecting knowledge sharing and the effects of knowledge sharing in organizations.

2.2 HISTORY OF KNOWLEDGE SHARING IN ORGANIZATIONS

One of the earliest forms of knowledge sharing started in the early 1500BC and it took place in form of cave drawings. After this period, documentation became more advanced and this evolved from using imagery to alphabets, and from writing on walls to using scrolls. Academics and monks took up the responsibility of interpreting books and organizing encyclopedias, and stored these knowledges acquired in exclusive libraries. In 1440s the invention of printing was developed and that was the first-time knowledge was able to be shared among businesses and individuals easily via print material.

Rapid changes in knowledge sharing started with real-time audio broadcasting in the 1990s. then, the invention of the internet in 1980s was also introduced. As relevant information became more and more accessible, it became difficult for organizations to function without these technologies enabling this new level of connectivity among employees in the organization. It became clear to

organizations that a means for managing the excess and incredibly useful information was greatly needed.

Research in recent time shows that organizational consultants were among the first set of professionals to seriously explore and consider the best means for knowledge sharing with the organization. Consultants found out that some organizations use person to person interactions (tacit) methods to share knowledge whereas others used computers to codify and store knowledge. The use of computers not only allowed them to share knowledge electronically but to communicate, store and preserve knowledge acquired over time. As organizations grew and technology improved immensely, one lesson learnt by organizations is that "the death of knowledge is to isolate it" (Alexander, 2018).

The concept of knowledge sharing isn't new, but how we convey information is what is changing drastically. Though we once focused on simply sharing knowledge, leaving it up to predecessors and academics to record, organize, and interpret such materials, we now understand the importance of businesses and organizations to remain competitive in the global marketplace while using E-knowledge sharing systems.

As networked computers made it possible to store and share knowledge more easily than any other period in history, business pioneers have begun to recognize the value of knowledge and how capturing and sharing it could impact their business positively. The incentives for companies and organizations is vast, from increasing efficiency to eliminating redundancy, but the benefits and applications are still being realized as technologies improve.

2.3 KNOWLEDGE SHARING

knowledge sharing is defined "the process of transferring knowledge from a person to another in organization. It is a process to accumulate shared knowledge among members" (Park and Im, 2003). It can also be defined as a kind of social interaction among people (Bock and Kim, 2002). Knowledge, unlike information and is locked in the human mind and part of human identity. Frappaolo,(2006) claimed that knowledge sharing is about "how people share and use what they know". In addition, (Tasminand Woods, 2007) asserted that knowledge sharing as a social system that supports collaboration and integration which is normally facilitated by technology.

Dalkir,(2005) also supported the defined notion that knowledge sharing is to be associated with "appropriate mix" of technological channels for optimizing knowledge exchanges. Creating and exchanging knowledge are intangible activities that can neither be supervised nor imposed.

2.3.2 FORMS OF KNOWLEDE SHARING

Managers in organizations today are extremely concerned with the implementation of knowledge sharing practices in their organizations. They face various challenges in implementing and developing knowledge sharing methods. Knowledge sharing is classified into two forms which are "tacit knowledge "and "explicit knowledge"(Saufi and Tasmin, 2010).

2.3.2.1 TACIT KNOWLEDGE

Tacit knowledge is defined as the personal knowledge contained in an individual's experience and involves factors such as personal belief, perspective and value system (Nonka and Takeuchi, 1994). Tacit knowledge is what is contained in the human mind and can be communicated through ability application and transferred through watching in the form of learning (Lee and Choi, 2003). Nonaka's spiral model of knowledge sharing explains that new knowledge always starts with an individual (e.g. a new staff in an organization has insights that leads to a manger, the individual draws on years of experience to develop a new process innovation).

In cases like this, personal knowledge of an individual is converted into the organization knowledge and it extends through the organization which is very important to the company as a whole. The central activity of the knowledge and development created in an organization should be to make individual knowledge available to others, this takes place continuously at all organization levels. An organization creates a process of knowledge conversion through these interactions (Nonaka et al 2000) these four modes of knowledge conversion form a spiral, the SECI process.
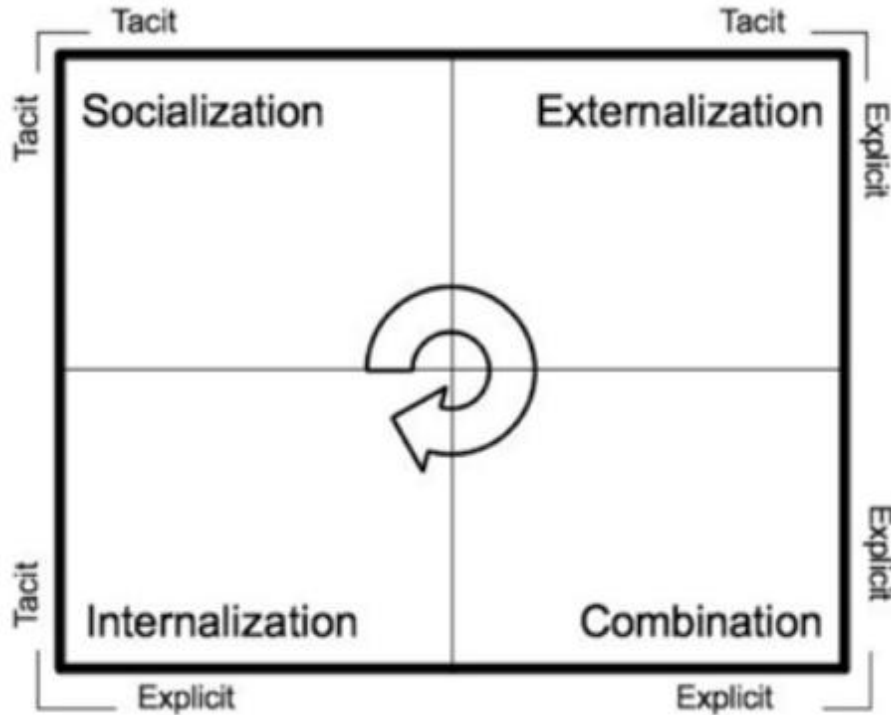
Figure 2.1 SECI Process by Nonaka Takeuchi, 2000

2.3.2.2 EXPLICIT KNOWLEGDE

Explicit knowledge is the kind of knowledge that can be documented and codified easily. Explicit knowledge can be written down, followed and communicated verbally or through computer programs, diagrams, patents and information technologies (Calo,2008) among organization units. Due its ability to share, explicit knowledge is easier to capture and distribute because of its ability to be transmitted in form of tangible material.

However, while explicit knowledge is easier to transfer, the transfer of explicit knowledge still present obstacles, one major issue is that the interpretation of the explicit knowledge made available is often left to the person using the material (Parise et al.,2006).

2.3 FACTORS AFFECTING KNOWLEDGE SHARING

Existing literatures on knowledge sharing have shown behavior among employees that there are many factors that can affect knowledge sharing and these factors are grouped into three major

9

categories which are; individual factors, group factors and organizational factors (Pangil and Mohd, 2013).

Knowledge sharing behavior of individuals are fundamentally personal traits that affects knowledge sharing. Openness personality is one the characteristics an individual has that tends to make individuals have high level of curiosity to seek other people's opinions. While some individuals with high introversive traits are more reserved and bad at communication have a tendency to avoid social interactions (Zhou et al., 2014) this is not good for knowledge sharing. Also, individuals with proactive personality explore new was to affect the external environment through their active behavior and this has a positive effect on knowledge sharing (Zhang et al., 2016).

Furthermore, one of the motive factor for difficulty in sharing knowledge is fear (Yi et al., 2008). Knowledge holders generally have an exclusive frame of mind which is the main reason for their unwillingness to share. Knowledge holders fear superiority and are worried inequalities exist in knowledge sharing and this leads to the sharing of knowledge being difficult.

Trust also affects knowledge sharing, Research showed that when people thought team members were very capable, individuals would be less tendency to share knowledge, while they believed that the team members were honest, fair, honest, and they were more inclined to share knowledge (Wang and Noe, 2010).

Knowledge sharing requires a good interaction among team members, for improved communication opportunities and willingness to share. The differences among team members are important, when the differences are too immense, it hinders knowledge sharing among members (Liu and Jia, 2012). Ojha (2005) in his study stated that; when the team members think that they were the few people in their team, such as: gender, marital status, level of education of the minority, then they were less prone to knowledge sharing. Studies had shown that isolated members of society are less likely to agree with the others, and they would not contribute their knowledge in a heterogeneous team.

Knowledge sharing behavior of organizations involves information technology, although information technology is not the only important aspect in knowledge management, it can make knowledge sharing more efficient. Because companies can't have long-term human capital, so

many companies choose to use information technology to facilitate knowledge sharing to retain organizational knowledge and to facilitate knowledge raising from the individual level to the organizational level (Yi et al., 2008).

In addition, organizations with creative culture would support staff interaction to en- courage them share experiences, ideas and other tacit knowledge. therefore, knowledge sharing at organizational level requires company to pay more attention to the culture of creative and the exchange of ideas that can positively affect the action of knowledge management. In other words, innovation culture is the most important factor to promote knowledge sharing at organizational level Zheng (2017).

An organizational culture which emphasis on individual competition will have knowledge sharing issues while organization with sense of cooperation will help to build trust, which is a necessary condition for knowledge sharing (Wang and Noe, 2010).

2.3.1 IMPORTANCE OF KNOWLEDGE SHARING

(Pangil and Mohd 2013) explained that knowledge is a difficult concept to discuss, in other to be able to share knowledge efficiently, individuals, groups and organizations must be able to understand the importance of sharing knowledge.

There are many ways in which knowledge sharing can profit an organization. One of them as stated by (Nonaka, 1994) is that the dialogue required amid knowledge sharing often leads to new ideas being generated which is considered to have potential to create new knowledge as a result it improves efficiency in marketing and organizational innovation (Chen, 2006).

The sharing of knowledge also helps in organizational learning and individual learning and when absent the gap between organizational and individual knowledge widens (Ford and Chan, 2003).

Furthermore, if the individuals in an organization engage in knowledge sharing, the organization can avoid redundancy in knowledge production while ensuring that best practices are disseminated within the organization (Husted and Michailova, 2002). In addition, Husted and Michailova (2002) also claimed that periodic knowledge sharing between organization members allows the organization to find solution to problems by making relevant personal knowledge available to the

problem-solving process irrespective of where the knowledge was originally obtained in the organization.

Most importantly, the beauty of sharing knowledge is that knowledge grows and develops when it is utilized and imparted to another and it devalues when kept to oneself (Syed-ikhsan and Rowland, 2004)

2.4 KNOWLEDGE SHARING SYSTEM

Today, knowledge sharing systems go from the simple to the complex. As technology keeps changing and advancing today, there is an important need for. knowledge to be shared in organizations and soon every organization would need an effective knowledge sharing to share knowledge acquired by employees.

There are existing knowledge sharing systems available today on the internet. The internet is a global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication. Some applications can either be web applications or mobile applications.

2.4.1 KNOWLEDGE SHARING SYSTEMS REVIEW

Baju Kehinde Kolawole, Babalola Yemisi Tomilola, A study of the design of a web-based knowledge sharing system for Babcock university school of post graduate studies, 2017. The study shows that knowledge sharing is an important aspect of knowledge creation and the platform called "mindshare" encourages innovation of ideas among staff and student of the university. The methodology used for the research was done by conducting a research in which students of the school identified the need for a knowledge sharing system, the system was created to work with browsers like chrome, Mozilla Firefox and safari. The design model was made with modified model view, the main programming language used was PHP and the database were made with MySQL. Features of the system include; users can post word or pdf documents, share documents, start discussions, comment on posts and a search function. Recommendations of the system involves other universities adopting similar system in their local environment.

Wasiwasi J. Mgonzo, Zaipuna O. Yonah, Design and Development of a Web Based Digital Repository for Scholarly Communication: A Case of NM-AIST Tanzania, 2015. The aim of this study was to develop and design a web based digital repository for scholarly communications which was proposed for the Nelson Mandala African institute of science and technology (NM-AIST). The methodology of the system was achieved by visual paradigm for the UML software is the DFD which was used to describe the system overview. The software that were used in development are the Apache Tomcat, Apache Ant, Apache Maven, PostgreSQL relational database, java development kit (JDK) and developed using Dspace repository software which was selected by consulting a survey for different software repositories to select the best to use. For the system design, dataflow diagram was used and it consists of DFD level 0-2. The system also consists of three possible users which are the administrators, authors and users. To implement the system, Apache Tomcat was used to create web server, Apache Ant which is the Java-based build tool, Apache Maven which is the software management tool, PostgreSQL which is used for creating the database, Java development environment was used in programming the system. The recommendation of the system states that the system should be evaluated after some years.

Kalyain U. Sapre, S.W.Ahmad, A web based knowledge management system, department of computer science and engineering, Amravati university, 2016. The study explains the system which is called "knowledge forum" as an information management system which encompasses the process of capturing, distributing and effectively utilizing knowledge. System analysis for the system was carried out by conducting a research to discover the functional and non-functional requirements of the system. The system design and modelling were achieved by using a 3tier architecture and flowchart diagrams to design and model the system respectively. The system was implemented. The features of the system include data confidentiality, registration, question and answer, create papers, create seminars, upload papers and save files. The limitation of the study was stated that not all the users (students and teachers) can be motivated to share what their knowledge therefore the system would not achieve objectives if users do not share their knowledge. Recommendations of the system was for other institutions develop similar system.

Zeng Qun, Zhong Xiaocheng ,The Design of Individual Knowledge Sharing Platform Based on Blog for Online Information Literacy Education, 2015. This paper analyzes knowledge sharing as an aspect of knowledge creation in which individuals, teams, and organizations share knowledge with other members for specific activities in different ways. For this paper, a blog technology was used as a platform for knowledge sharing amongst individuals. The paper also analyzes the obstacles in knowledge sharing on a blog which includes; human factor and knowledge characteristics. The design architecture for a blog as stated in this paper include a 3-layer system which are the user layer, application layer and knowledge layer. The features of a blog knowledge sharing system includes knowledge search, personal knowledge management, knowledge track and interactions. The limitation identified in this study is the time constraint and space.

Veruska Costa, Fabio Ferreira Batista, A study of Ipeas's knowledge repository, 2015. This paper discusses Ipeas's (Institute of Applied Economic Research) knowledge repository as an online platform designed to preserve, share and manage the institution organizational memory. It is a platform in which the organizational tacit and explicit knowledge can be shared. The features of ipea's repository includes; search tools, search by topic, storytelling and browse by author, subject and date. The implementation tools used for the system are Dspace software, Linux operating system, Java JDK 1.7+, Maven 3+, Ant 1.7+, and for the database PostgreSQL 9.X were used. The recommendation of the system includes to build a lesson learned system in the later future and best practice system as well.

Eldho Joy E, the design and development of a web-based knowledge sharing system model for the university libraries of Kerala, 2016. The aim of this study is to create an online platform in which the library resources of various universities in Kerala can be made available to both staff and students. The need for this system arose due to the fact that IT technology is evolving and traditional library knowledge sharing procedures are becoming obsolete. The methodology of this study was carried out by conducting a sample survey of academic librarians among libraries of Kerala by using questionnaires, interviews and observations to obtain data. The hypothesis for this

study includes assumptions that the university libraries of kerala do not engage in re-orientation services, the staff of these university libraries do not have prior knowledge of work in digital era and training programs are needed. The hypothesis gave rise to the requirements of the web-based system for the online knowledge sharing system for the universities of kerala. The limitation of this study is that not all universities in kerala have an established library.

Adedeji Folashade Mary, development of a web-based knowledge sharing system for organization: case study internet service provider, 2017. This study focuses on the need to preserve and document skills used in the daily activities of a selected service provider in other to increase the organization's competitive advantage. The objectives of this study include to develop a web-based system that stores, captures and shares knowledge needed to solve problems and to provide a means for easy retrieval of information. The methodology applied include to conduct interview together data, categorize information, create a database using MySQL and testing of the system. The requirements of this system include documentation of technical information, present repository so that technical info can be read online, capture and reuse knowledge and online FAQ. The implementation tool used were Linux operating system (Red Hat 8.0), Apache web browser, MySQL database, PHP my admin 2.0.1 and the programming language was done in PHP scripting language, to design the database normalization method is applied.

M Somantri, A Djohar, A G Abdullah1, A Juhana1, and S Aryadi, Implementation of sharing knowledge in internship program using a web-based information system, 2018. The aim of this study is to develop a useful information system in industry practices to facilitate knowledge sharing. The system helps both students and supervisor in the process of internship program activities. The system was implemented using a website technology consisting of four main components which are students, teachers, supervisors and supervising industry. Features of this system includes schedules, registration, portfolio report, news internship, guidance and online chat. For the research methodology, Design Research Method is used and this method consists of a six-step process which are asking a question, researching existing sources, formulating hypothesis, designing and conducting a study, drawing conclusion and reporting results. The

implementation tool used for the system includes PHP, CSS, HTML JavaScript, MySQL database and the Apache web server technology. To design the database a Dataflow diagram is used (DFD), the DFD used consists of three levels which are level 0-2.

Jinyue Peng, Dongxing Jiang, Xinyu Zhang, Design and implement a knowledge management system to support web-based learning in higher education, 2016. The aim of this study is to design and implement a knowledge sharing platform to support knowledge services for Tsinghua Web School. The system uses a four-layer structure to represent the system these include service layer, web-based learning platform layer, knowledge management service layer and infrastructure service layer. The recommendation of this system for further research include developing a sharing system with more intelligence and personalization.

Kate Molete, Olumuyiwa J. Dehinbo, and Kehinde O. Dehinbo, An Innovative Knowledge Sharing System for Collaboration in the Public Sector: The Case of a South African Government Department, 2015. The aim of this study is to develop a collaborative environment of capture and share meaningful knowledge within the south African government in an effective and efficient manner. The research methodology used is prototyping which involves the process of System development life cycle (SDLC), It is an iterative process that is part of the SDLC. To implement the system, PHP my admin is used as the major programming language and MySQL database is used to store the database of the system.

George Suckarieh, Annu Prabhakar, Tim Walker, Implementing a Web-Based Knowledge sharing system for a construction company: Industry-Academia Collaboration, 2015. This paper aims at implementing a web-based knowledge sharing system to assist a company transfer construction knowledge from an experienced professional in the field to a newly hired professional. This paper explains the process of developing, designing, conceptualizing, testing and implementing the web-based Knowledge sharing system. To implement the system, Active Server Pages (ASP) was used for server-side (back-end) programming and JavaScript for client-side (front-end) programming, Microsoft Windows platform, Microsoft Visual Basic 6 as the

development environment, Microsoft SQL Server 2000 Standard Edition was used as the database server and makes use of Microsoft's Full-Text Indexing which allows all documents stored in the database to be indexed and searchable. the system also makes use of a 3tier architecture to design the web-based system.

2.4.1 REVIEW OF ONLINE KNOWLEDGE SHARING EXISTING SYSTEMS

2.4.1.1 QUORA

Quora is one of the best knowledge sharing systems we have today, Quora works both as a web and mobile application. It is a question and answer website where questions are asked, answered, edited, and organized by its community of users in the form of opinions. Users can work together by editing questions and proposing edits to answers that have been submitted by other users. Figure 2.2 shows the display interface for Quora.
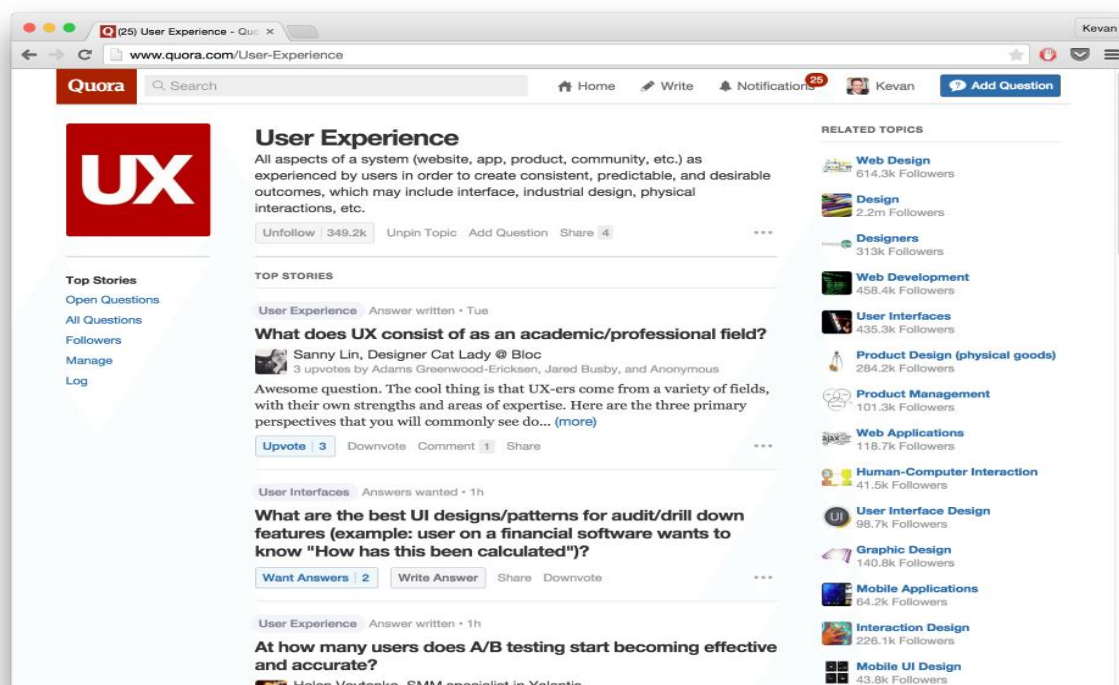
Figure 2.2 Image displaying Quora

17

(source: buffer.com)

Some features of the application that helps increase its productivity are:

i. Quora inbox which shows the list of activities from individuals who are following your progress.

ii. Adding answers to questions, this gives users the ability to add an answer to the question asked and improves the development of the specific content.

iii. Sharing questions and answers among a social media community.

iv. Quora profile which allows users to access the user's personal profile.

v. Quora home gives users the ability to see updates top answered questions and ranked questions as users browse the site.

2.5.2 BOOST HQ

BoostHQ is a standout popular web application and mobile application for users to create content, share links, files and thoughts on various topics. It also enables exchange of information among team members and also allows for real time discussions. What is great about BoostHQ is that everything team members share is automatically indexed in topic specific channels and they can access it exactly when they want it. Figure 2.3 shows the display interface for BoostHQ.
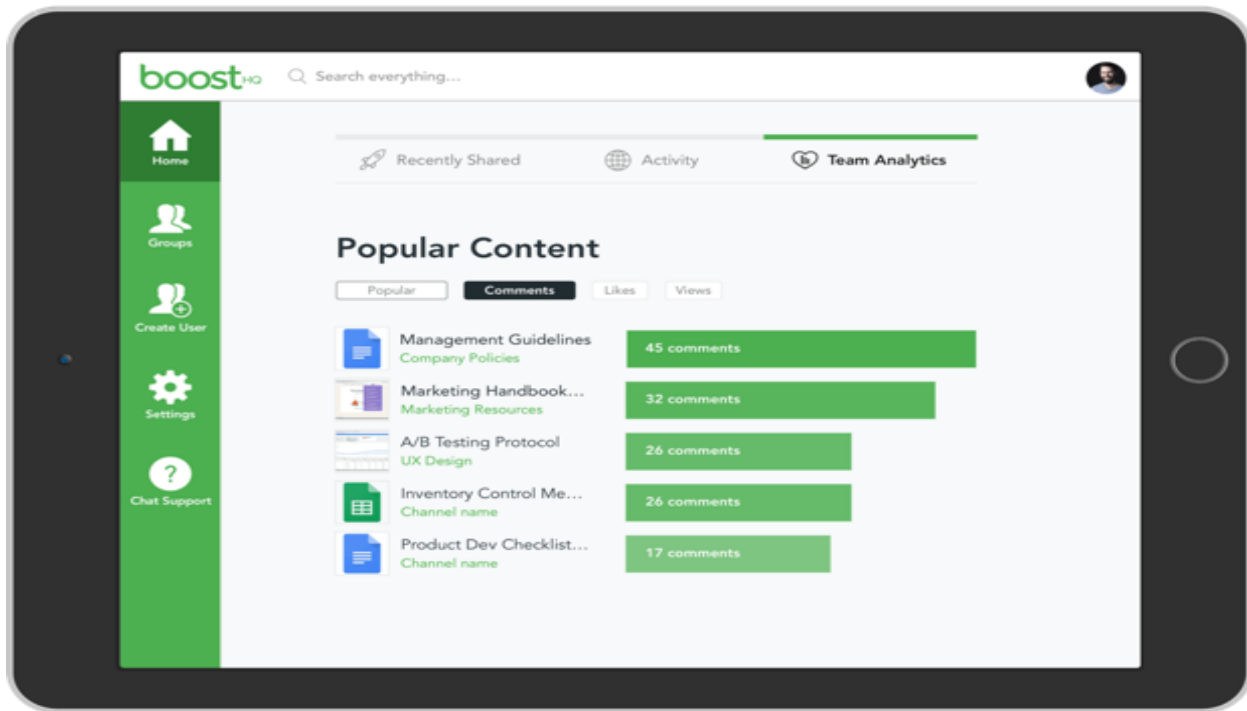
Figure 2.3 Image displaying BoostHQ

(Source: chanty.com)

BoostHQ Features

i. File sharing: BoostHQ allows users to easily share content whether its links, videos, documents or other useful materials. Users can easily share learning contents such as job aids, procedural guidelines or tutorials.

ii. Smart search: smart search feature ensures users have access to whatever information they need.

iii. Social engagement: allows employees to contribute feedbacks, ideas and questions. It also increases employee engagements with the content being shared.

iv. Push notifications

v. Gamification: up voting feature encourages employees to participate and improve their involvement.

2.5.3 ZOHO

Zoho is a very easy and simple way to put all your information available to be shared into one searchable portal. It is mostly efficient for organizations with employees scattered across different geographical areas as they find it very useful and it takes less technical knowledge to operate. Figure 2.4 Shows the display interface for zoho
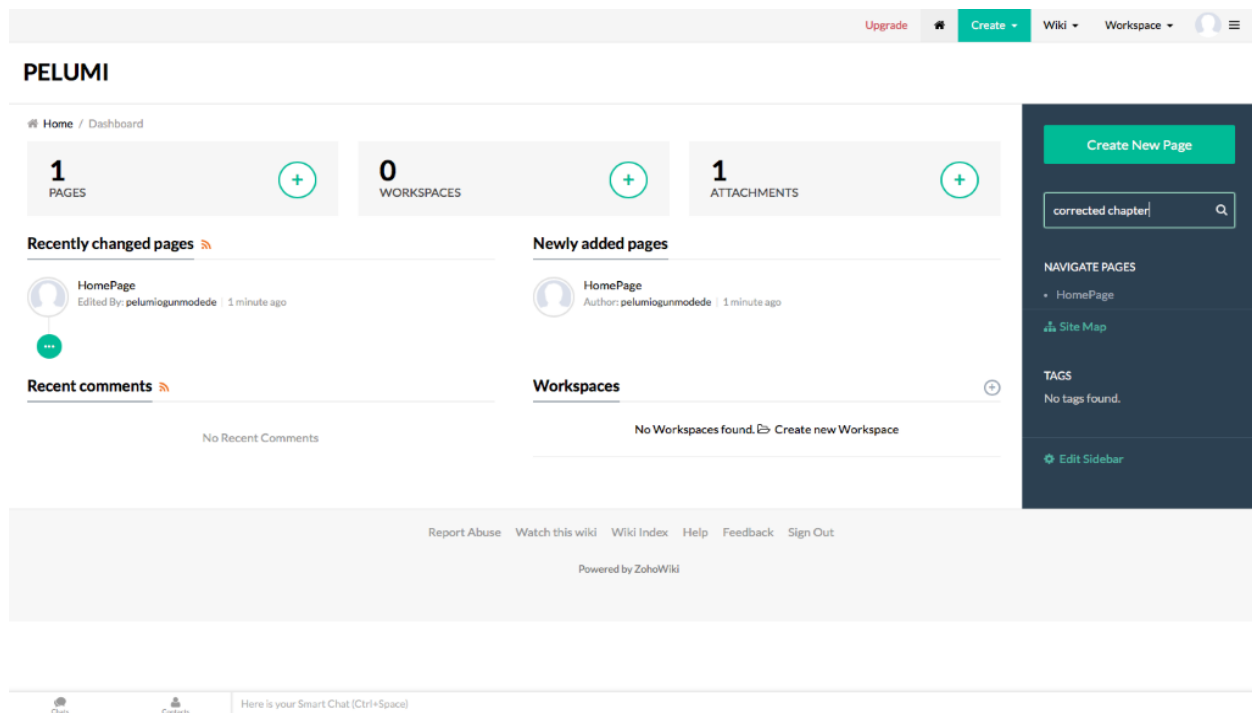
Figure 2.4 image displaying zoho

(source: pelumi.wiki.zoho.com)

Features of Zoho

i.   Content management: Zoho allows users to organize their workspace by creating pages and subpages for different topics. It also has an effective mechanism that allows users to search content within Zoho. The searches are conducted based on page and file names.

ii. Workspace: allows users to create their own workspaces in which they can share knowledge.

iii. User administration: this feature allows users to give access permissions to other users to view their contents. Users can also decide which content they want to be shared.

iv. Notifications: this feature allows users to get updates and notify users when changes are made or comments are added to the user's page.

2.5.4 STACK OVERFLOW

Stack Overflow is the largest online community in which developers can learn, share their knowledge and build their careers. Stack Overflow partners with companies to help them understand, hire, engage, and enable developers around the world. Stack overflow focuses on enterprise knowledge sharing, developer marketing, technical recruiting, market research and developer marketing. Figure 2.5 Shows the display interface for Stack Overflow.

Figure 2.5 image displaying Stack Overflow

(Source: meta.stackexchange.com)

Features of Stack Overflow

i. Simplicity: Stack Overflow makes use of a very easy process of registration in which users can use his/her existing Facebook or google account to sign up on the website. Simplicity of systems is very important in knowledge sharing systems so as to enable the users navigate through the system easily.

ii. Objective question and answering: Stack Overflow use an expert question and answer system to give intelligent ways of problem solving to users. It also alerts the user right when he or she starts typing the question to the advice.

iii. Gamification: Stack Overflow uses gamification to measure how much the system trusts the user, the higher a user reputation, the more privileges the user has to the system.

2.6 FEATURES OF AN ONLINE KNOWLEGDE SHARING SYSTEM

There are some common features of a knowledge sharing system, these features should be present in all others, and they are discussed below. These features may not be available in every single knowledge sharing system but they are features for a standard system for knowledge sharing.

2.6.1 Search Engine

Search engine is one of the most important features for any knowledge sharing system. A knowledge base is a separate entity that must have a separate engine similar to those that web browsers comprise of. This is necessary because of the fact that knowledge bases are usually large.

It has been noticed that with time, they only get bigger and bigger because businesses update them with new information important for the purpose of keeping their customers informed. In a knowledge repository, finding the right article isn't easy and can be difficult.

This is why a search engine is important. With the implementation of a good search engine, keywords, and tags, knowledge base users will be able to search what they are looking for and find it quickly and easily.

2.6.2 Ease of use

A knowledge sharing software needs to be simple in every possible way, except the amount of valuable information it holds. It should be easy to implement, set up and access. A business organization needs to update its knowledge base and add new information regularly to keep it up to date and relevant. This means that it should have simple operations that allow users to do this without any complications and, more importantly, very quickly.

2.6.3 Accessibility

The knowledge sharing system cannot be limiting in any way. Any user who wants to access it should be able to do so. The biggest problem businesses faced in the past was that their knowledge bases were built simply and optimized only for certain web browsers, which caused a lot of damage.

2.6.4 Option to comment

Apart from having a lot of articles and other forms of documents that can be helpful to users, the system should also allow users to share their feedback and discuss important topics. A good knowledge sharing system which is well written, offering relevant data to the users can actually help find solutions to problems and has the ability to create a whole community around it.

2.6.5 Notification

With the old method of using papers, there was no notification, but with digital power, there is a lot that can be done, one of which is notification A notification can be a simple pop up and beep that notifies the user of when changes are made, this helps the user to keep track of activities on the system.

2.7 ISSUES WITH ONLINE KNOWLEDGE SHARING SYSTEMS

As with most systems there are shortcomings, knowledge sharing systems are no exception.

2.7.1 Security

Accommodating the right level of security for knowledge management is key. Conscious information should be shielded from most users, while allowing easy access to those with the proper credentials.

2.7.2 Getting People Motivated

Overpowering organizational culture challenges and developing a culture that embraces learning, sharing, changing, improving can't be done with technology.

2.7.3 Keeping Up with Technology

Regulating how knowledge should be dispensed, transferring it quickly, and effectively is a huge challenge. Constantly changing structures mean learning how to be smart, quick, agile and responsive − all things a knowledge sharing system must be able to finish.

2.7.4 Measuring Knowledge

Knowledge is not something that can be easily quantified, and is far more complex because it is copied out of human relationships and experience. The focus should be on distributed purpose rather than results or efforts.

CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN

3.1 INTRODUCTION

The system analysis phase involves the design and methodology that is being put in place in the building of the online knowledge sharing system. This chapter goes further to explain the system analysis phase which involves describing the requirements analysis, functional and nonfunctional requirements of the system. It also explains the system design phase which also involves the system architecture used for the online knowledge sharing system, the different models used to model the system. Some of the model used in this chapter are use case diagrams for both the user and administrator, the sequence diagram for both the user and administrator, the class diagram and finally the activity diagram. These models are used to provide a detailed description of the system design phase in the online knowledge sharing system. After this phase the database description follows, this explains the contents of the database made for the proposed system and how they interact with each other.

3.2 SYSTEM ANALYSIS

System analysis for the online knowledge sharing system involves the description of the requirements analysis which consists of the functional and nonfunctional requirements of the system. This involves understanding the important data need for the flow of information, this phase ensures critical thinking and divides the system into segment pieces to know how well these parts functions in achieving the main aim of the proposed system. The functional and nonfunctional requirements of the online knowledge sharing system are further explained under requirement analysis.

3.2.1 Requirements Analysis

Requirements analysis for this proposed system involves description and detailed set of requirements needed for the system. Software requirements are divided into two parts

I)   Functional Requirements

II)   Non- Functional Requirements

3.2.1.1 Functional Requirements

The functional requirements of the online knowledge sharing system explains what the system should be able to do, the services in which the system should provide and the behavior of the system in certain circumstances.

The functional requirements for the online knowledge sharing system includes:

i.   The system should provide a signup and login capability.

ii.   The user shall be able to search and find posts.

iii.   The user shall be able to download, save and view posts.

iv.   The user shall be able to invite other users.

v.   The user shall be able to upload posts.

vi.   The user shall be able to view personal profile and another user profile.

vii.   The system shall be able to provide a messaging platform for communication.

viii.   The user shall be able to comment on posts uploaded.

ix.   The system shall be able to notify users on actions carried out.

x.   The user shall be able to send broadcast messages.

xi.   The system shall be able to rank the users based on votes on posts.

3.2.1.2 Non-Functional Requirements

A non - functional requirement of the online knowledge sharing system requirement sets out criteria that can be used to decide a system's operation rather than particular behaviors. They contrast with functional requirements defining specific behaviors or functions. The Non-Functional requirement for the online knowledge sharing system includes:

i.   Usability requirements: the system being an online web application should be simple and easy for the user to navigate through the system and enable the users interact easily with the system.

ii. Reliability requirement: the system should be able to deal with the requirements of the users and in the occurrence of failure of the system, the data should not be lost.

iii. Maintainability requirements: the system proposed should provide maintenance when the need arises.

iv. Response time: this refers to the amount of time the system uses to respond to a specific task. The task should not be time consuming and should not bore the user.

3.3 SYSTEM DESIGN

The system design for the online knowledge sharing system involves the use of some visual modelling representation of the system, the system design is primarily intended to give a visual demonstration of how the application and system works and how each service functions in the light of changing user inquires and activities. In light of this, to design and model the online knowledge sharing accurately the system architecture and some unified modelling language was used to explain the system design process.

The system architecture used for the system is the 3-tier architecture which involves the first level which is where the client is being able to interact with the system, the second level which involves connection between the client and the database and finally the third level which involves the database which is used to store and access the information from the system.

The Unified modelling language used in modelling the online knowledge sharing system are; use case diagram, the class diagram, the activity diagram and the sequence diagram.

The use case diagram for the online knowledge sharing system explains diagrammatically the interactions between the user and the system. For the modelling of the system two use case diagrams were used. First the user use case diagram which explains the interaction between the user and the system and secondly the administrator use-case diagram that explains the interactions between the administrator and system.

The class diagram for the online knowledge sharing system explains the relationships between the system classes, attributes and methods that are used in the system. This is done by identifying the cardinality between the different classes in the system.

The sequence diagram for the online knowledge sharing system explains the interactions among the objects in a sequential order (I.e. in the order in which the interactions are carried out). For this system, two sequence diagrams were being used. The first explains the interactions between the User, WebApp and Database and the flow of activities between them. The second sequence diagram explains the interactions between the Administrator, Webapp and Database as well as the flow the flow of activities between them.

The activity diagram for the online knowledge sharing system displays the activities engaged with the usage of the system. two activity diagrams were used for this system, the first activity diagram explains the activities of the user from the signup or login to the logout section of the system and the second activity diagram explains the administrator's activities from the login to the logout section.

3.3.1 SYSTEM ARCHITECTURE

Systems Architecture for the online knowledge sharing systemis a theoretical model that characterizes the structure, behavior and views of a system. It is a formal depiction and representation of a framework organized in a manner that supports the system's structures and behavior.

There are various types of system architecture that can be used as part of a web application's development process, some of which are 2-tier system architecture, n-tier system architecture consisting of a minimum of 3 layers and 3-tier system architecture.

A 3-tier architecture is used for modelling the online knowledge sharing system. Figure 3.1 shows the 3-tier architecture consists of; First Level (Client tier), Second Level (Application tier) and Third Level (Database tier).

3.3.1.1 First Level (Client Tier)

The client tier uses a web browser to receive and send request between the user and web server by using the Hyper Text Transfer Protocol (HTTP). The client makes requests to the server and the server processes the requests and returns a response back to the client, some of the web browsers that can be used includes; Apple Safari, Google Chrome, Mozilla Firefox.

3.3.1.2 Second Level (Application tier)

The application tier level acts as a mediator between the client tier and the database tier by receiving requests and inputs from the user through the client level, while accepting and sending data via a server. Thus, being able to access and control information in the client level on the database while sending data back to the user on the client level so as to be viewed. The application tier is also called Business Logic layer of the system. some languages used in programming the application tier includes Java, Python, Ruby on Rails, C#, PHP.

3.3.1.3 Third Level (Database tier)

The database tier acts as an information storage facility or store room that a fully functional web application requires. It is used to store, access and recover/ retrieve whatever information the client and server level requires. It also makes usefulness of dynamic web pages by distributing the information the system requires to perform various actions. The Figure 3.1 illustrates these 3 levels.
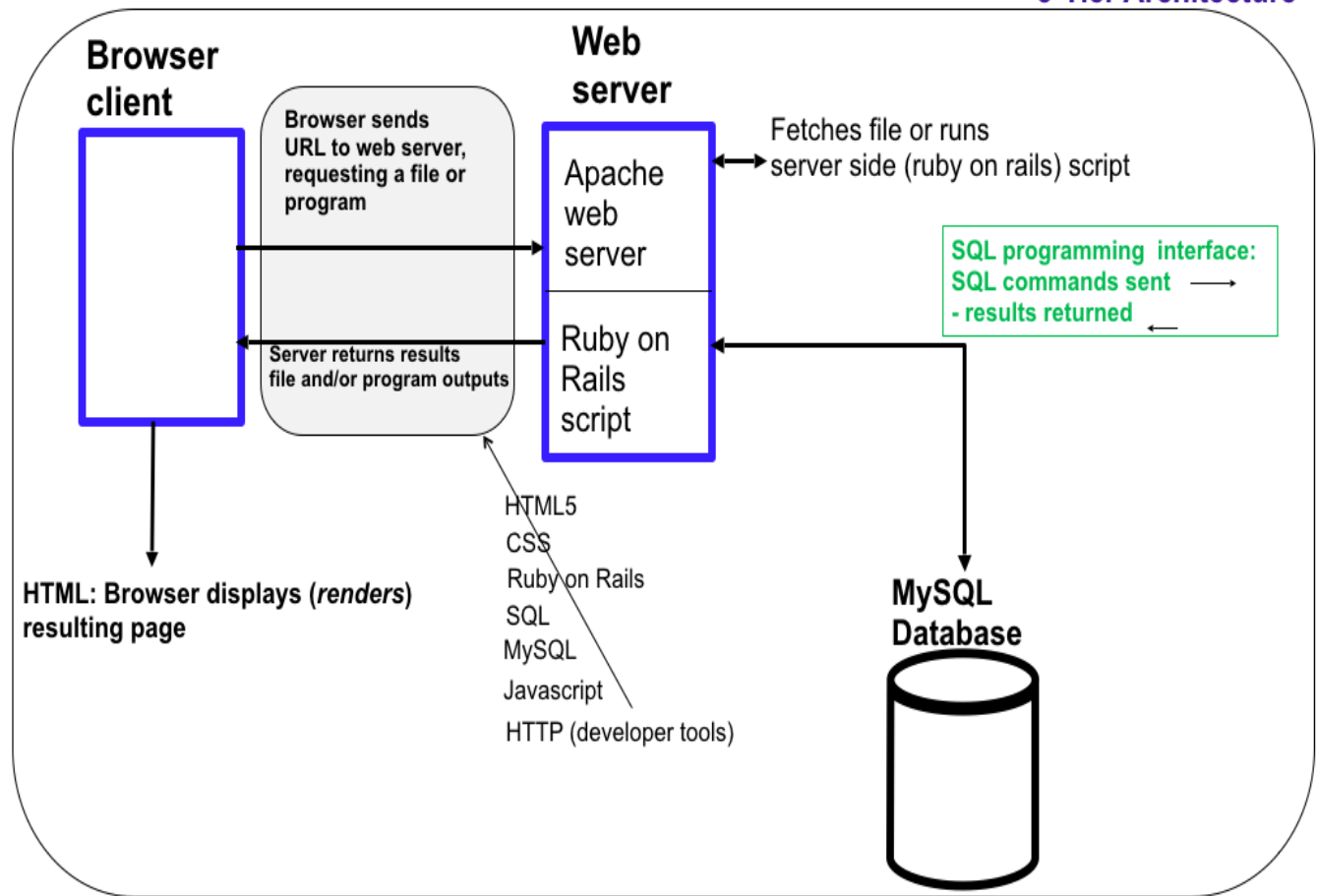
3-Tier Architecture

Browser client

Web server

Browser sends URL to web server, requesting a file or program

Apache web server

Fetches file or runs server side (ruby on rails) script

Ruby on Rails script

SQL programming interface:
SQL commands sent ⟶
- results returned ⟵

Server returns results file and/or program outputs

HTML: Browser displays (*renders*) resulting page

HTML5
CSS
Ruby on Rails
SQL
MySQL
Javascript
HTTP (developer tools)

MySQL Database

Figure 3.1 System Architecture for online knowledge sharing system.

(source: tutorialspoint.com)

3.3.2 Use Case Diagram

The use case diagram for the online knowledge sharing system explains the interactions between the user and the system and between the administrator.

Figure 3.2 shows the relationship between the actor which is the user and now the user interacts with the system by using use cases and how they are able to perform it functions which are;

30

i. Signup: the client or user of the system is proposed to register to the system by providing necessary details which are stored in the database of the system. After the signup has been completed the user tries to login with his details thus providing access into the system.

ii. login: the client or user of the system can login to the signed-up account to access his/her profile or create another login detail if he doesn't have an active account.

iii. Manage post: the user or client is allowed to manage the document uploaded to the system. The user can either add, edit or delete the post he/she uploaded.

iv. Download post: A client should be able to download post from the system into their personal devices.

v. Manage comments: every client of the system is allowed to add, edit or delete their comments on a post.

vi. Upload post: the users of the proposed system are allowed to put up relevant post of their choice to the system for other users to view and download.

vii. Search posts: the users of the proposed system can easily search to find posts.

viii. View profile: Every client of the system has a unique profile in which they and edit and change to their wish and also view their profile whenever they want.

ix. Invite user: the users of the system can send out invite to other people to introduce them to the application.

x. logout: when the user is done with the system or found what he /she is looking for, the system provides a logout capacity to end the session for that specific user.

USER SUBSYSTEM

Signup

Login

Manage Post

Download Post

Manage Comments

Upload Post

Search Post

View Profile

invite user

Log Off

Add

Edit

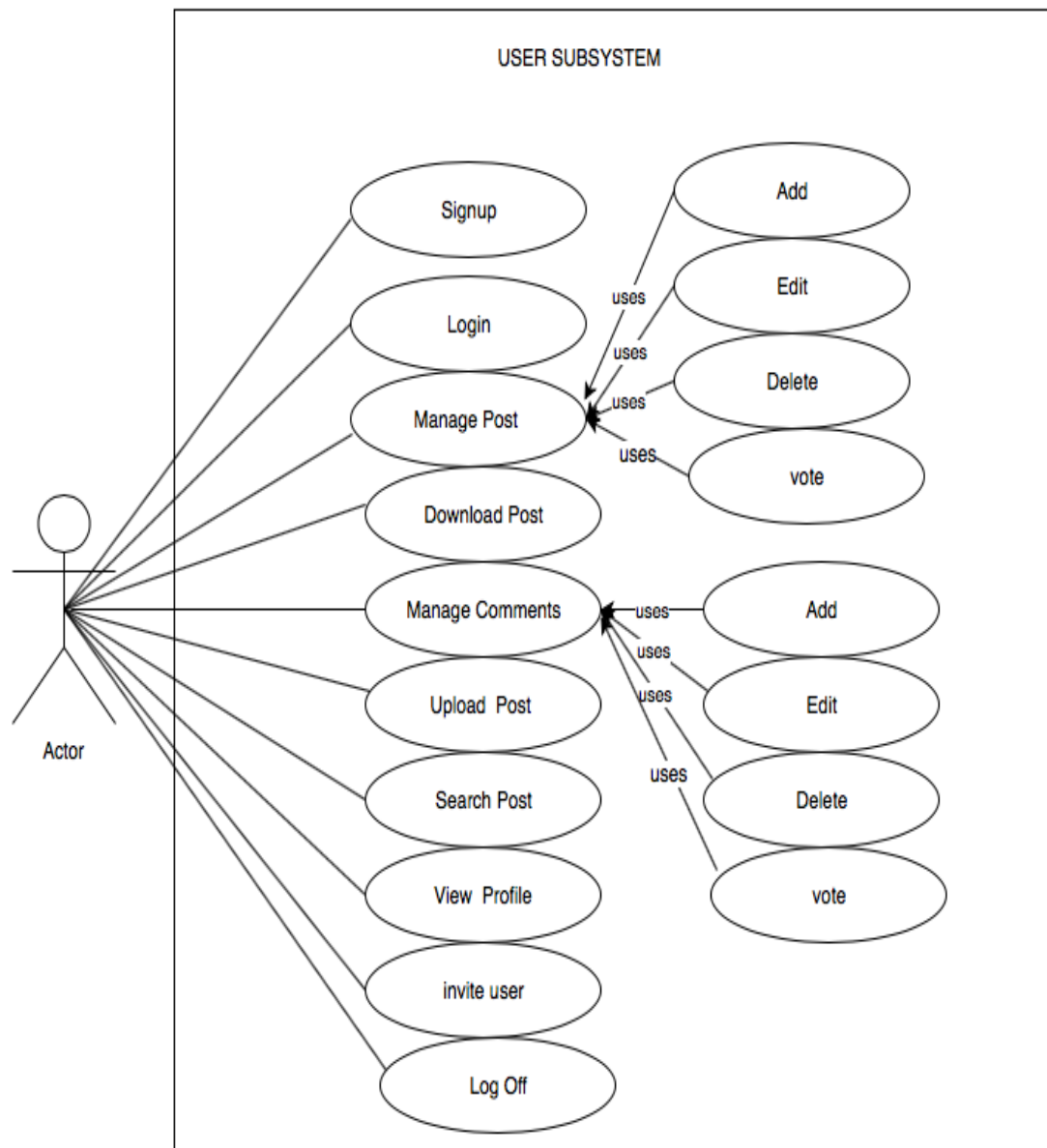Delete

vote

Add

Edit

Delete

vote

uses

Actor

Figure 3.2 use case diagram for user subsystem of the online knowledge sharing system

Figure 3.3 shows the relationship between the administrator and the system, the use cases of this include;

i.   Login: The administrator is the controller of the system, has the ability to login to the backend of the system to view the activities taking place on the system.

ii.   Manage documents: the administrator being the controller of the system can view the documents being uploaded by the various users view the number of downloads on a document.

iii.   Manage users: the administrator has the ability to view users from his/her dashboard and easily view their activities on the system.

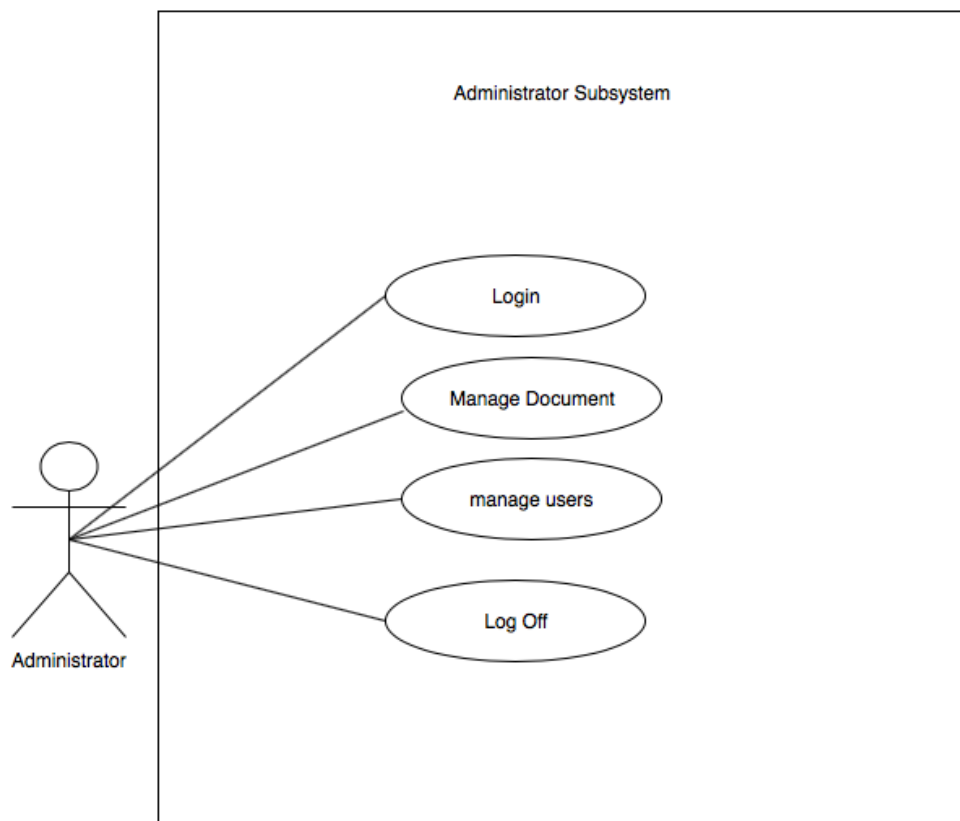iv.   logout: the administrator also has that capability to log out of the system at the end of a session.

Figure 3.3 use case diagram for administrator subsystem of the knowledge sharing system

3.3.3 The Class Diagram

33

The class diagram for an online knowledge sharing system explains the representation of the systems classes, relationships, attributes and operations that exist among them.

The class diagram in Figure 3.4 is a diagrammatic representation of the relationships between the classes within the system's program, the graphical representation comprises of attributes and their relationship existing between them. The numbers in Figure 3.4 represent a sort of cardinality existing among the subclass and the superclass. Some of the relationship present in Figure 3.4 include: one-to-many (1: N) relationship and one-to-one (1:1) relationship.

3.3.3.1 Classes and Their Relationships

i. User and administrator: each user in the class diagram may not have more than one administrator and not less than one administrator. The administrator of the system may have one or many users to manage. The administrator also has a generalization relationship with the user, since the administrator is also a user but with higher access permissions and access to view the entire system, the administrator is therefore a subclass of the user.

ii. User and Document: each user/client can have one to many documents on his/her profile also, a single document can be posted by one and only one user.

iii. Comment and user: Each comment on the system can only be posted by one and only one user and also the user can post one-to-many comments on the system.

iv. User and Ranking: here, the ranking by the system can accommodate one-to-many users and only one ranking to a user.

v. Messages and User: a user can send one or many messages and only or many message can belong to a user

vi. Administrator and Ranking: The administrator can view one or more ranking of the users on the system while the ranking can be viewed by just one and only one administrator.

3.3.3.2 States in the Class Diagram

i. User state: In this system there exists one state which is the user state it refers to the various states and status of the users in the system. They consist of the new users and the active users of the system.
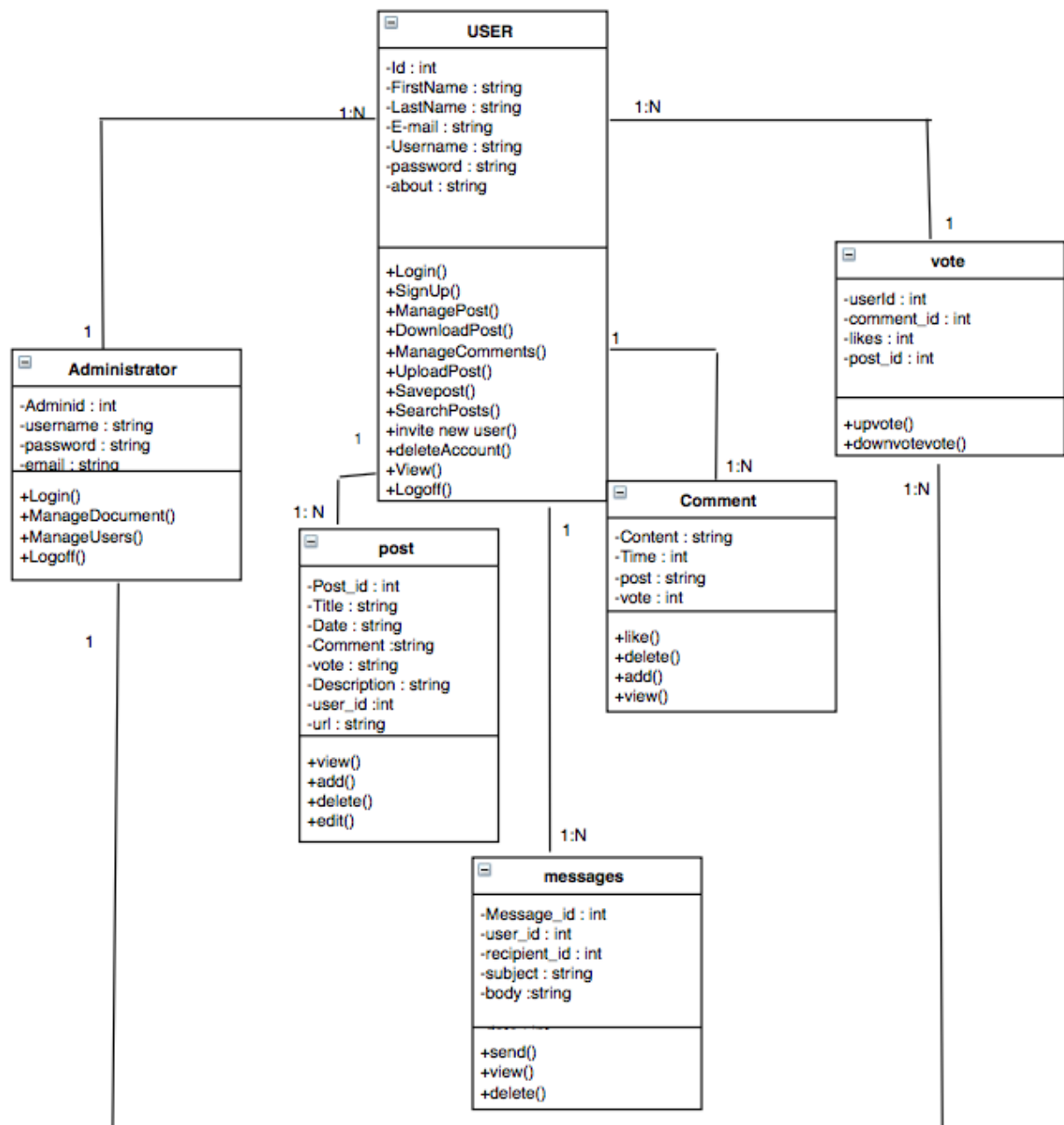
USER

-Id : int
-FirstName : string
-LastName : string
-E-mail : string
-Username : string
-password : string
-about : string

+Login()
+SignUp()
+ManagePost()
+DownloadPost()
+ManageComments()
+UploadPost()
+Savepost()
+SearchPosts()
+invite new user()
+deleteAccount()
+View()
+Logoff()

Administrator

-Adminid : int
-username : string
-password : string
-email : string

+Login()
+ManageDocument()
+ManageUsers()
+Logoff()

vote

-userId : int
-comment_id : int
-likes : int
-post_id : int

+upvote()
+downvotevote()

post

-Post_id : int
-Title : string
-Date : string
-Comment :string
-vote : string
-Description : string
-user_id :int
-url : string

+view()
+add()
+delete()
+edit()

Comment

-Content : string
-Time : int
-post : string
-vote : int

+like()
+delete()
+add()
+view()

messages

-Message_id : int
-user_id : int
-recipient_id : int
-subject : string
-body :string

+send()
+view()
+delete()

1:N   1:N   1   1:N   1   1:N   1:N   1   1: N   1   1:N

Figure 3.4 class diagram for online knowledge sharing system.

35

3.3.4 Sequence Diagram

Sequence diagram for the online knowledge sharing system shows the interactions among objects in a sequential order. Sequence diagram explains the messages in form of request that passes progressively inside a system. The sequence diagram used in this proposed system will consists of processes, objects and messages traversing over each stage.

Figure 3.5 shows the object present in the diagram, this object refers to the actor which is the user, the webapp which would be broken down into a series of ways in which the user can view the services present in the system and in the database.

The arrows in the diagram indicates where and when the replies to messages being called are passed. And to what object it is being passed to. The dotted lines directly underneath the objects illustrates the lifelines of these objects and to what extent they exist during the duration of the system.

The user sequence diagram in Figure 3.5 illustrates the arrangement of activities that the customer performs. Some of these activities includes uploading a document/file, searching document/file, downloading document/file, viewing profiles and commenting.
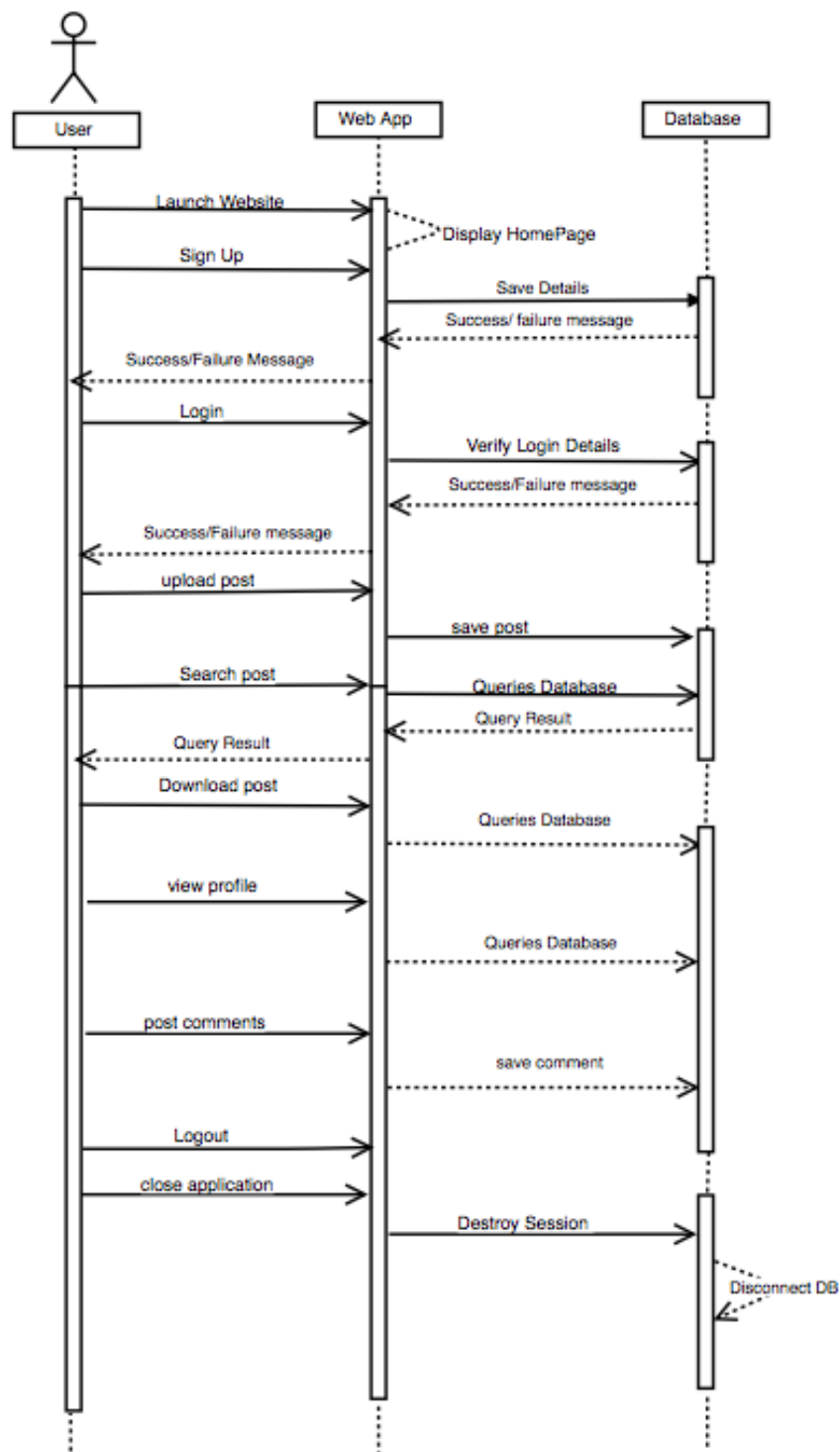
Figure 3.5 sequence diagram for online knowledge sharing system (user).

The administrator sequence diagram in Figure 3.6 illustrates the management of the activities the administrator can perform. These activities include: viewing documents/files and viewing the users of the system.
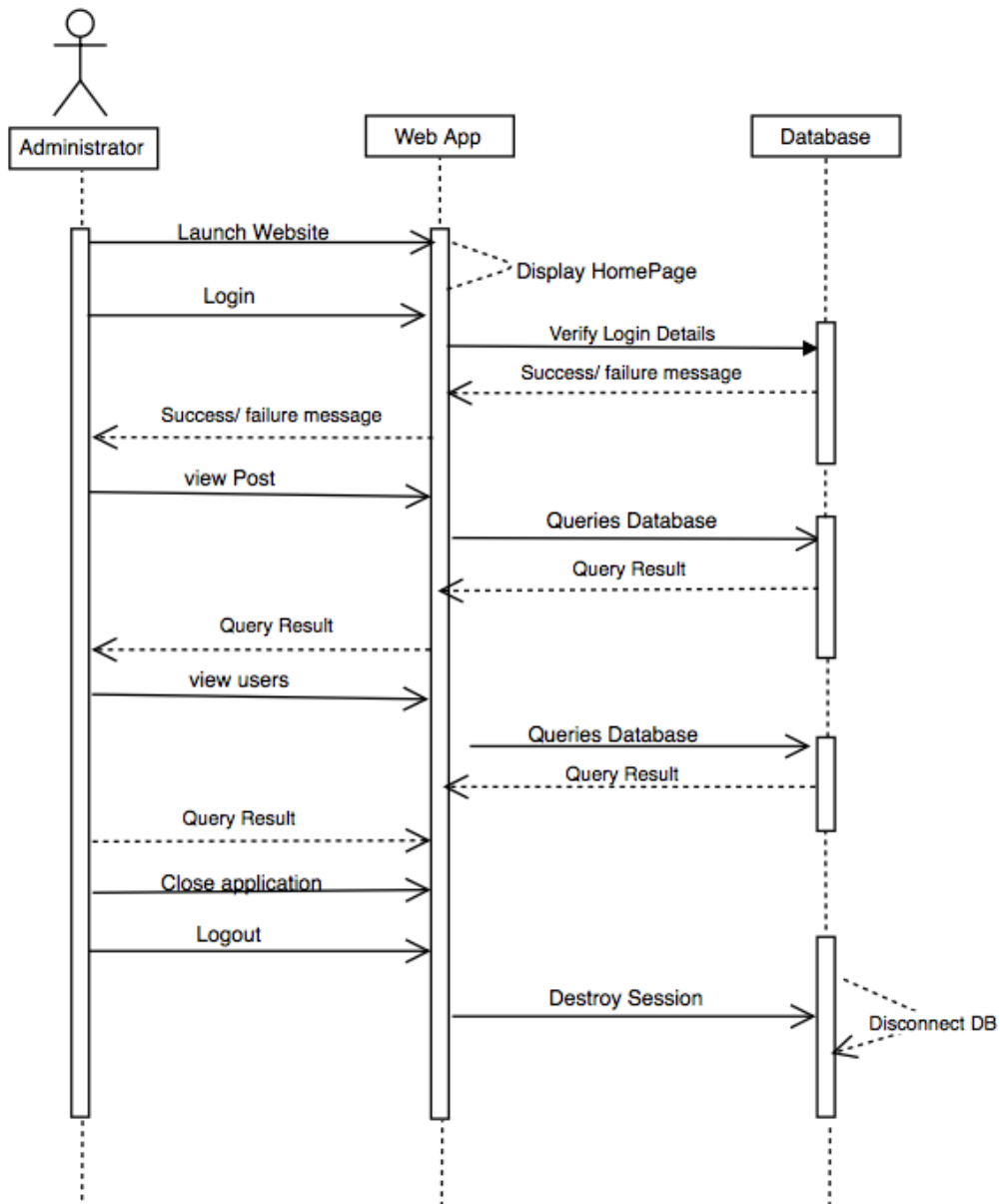

Figure 3.6 sequence diagram for online knowledge sharing system (Administrator)

3.3.5 Activity Diagram

The activity diagram for the online knowledge sharing system represents of the flow of activities that take place in the system. It consists of rectangles that describe the activities, diamond that describes the decisions made, a dark colored circle indicating the first state or the start state and also the end states. The arrows portray the movement of the flow of activates.

Figure 3.7 shows the activity diagram for the user. It portrays a visual representation of the activities and tasks sequentially, from one action to another during the execution of the application.

The activity diagram in Figure 3.7 portrays a system that begins by the users visiting the homepage in which they can sign up if they don't have an existing account or login. After the signup and login, the system allows the user to proceed to the main parts of the system in other to view and interact with the system and eventually logout.
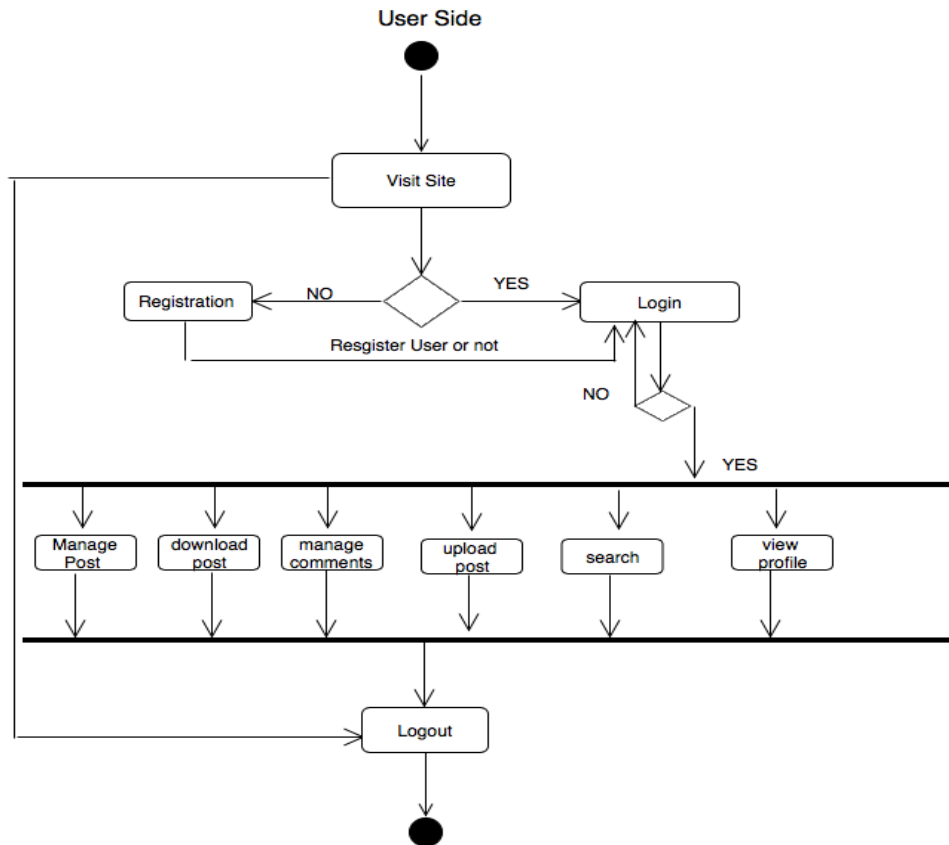
Figure 3.7 Activity diagram for online knowledge sharing system (User)

The activity diagram in Figure 3.8 shows the administrator activity diagram as they interact with the system. It beings with the login then proceeds to a dashboard where they can carry out some activates and have an overall view of the system and also eventually logout.
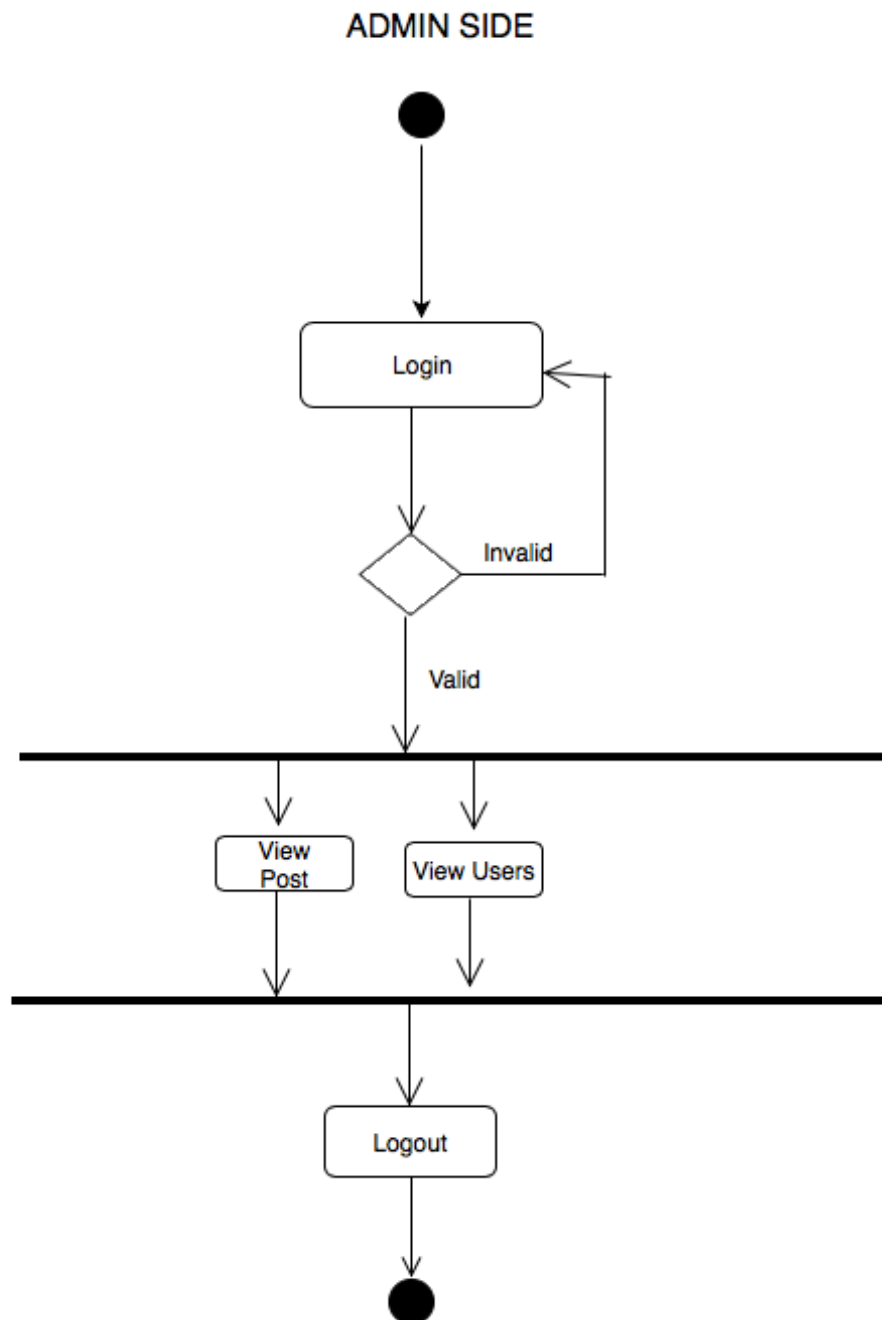
ADMIN SIDE

Figure 3.8 Activity diagram for online knowledge sharing system (Administrator)

3.4 DATABASE DESIGN AND DESCRIPTION

The online knowledge sharing system database design consists of some tables that are described in the sections bellow, the name of the main MySQL database of the application is lobsters_dev.db.

3.4.1 Description of tables

Some of the tables present in my database are:

3.4.1.1 User Table:

The users table is a table that stores the details of each user in the database, it comprises of the registration and login details of each user.

Table 3.1 User Table

ATTRIBUTE	Description	Datatype	KEY
Id	Serial number of the user	Int	PRIMARY
Firstname	First name of the user	Varchar	
Lastname	Last name of the user	Varchar	
Email	Email address of the user	Varchar	
Username	Unique login name of user	Varchar	
Password	Unique password of user	Varchar	
AdminId	Serial number of administrator user	Varchar	FOREGIN
Date	Date in which account was created	Int	
About	Personal user description	Varchar	

3.4.1.2 Post Table:

This table comprises of the details of each post made by a user in the system.

Table 3.2 Post Table

42

ATTRIBUTE	Description	Datatype	KEY
Id	Serial nuber of post	Int	PRIMARY
Date	Date in which post was made	Int	
User_id	Serial number of the user	varchar	FOREGIN
url	Url link to a post	Varchar	
title	The title of a post made	Varchar	
Description	Details of the content of post	Varchar	
Upvotes	Increase in likes on a post	Int	
Downvotes	Decrease in likes on a post	Int	
Attachment	Pdf, text and files that are uploaded on the system	varchar	

3.4.1.3 Message Table:

This table contains information about the various messages sent from one user to another in the system.

Table 3.3 Message Table

ATTRIBUTE	Description	Datatype	KEY
Id	Serial number of message	Int	PRIMARY
Date	Date in which message was sent	Int	
User_id	Serial number of user	Int	FOREGIN
Recipient_id	Serial number of recipient	Int	FOREGIN
Subject	Title of the message sent	varchar	
body	Content to the message sent	varchar	

3.4.1.4 Comments Table:

This table contains the various comments posted by users of the system.

Table 3.4 Comments Table

ATTRIBUTE	Description	Datatype	KEY
Id	Serial number of comment	Int	PRIMARY
Date	Date in which comment was posted	Int	
Updated_at	Date in which comment was updated	Int	
Post_id	Serial number of post	Int	FOREGIN
User_id	Serial number of user	Int	FOREGIN
Comment	Content of comment posted	Varchar	
Votes	Number of likes on a comment	Int	
downvotes	Decrease in likes on a comment	Int	
subcomment	Comments made under another comment	Varchar	

3.4.2.5 Votes Table:

This table consists of the votes made by the users in the system

Table 3.5 Votes Table

ATTRIBUTE	Description	Datatype	KEY
Id	Serial number of vote	Int	PRIMARY
User_id	Serial number of user	Int	FOREGIN
Post_id	Serial number of post	Int	FOREGIN

44

Comment_id	Serial number of comment	Int	FOREGIN
Vote	Number of likes on a comment	Int	
Date	Date in which vote was made	Int	

3.4.2.6 Invite user Table:

This table comprises of the invites sent out by users to introduce new users to the system.

Table 3.6 Invite user Table

ATTRIBUTE	Description	Datatype	KEY
Id	Serial number of invite	Int	PRIMARY
User_id	Serial number of user	Int	FOREGIN
Email	Email address of invitee	Varchar	
Date	Date invite was sent	Int	
Description	Body of the invite sent	Varchar	

3.4.2.7 Saved Posts Table:

This table contains posts in the database that have been saved

Table 3.7 saved post table

ATTRIBUTE	Description	Datatype	KEY
Id	Serial number of saved post	Int	PRIMARY
date	Date post was saved	Int	
Updated_at	Date saved post was updated	Int	
User_id	Serial number of user	Int	FOREGIN
Post_id	Serial number of post	Int	FOREGIN

3.5 ENTITY RELATIONSHIP DIAGRAM

45

Entity relationship diagram for this system shows the graphical representation of the tables in the lobsters_dev database and their relationship with eachother. Figure 3.9 shows the attribute as well entities and their relationship.
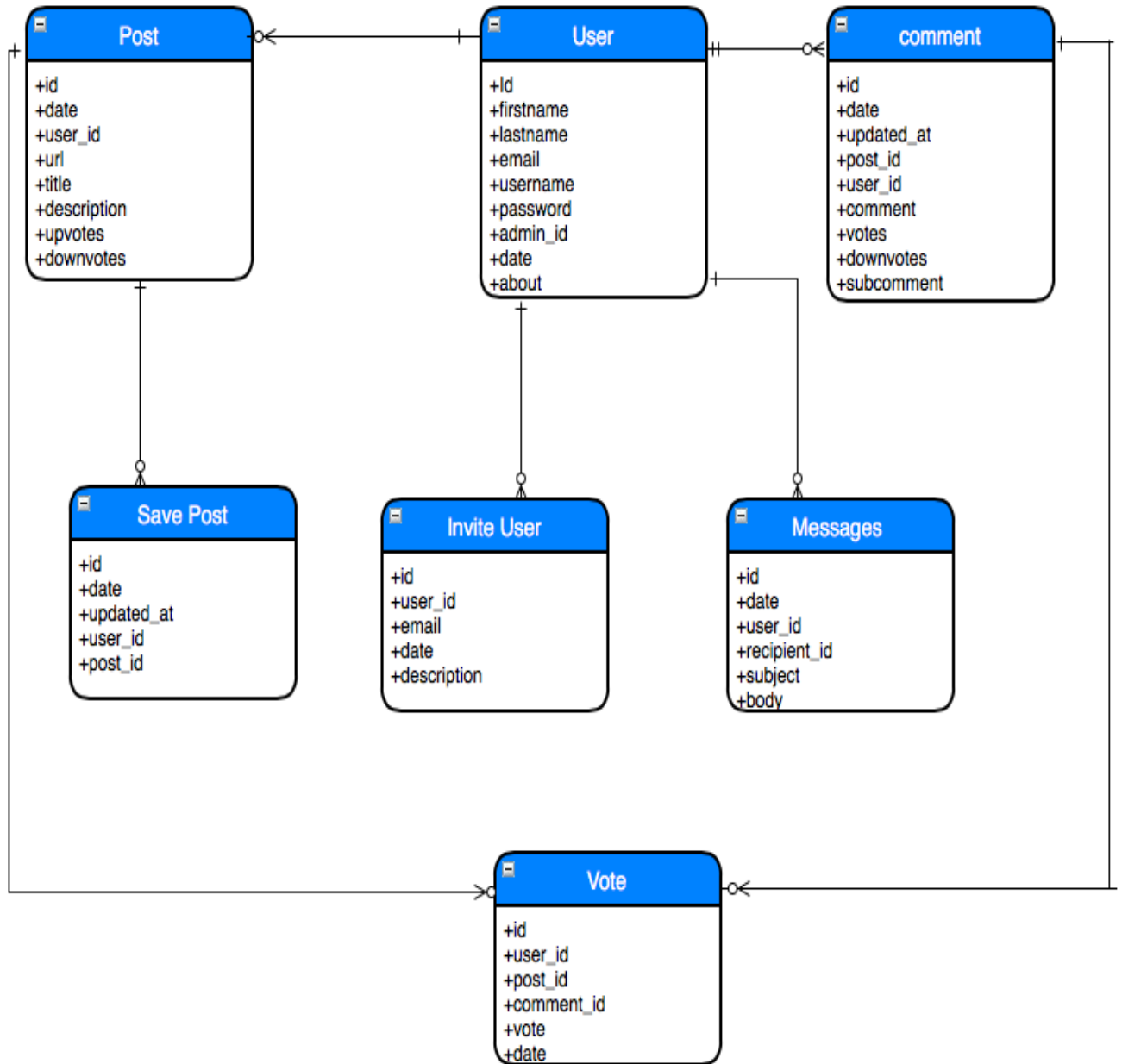
Figure 3.9 Entity relationship diagram for the lobster_dev database.

CHAPTER FOUR

SYSTEM IMPLEMENTATION

4.1 INTRODUCTION

The system implementation of the online knowledge sharing system involved the use of certain tools and components that were used in the process of executing the system. This chapter further explains the system implementation process, the hardware and software requirements of the system, the program documentation process and the testing of the system. It also explains the system requirements and its sections, the assessment process and the program modules and interfaces.

4.2 SYSTEM REQUIREMENTS

The system requirements are the requirements that are needed in other to run the system, the minimum software and hardware that must be available in the system.

Table 4.1 The Software Requirements Table

Requirements	Software
Operating system	Mac OS (10+), Linux (v3.2 kernel or higher), Windows XP or higher
Web browser	Any web browser of the users choosing
Database	MySql
Development platform	Microsoft Visual Studio Code
Development tool	Ruby on Ralis 5.x
Programming language	Ruby, SQL, Javascript, HTML/CSS

Table 4.2 The Hardware Requirements Table

Requirements
CPU Architecture (Unix-based OS (64-bit), Windows (64-bit))
X86-based Processor with clock speed above 500MHz
RAM memory size of at least 1GB
Hard disk size for at least 10GB
Network capability (LAN or Wireless LAN)

4.3 THE IMPLEMENTATION TOOL USED

Microsoft visual studio code is the development platform in with the development and deployment of the system was done. Ruby, JavaScript and HTML/CSS were the main programming languages used. Ruby, which is object oriented used for the coding of the back-end functionalities while JavaScript, HTML and CSS were used in the design and presentation of the application front end. For the database, MySQL database was used and developed on MySQL Workbench.

4.4 SOFTWARE DEVELOPMENT METHODOLOGY

The software development methodology used for this project is the plan driven incremental method. The plan driven incremental method involves planning in advance and progress of the system is measured on this plan. For this project requirements were stated, the design and development phase were done as a series of increments. Thus, implementing the plan driven incremental method. Plan driven method was selected for this project due to the specifications and design being stated out before the implementation of the system. Figure 4.1 shows the plan driven development method.
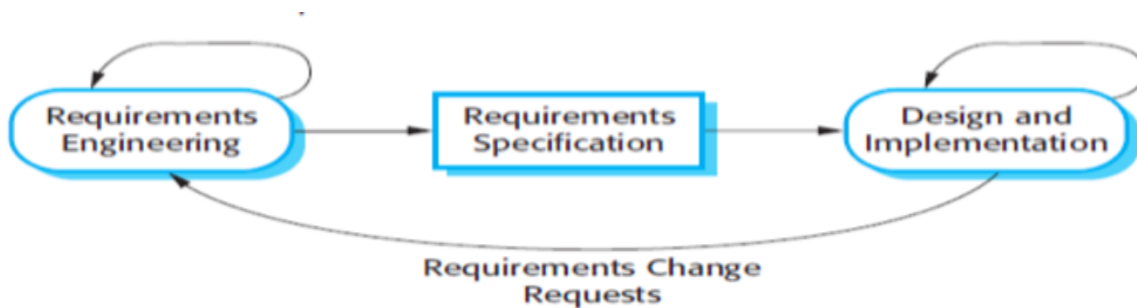
Figure 4.1 showing the plan driven development method

(source: uobabylon.edu.)

4.5 PROGRAM DOCUMENTATION

48

Program documentation consists majorly of the statements of roles of the functional units of the whole system. It is significant to make available the program documentation or source code for the following reasons

i. To enable future alteration at a larger stage during the system improvement.
ii. Ensuring the system maintenance procedure is easy and effective
iii. Ensuring the continuity of software development and improvements even if changes are made.

4.5.1 home page

The home page is usually the first page/welcoming page that a user meets. Its how the tab for the user to login if he already has an account. It also shows the signup tab that enables users to register on the platform and in the advert of the visitor not interested in signup or logging in the system provides no services for them in order to ensure safety and security of data. The interface is shown in Figure 4.2
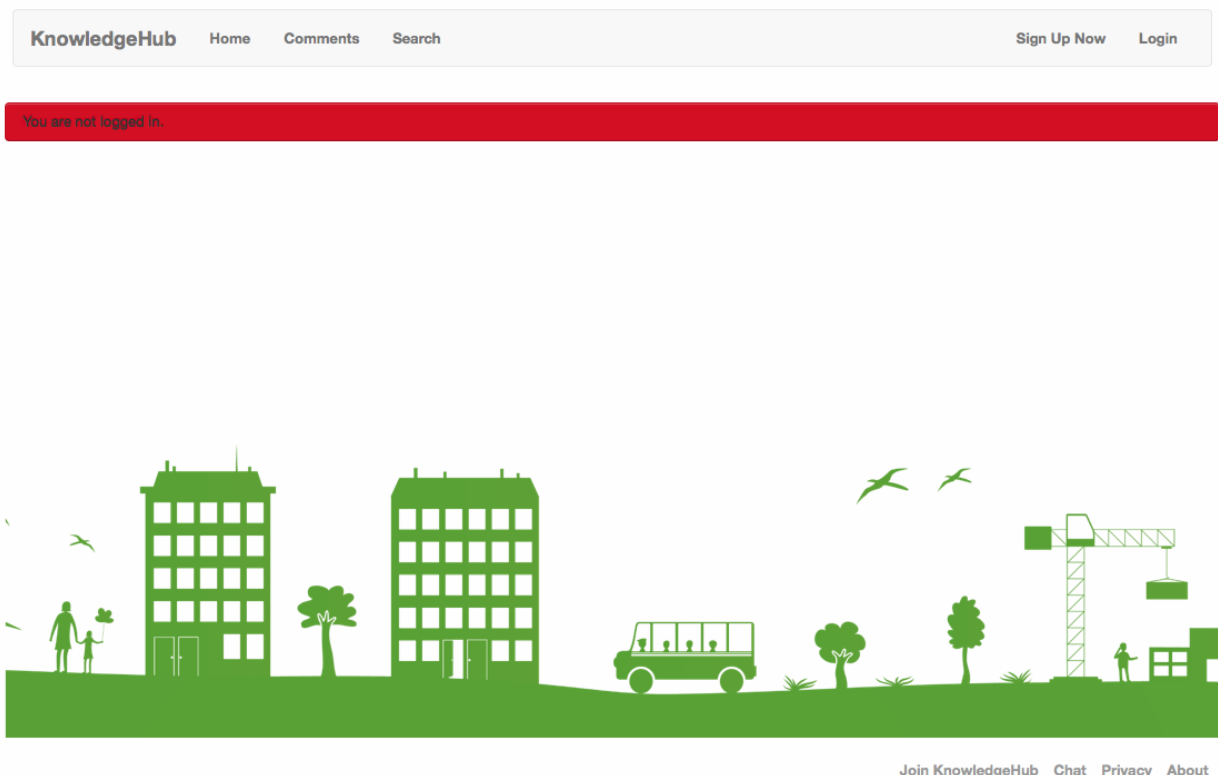
Figure 4.2 the system's Homepage

4.5.2 The Login Page

The login page comprises of an interface that receives two inputs which are the users' username or email and the password. The login interface has made available an anti-null functionality that makes sure each of the provided fields are filled. The login button makes use of a servlet that establishes a connection with the database and authenticates user credentials. On success, users are directed to their dashboard in order to proceed with their various activities. On entering wrong information, the servlet requests that the user tries again. Also, this interface provides a link to the registration page for unregistered customers on the platform. Figure 4.3 shows the login page of the system.

Figure 4.3 login page

4.4.3 Signup page

The sign page delivers an interactive interface for non-existing users and external visitors of the online knowledge sharing system to become members and registered users of this system. This systems interface requires seven different inputs from the visitor that are very vital to services provided by the platform. This system was implemented with input verifying functionality on username to ensure to two users of the platform share a username. The system also verifies the Email Address provided to ensure it contains valid characters such as the @ and characters. A verification is also made by requesting that the user types in his password twice in order to perform a password match and also to ensure a strong password is created. Once this process has been successfully completed the inputs are inserted into the database and the user can proceed to the Login page. Figure 4.4 shows the signup page

Figure 4.4 Signup page

4.4.4 Invite new user page

The invite new user page comprises of two inputs the email address of the new user to be invited and the invitation message to be sent to the user. After these two inputs have been provided the user can send the invitation out. Figure 4.5 shows the invite user page

Figure 4.5 invite new user page

4.4.5 Submit post page

The submit post page consists basically of four inputs, the URL to the post made is inputted, after which the title of the post to be uploaded is also provided by the user, the tag of the post is also selected by the user in order to ensure fast and easy search of posts then the last filed which allows the user to describe the post to be uploaded. After these fields have been completed the user then clicks the submit button in other to upload a post. Figure 4.6 shows the submit post page.

Figure 4.6 showing the submit post page

4.4.6 The saved post page

This page allows the user to view all the saved posts he/she has saved on the system. It shows all the details of the individual posts from the title, likes, the URL and the comments made under the posts. A user can also unsave the posts. Figure 4.7 show the saved post page.
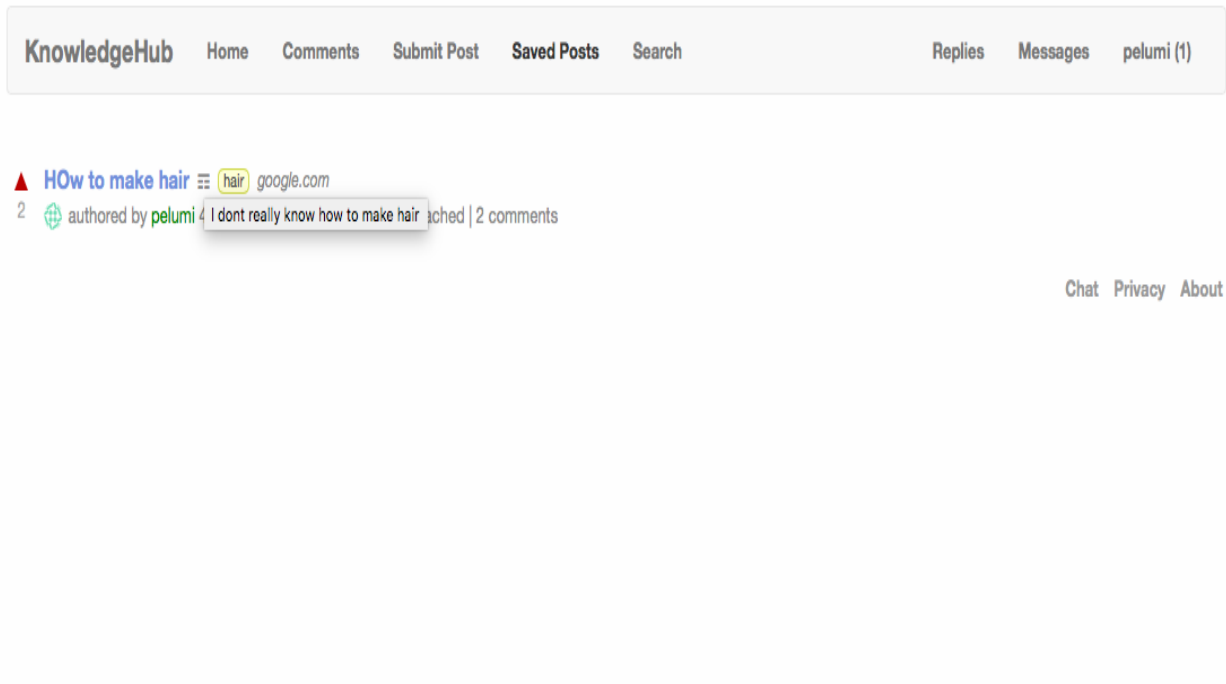
Figure 4.7 showing the saved post page

4.4.7 The comments page

This page allows the user of the system to view all the comments made by different users in the system. Figure 4.8 shows the comments page.
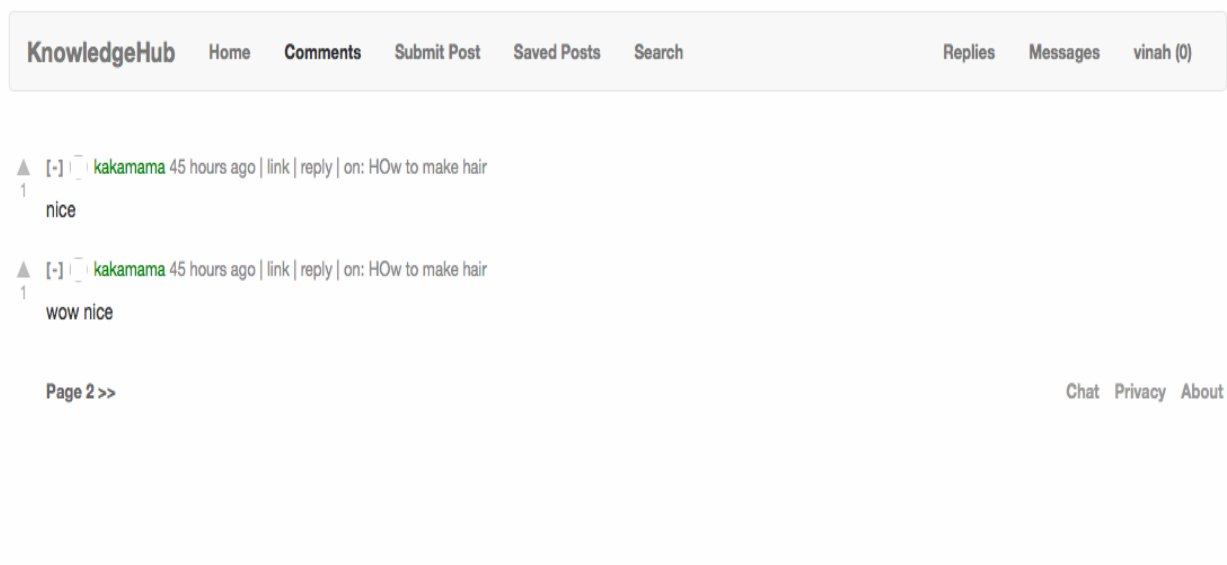
Figure 4.8 comments page

4.4.8 search page

The search page is a very important page of the system that allows users to search for posts or comments using the keywords or title to search. The search page shows two buttons in which the user selects if he/she wants to search by posts or search by comments. After he selected the preferred search button the user can further restrict the search by clicking either the relevant, newest or points button. This allows the user to restrict the search and get results faster. Figure 4.9 shows the search page of the system.

Figure 4.9 showing the search page

4.4.9 The message page

The message page comprises of three fields, the recipient's username, the subject of the message to be sent and the body of the message. Once all these have been entered correctly the user can send the message to the recipient. The users can also view the message that has been sent by clicking the view sent message button in other to view all the messages that has been sent. The

56

user can also view his/her private messages and also delete them whenever the need arises. Figure 4.10 shows the message page.

Figure 4.10 the message page

CHAPTER FIVE

SUMMARY, CONCULSION AND RECOMMENDATIONS

5.1 SUMMARY

Knowledge hub, an online knowledge sharing system is a system whose major goal is to fill the gap between individuals and sharing what they know. This system is very essential in the society especially in organizations, institutions and business where employee need to communicate and share knowledge in other to provide competitive advantage over other businesses, organizations and institutions. This system was created by using other existing system as model for the basis of development, it was also developed with the use of modern technology and tools which assists in improving the users experience on the system.

5.2 CONCULSION

The online knowledge sharing system will aid the users to share what they know, search for different topics on the system and also communicate with other users of the system. Students who were asked to review the system gave a positive review as they can use the system in their learning activities and also get insights from other students using the system. This signifies that students are satisfied with the functionalities and user interface.

5.3 RECOMMENDATIONS

The following recommendations have been stated below for suggested upcoming research in regarding the different aspects of online knowledge sharing.

i.   Improving the post uploading format from pdf and text to other formats such as images, videos etc.
ii. Provision of a more improved communication or messaging medium for the users
iii. Implementing the system as an application that can be downloaded on mobile devices such as phones, tables etc.

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