ST. XAVIER'S COLLEGE

(Affiliated to Tribhuvan University)

Maitighar, Kathmandu

FINAL YEAR PROJECT PROPOSAL

ON

गुरुशिष्य –"A Project for Easier Assignment Management"
(CSC-404)

For the partial fulfillment of the requirement for the degree of Bachelor of Science in Computer Science and Information Technology awarded by Tribhuvan University

Under the supervision of
Er.Rajan Karmacharya
Supervisor/Lecturer

Submitted by

Sarita Karki(TU Roll No. – 4771/071)

Submitted to

ST. XAVIER'S COLLEGE

Department of Computer Science

Maitighar, Kathmandu, Nepal

June 21, 2018

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CERTIFICATE OF APPROVAL

The undersigned certify that they have read and recommended to the Department of Computer Science for acceptance, a project proposal entitled **गुरुशिष्य –"A Project for Easier Assignment Management"** submitted by **Sarita Karki (TU Roll No. – 4771/071)** in partial fulfillment for the degree of Bachelor of Science in Computer Science and Information Technology.

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ABSTRACT

Knowledge management system has been the most discussed topic now days. It is very difficult to manage the knowledge and disseminate among all from a single arena. More over among the teacher and the student it is the common issue that some in a group always misses the information, deadlines and notices. Today Knowledge Management(KM) is preferred in a modern and technical way. The project **गुरुशिष्य –"Where Everyone Learns!",** helps to manage the knowledge within a single workspace. Here the student never misses a notice and can meet every deadline. It is necessary for a teacher to know about each student's thought. So, this project, on the other hand helps to keep track of every assignments of the student and can get the feedbacks about the lectures. Here we can create a e-classroom so that everyone can learn equally. One posts the assignments and other can upload by completing the assignments. Moreover, this project adds some benefits such as notice of next day lectures, warning of assignment submission that can make student punctual.

Keywords: *Knowledge Management(KM), Single Workspace, Deadlines, Assignments, e-Classroom, notice.*

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LIST OF ABBREVIATIONS

ICT	Information and Communication Technology
KM	Knowledge Management
IDE	Integrated Development Environment
JVM	Java Virtual Machine
GUI	Graphical User Interface
MVC	Model View Controller
JSF	Java Server Faces
IT	Information Technology
SAAS	Software as a Service
HTML	Hypertext Markup Language
DFD	Data Flow Diagram
WORA	Write One, Run Anywhere
WAR	Web Application Archive

CHAPTER 1: INTRODUCTION

1.1 Background

गुरुशिष्य –"A Project for Easier Assignment Management" is a project which is simple implementation of the knowledge management. "Knowledge Management is the process of capturing, distributing, and effectively using knowledge" [1].

Knowledge Management System is important to create knowledge base of captured tacit and explicit knowledge of staff and students/ Institute, to study the application of ICT and web technology for creating knowledge base and to share resources or knowledge of an Institute [2].

Knowledge management prevents individuals from constantly reinventing the wheel, provides a baseline for progress measurement, reduces the burden on expert attrition, makes visual thinking tangible, and manages effectively large volumes of information to help everyone serve their clients better and faster [3].

In the context of learning implementation of new ideas e.g., knowledge management in organizations often is neglected. Knowledge management describes the conscious and systematic handling of the resource of knowledge and its targeted application within an organization (Reinmann-Rothmeier, Mandl, Erlach, & Neubauer, 2001). In the light of knowledge management measures we can demonstrate its implementation in educational organizations as well [4].

Huang (1998) suggested four major processes to form a culture of knowledge sharing and collaboration. They are: (1) making knowledge visible, (2) increasing knowledge intensity, (3) building knowledge infrastructure, and (4) developing a knowledge culture. From an academic knowledge perspective, the learning community should start at the individual level, create departmental knowledge, create domains of knowledge across departments that share academic interests or disciplines [5].

This project is solely related to the students and teacher where each one of them gets an equal chance to learn and share knowledge. It is targeted to those students who often miss the deadline of their assignments and to those teachers who can not manage to keep the track of each student's assignments. Each student can get the notices of the next day classes and deadline of each assignments. Likewise each teacher can get feedback about his/her classes.

1.2 Problem Statement

Knowledge management in schools and colleges is being implemented in the developed countries slowly. In our country too, it can be implemented in order the make the student and teacher interface easier. So, this project aims the effective implementation of knowledge management in the educational institutions to solve the daily and minor problems of both teachers and students.

1.3 Objectives

The project has the following objectives:

- Post the assignments and due date by the teachers.
- Deliver the finished assignments by the students through file uploading.
- Create interaction between teacher and student through feedbacks.
- Track the assignments of students by the teachers using download method.

1.4 Significance of the Study

The proposed project will be significant in the field of education in a sense that it will help to make the easier interface between the teacher and the student. None of the student will miss the shared knowledge and every teacher can track the works given. This system will be a small implementation of ICT in education using the idea of knowledge management. The growing negligence of student will no more be accepted by the teacher. The project will be more effective in the schools and colleges where not even mailing systems are used to share the

knowledge. As a whole by bringing the teacher and the student in a single workspace it will make the sharing of knowledge and information easier.

1.5 Methodology

The research method was based on how to apply the idea of knowledge management in the teaching and learning process. During this phase various articles and journals in the internet were referenced. Various projects related to the knowledge management in the education were read. One of the open source learning platform named "**Moodle**" was referred from the internet to gather the ideas and knowledge.

The main purpose of the research was to collect the information about:

- How can teaching and learning process in normal schools and colleges be improved?
- What is the factor due to which sharing of knowledge is lacking behind?
- What should be done to make the teaching learning process interesting using ICT?

By studying the above-mentioned points various ideas, knowledge and data have been collected to minimize the problems and slowly and effectively solve them. Hence, based on these collected information and data coding for the software will be done to develop the web application.

The feasibility study of the proposed project is as follows:

1. **Technical Feasibility**

   The proposed project is an implementation of knowledge sharing and management, a mostly discussed issue of the current time. Thus, it is technically feasible.

2. **Schedule Feasibility**

   This project will be completed within the given time frame as the project is planned wisely and will be done intensively.

CHAPTER 2: LITERATURE REVIEW

2.1 Background and Research

Knowledge is one of the most important assets of a school organization and is critical for school sustainability. Sallis and Jones defined knowledge as "information in use, and the interaction of information with the human mind, which gives it meaning and purpose." Knowledge is constructed through an "accumulation of facts, procedural rules or heuristics through our daily experience and study" [6]. Knowledge management in Education is a monograph that makes eminent sense- a wonderful combination of good intuition, practical know-how, and a feel for what might be best described as a set of emerging theories focusing on the effective management of knowledge in educational institutions. Along the way, Knowledge Management in Education supplies us with a framework for understanding how good assessment practice, in fact, depends on effective information management [7].

Knowledge management series is a four-part series that will focus on the need and opportunities of KM in the education sector; process of applying KM through a knowledge audit; the common difficulties and limitations regarding the implementation of knowledge management into an education institutions' organizational cultures and the recommendation and next steps are reviewed and discussed. Organizations are starting to understand and appreciate knowledge as the most valued asset in the emerging competitive environment. The objective of Knowledge Management (KM) is to improve the quality of the contributions people make to organizations by helping stakeholders to make sense of the context within which the organization exists, to cooperate and share what they know and learn, and to effectively challenge, negotiate and learn from others [8,9].

In knowledge management education, people will understand knowledge itself. Learning becomes a dynamic, multidimensional, integrated, interactive process and knowledge is managed efficiently and effectively in school, in college and university, on the job, in our personal lives and in the community. Education based on a practical theory will become infinitely less controversial than education based on abstract theory. Debate over education as a true profession will cease to exist [10].The research highlights the fact that helps the system to maintain the valued learning that facilitates the system to generate an innovative model

which provides the solution in developing knowledge quality culture in academia. This study focuses to signify the relationship among knowledge and quality learning culture in higher education system and to introduce innovative qualitative knowledge of quadrant model that identifies the different phases to implement the qualitative knowledge strategies among higher institutes in the developing countries such as Pakistan, Sri Lanka etc[11].

2.2 The Origins and Development of Knowledge Management

The knowledge management program began in 2001 as an onsite, in person program located at the Kent State University campus in Kent Ohio. In 2007 the knowledge program transitioned to a fully-online program. Furthermore, in 2007, there was sufficient interest to warrant the creation of a second academic product – a Graduate Certificate in Knowledge Management. In 2012, the program has grown to close to 100 students, has a faculty of twelve full and part-time instructors, and is engaged in research with public and private organizations[12]. KM has gone through four stages:

(1) An emphasis upon the new technology and upon the development of "best practices" or "lessons learned".
(2) An increased recognition of human and cultural factors, and upon the development of "communities of practice" to facilitate the sharing of information.
(3) An increased recognition of the importance of designing the systems for retrievability, and the importance of data design and structure, including taxonomy development and utilization.
(4) An emphasis upon extending KM systems beyond the parent organization to include, for example, vendors and suppliers, customers, users, alumni, etc.

KM has exhibited remarkable staying power and growth in a fashion that is dramatically different from all other business enthusiasms of the late 20th century.2.3 Tools used [13].

2.3 Similar Tools Used

2.3.1 NetBeans

NetBeans is an open-source integrated development environment (**IDE**) for developing with Java, PHP, C++, and other programming languages. NetBeans is also referred to as a platform of modular components used for developing **Java** web applications. NetBeans is coded in Java and runs on most operating systems with a Java Virtual Machine (**JVM**). NetBeans IDE modules include NetBeans Profiler, a Graphical User Interface (GUI) design tool, and NetBeans **JavaScript** Editor [14].

NetBeans could be used in the development of web apps for knowledge management as it is an easier platform for building web pages. It can be easily used to compile the Java code and connect database easily.

2.3.2 Java

Java is a programming language and computing platform first released by Sun Microsystems in 1995. There are lots of applications and websites that will not work unless you have Java installed, and more are created every day. Java is fast, secure, and reliable [15].

Java is used quite extensively to create web applications, and it is done using the Java Enterprise Edition. The Java EE stack includes a standard MVC-framework, Java Server Faces (JSF), which gives you a well-designed abstraction of the complexity of a web application. Java is used in java web app development via the java enterprise edition J2EE, a java technology for developing dynamic web applications [16].

Java can be used for the server-side scripting. It can be used for coding the logical part strongly.

2.3.3 Mysql

MySQL is a Relational DataBase Management System (RDBMS). MySQL operates using client/server architecture in which the server runs on the machine containing the

databases and clients connect to the server over a network. It uses SQL server(This is an engine which provides access to your databases), Client programs for accessing the server and client library for writing your own programs [17].

Many researchers have invested efforts into investigating the factors affecting implementation of KMS of firms. However, their proposed factors are slightly different from each other such as: strategic relevance of IT, installed user-centric technologies, and the levels of IT investment (Ryan & Prybutoka, 2001); technological factors including relative advantage, complexity, and compatibility, organizational factors including management support, company structure, and corporate culture, environmental factors including competitors‟ pressure and requirements from business partners (He & Wei, 2004); organizational IT competence, KMS compatibility, KMS complexity, KMS relative advantage, lack of cross department interaction, the opinion and behaviour of top management [18].

In KMS MySQL can be used as database that can store huge amount of data. It can be used effectively as it is an easier database to handle.

2.4 Related Projects

2.4.1 Moodle

The modern developing economical structure is characterized by the increasing value of the notion of knowledge management (KM), which, replacing the more traditional factors, is addressed as one of the most significant concerns of almost any large organization. The use of up-to-date knowledge is of high strategic importance and is required for innovations development as well as for providing internal changes in organizations. Speaking about managing knowledge, it is reasonable to consider the two elements, without which KM performance will be meaningless: the tools which 50 Mariia Rizun assist the process of KM and the people, who apply knowledge with the help of these tools [19].

KM systems for workers at educational institutions, we can choose the open-source learning platform Moodle (further – "Platform"). Moodle is a free and open-source software learning management system. Developed on pedagogical principles, the Platform is used for blended learning, distance education and other e-learning projects in schools, universities, workplaces and other sectors. The Platform is used to create private websites with online courses for educators and trainers. Moodle is an acronym for Modular Object-Oriented Dynamic Learning Environment [20,21].

2.4.2 ProProfs

ProProfs, founded in 2010 and headquartered in Santa Monica, CA, is a cloud based and SAAS ("software as a service") company. Its services are offered both on a freemium and subscription basis. The company's software products include a quiz, survey, online course creation tool as well as a knowledge base software. ProProfs also provides an LMS Software that supports reporting features. The company's tools are used for business, education, e-learning and so on [22].

ProProfs is a powerful online platform designed to effectively organize and distribute knowledge, enrich the collective experience and improve accessibility and searchability of information. It ensures centralized access to all files and documents, facilitates the onboarding process of new hires, improves productivity and increases the output. Cloud-based platform with easy access from anywhere and anytime and support of word docs, PDFs, e-books, excel sheets, Prompt import and export of files, Version history, Efficient Google-like search are features of ProProfs [23].

2.5 Discussions on Knowledge Management

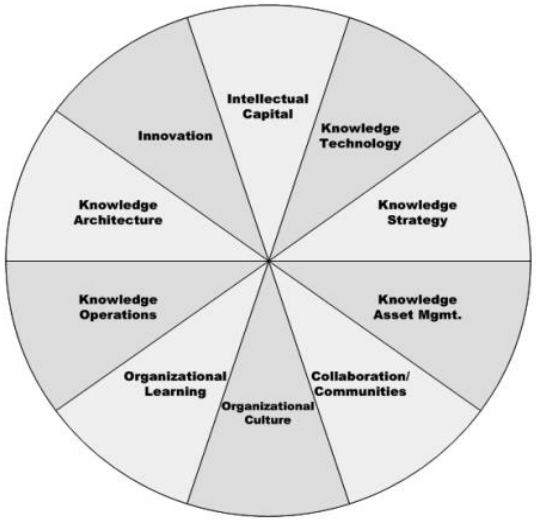


Figure 1: Ten facets of knowledge management [24]

KM technologies focuses primarily on the hard aspects of knowledge work. This includes building applications, delivering technology solutions, the seamless integration of knowledge technologies into the business context, the configuration of virtual environments and applications to support knowledge workers wherever they are working, and the development of technologies to support knowledge creation, capture, exchange, discovery and preservation. Organizational Learning includes capabilities that support a learning organization, including organizational learning, group learning, individual learning, situational learning, lifelong learning, learning in virtual environments, instructional design, and problem solving methodologies [25].

Biloslavo and Trnavcevic (2007) expressed the importance of KM in higher education; similarly Dawson (2000) expressed term as “KM is especially important for organizations, comprised of experts where success depends upon generation, utilization and uniqueness of knowledge base. It would seem to be appropriate to consider higher educational institutions as organizations comprised of experts who contribute to knowledge base [26].

Internationalization of higher education, lifelong learning, and paradigm shift from teaching to learning, new technologies and globalization are the key factors in developing knowledge management. KM manages huge data systematically and therefore it will be a powerful tool to enhance productivity and reduce cost in the collection of a huge volume of data. It is very difficult to record tacit knowledge created by institutional staff. If KM practice is being operated in an institute as a continuous activity, then only the generated knowledge could be captured and recorded as well preserved for future use. Similarly inspecting officers while visiting and assessing the gradation of the institution's educational development and contribution reviews all tacit and explicit knowledge of past years, and in such practices, KM plays a vital role [27].

Knowledge is the key for decision making and strategy creation. Knowledge should transfer into an action but unfortunately it does not happen always. In order to sustain in competitive world all educational institutes should implement effective tools for knowledge management. Barbara Friehs (2000) mentioned following assignments for effective KM:

- Mobilize the hidden implicit/tacit knowledge
- Integrate knowledge from organization and make it accessible to all
- Identify the missing knowledge
- Create new knowledge
- Make knowledge more accessible and usable
- Create knowledge sharing culture to experiment and learn
- Evaluate and reflect learning processes [28].

2.6 Future directions on Knowledge Management

Regardless of the contribution of numerous authors on knowledge sharing and transfer, there's still much to be explored. Knowledge sharing and transfer have been studied mostly in developed countries; studies in the same context can be conducted in developing countries. The role of affective and cognitive trust in sharing and transferring knowledge can be explored further. The role of social media and web 2.0 technological tools can be explored in promoting

knowledge sharing and transfer. Online knowledge sharing and transfer in different cultural contexts and organizations can be studied. Knowledge sharing and transfer across hierarchical levels in an organization can be explored. In this regard, the impact of organizational politics on knowledge sharing and transfer can be revealed [29].

Attitude and behaviors of knowledge sharers and receivers can be studied particularly in a political environment. What problems an organization is likely to face if knowledge is not shared or transferred within organization and its subsidiaries, across the globe, can be studied in detail. The impact of national culture can be studied in the context of knowledge sharing and transfer. Knowledge sharing and transfer also depend on the individual characteristics of the knowledge sharer and receiver. This concept can be investigated further. Communication is assumed to be the facilitator of knowledge sharing and transfer. However, communication quality and quantity that are necessary to facilitate knowledge sharing and transfer can be studied. Furthermore, various formal and informal communication tools, at organizational level, can be investigated [30,31].

2.7 Barriers to Knowledge Management and Sharing

Lack of trust among individuals is the biggest barrier that inhibits sharing of knowledge with others in the organization. Lack of incentives and rewards systems can hinder knowledge sharing and transfer, and motivation plays an important role for the knowledge sharer. Organizational culture has been recognized as a significant barrier to knowledge sharing. Power distance and individualism / collectivism are two of Hofstede's cultural dimensions that are important factors affecting knowledge sharing and transfer. Hofstede's cultural of high power distance, low individualism, higher masculinity, and high uncertainty avoidance acts as a barrier toward knowledge sharing and transfer in Chinese organizations, as it prevents individuals from risk-taking and experimentation [32].

When it comes to transferring knowledge across a dissimilar culture, openness to diversity comes into play. When there is lack of time and workload is heavy, sharing and transfer of knowledge become difficult. Researchers have identified heavy workload as the major reason

for having limited or no time for knowledge sharing. Lack of technology hinders the successful sharing and transfer of knowledge, which confirms it as a barrier. Other identified barriers include: change in technology, lack of discussion boards, lack of resources; uniqueness of knowledge which has been studied as a significant related variable of partial knowledge sharing; lack of appropriate systems and an absence of coordination; lack of attention and appreciation, and fear of being foolish; ambiguity in the content and context of knowledge, along with the uncertainty; degree of tacitness in regard to knowledge sharing with social web tools; and lack of socialization among colleagues [33,34].

CHAPTER 3: SYSTEM DEVELOPMENT

3.1 Project Management Strategy and Tools

A project is a unique, transient endeavor, undertaken to achieve planned objectives, which could be defined in terms of outputs, outcomes or benefits. A project is usually deemed to be a success if it achieves the objectives according to their acceptance criteria, within an agreed timescale and budget [35]. Project management, then, is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. Project management brings a unique focus shaped by the goals, resources and schedule of each project [36].

3.1.1 Project Workflow and Schedule

- Team Size: 1
- Total Project Duration: 10 weeks
- Effort Required per person: 20 hours per week

3.1.2 Project Team

Table 1: Team Resource and Roles

Team Resource	Role
Er.Rajan Karmacharya	Supervisor
Sarita Karki	Developer/Designer

Table 1 shows the member associated with the design and development of the project. Project supervisor has the responsibility of observing throughout the project development and provide guidance for each phase of the project. The project managers are required to prepare their design and develop the project according to the necessary criteria and under direct supervision of the supervisor.

3.1.3 Responsibilities

The different roles and responsibilities were done by the team member using the knowledge and skills she had. The supervisor initiated the project's various aspects and enhanced project quality through effective mobilization and encouragement of the team member as well as monitoring overall project. The team member has the responsibility to do research on the project to meet each objective of the project

Responsibilities of Supervisor

- Schedule the project
- Help understand performance and goal of project
- Provide essential information
- Track the progress of the project
- Provide real-time feedback
- Share the information and experience
- Assist in resolving emergencies
- Motivate and encourage the team members

Responsibilities of team member

- Preliminary research regarding the project
- Background reading
- Design and Analysis Development and Testing
- Implementation and System Evolution
- Draft report writing and submission
- Final report writing and submission

3.1.4 System Development Tools

3.1.4.1 NetBeans

NetBeans is an open-source integrated development environment (**IDE**) for developing with Java, PHP, C++, and other programming languages. NetBeans is also referred to as a platform of modular components used for developing **Java** web applications. NetBeans is coded in Java and runs on most operating systems with a Java Virtual Machine (**JVM**) [37].

NetBeans was used as the IDE for this project. It was useful for this project to compile the java code and run it easily in small time. Similarly, it also helped to connect to the database quickly using the Glassfish server.

3.1.4.2 Java

Java is a programming language and computing platform first released by Sun Microsystems in 1995. Java is fast, secure, and reliable . The Java Plug-in software is a component of the Java Runtime Environment (JRE). The JRE allows applets written in the Java programming language to run inside various browsers The Java Plug-in software is a component of the Java Runtime Environment (JRE) [38].
Java was used as the server-side scripting language. Most of the business logics were coded using Java.

3.1.4.3 Mysql

MySQL is a Relational DataBase Management System (RDBMS). MySQL operates using client/server architecture in which the server runs on the machine containing the databases and clients connect to the server over a network. It uses SQL server, Client programs for accessing the server and client library for writing your own programs [39].
MySQL was used as the database. All the database tables were created using MySQL and the required data and files were inserted using MySQL queries.

3.1.4.4 Java Server Pages(JSP)

Java Server Page (JSP) is a technology for controlling the content or appearance of Web pages through the use of servlets, small programs that are specified in the Web page and run on the Web server to modify the Web page before it is sent to the user who requested it[40].

JSP was used as the server-side scripting language. It was used to insert both the HTML tags for designing web pages and to insert the Java for using logics. Another main part of JSP was in uploading and downloading files using servlet.

3.1.4.4 Draw.io

Draw.io is an open source technology stack for building diagramming applications, and the world's most widely used browser-based end-user diagramming application. With simple drag and drop techniques, it was used to darw the context diagram, flow charts, ER-Diagram, Sequence diagram and use case diagram.

3.1.4.5 Microsoft Word

Microsoft word as a word-pressing program was used to write all the reports about the **project.**

The documentation of the project was done using it since from the beginning of the report writing.

3.2 System Analysis

System analysis is a process of collecting and interpreting facts, identifying the problems, and decomposition of a system into its components. It improves the system and ensures that all the components of the system work efficiently to accomplish their purpose [41]. It can include looking at end-user implementation of a software package or product and looking in-depth at source code to define the methodologies used in building software [42].

In this project, the preliminary task was to get the basic knowledge on knowledge management. The project also had to remain feasible for implementation in normal classrooms of colleges.

After the research the tools were finalized like NetBeans for the medium project like this. Similarly, the time and risk were analyzed before proceeding with this project. The analysis phase of the project can be divided into the following phases:

- Feasibility Study
- Problem/ Risk Analysis
- Requirement Analysis
- Design and coding
- Decision Analysis

3.3 System Design

3.3.1 Data Flow Diagram

A data flow diagram (DFD) maps out the flow of information for any process or system. It uses defined symbols like rectangles, circles and arrows, plus short text labels, to show data inputs, outputs, storage points and the routes between each destination[43].

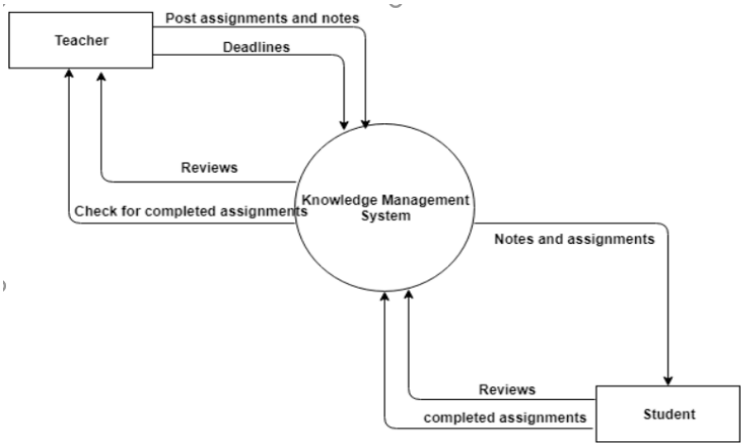


Figure 2: Context Flow Diagram

The above figure explains the DFD level 1 for the project. It shows the entities teacher and student and the Knowledge Management System.

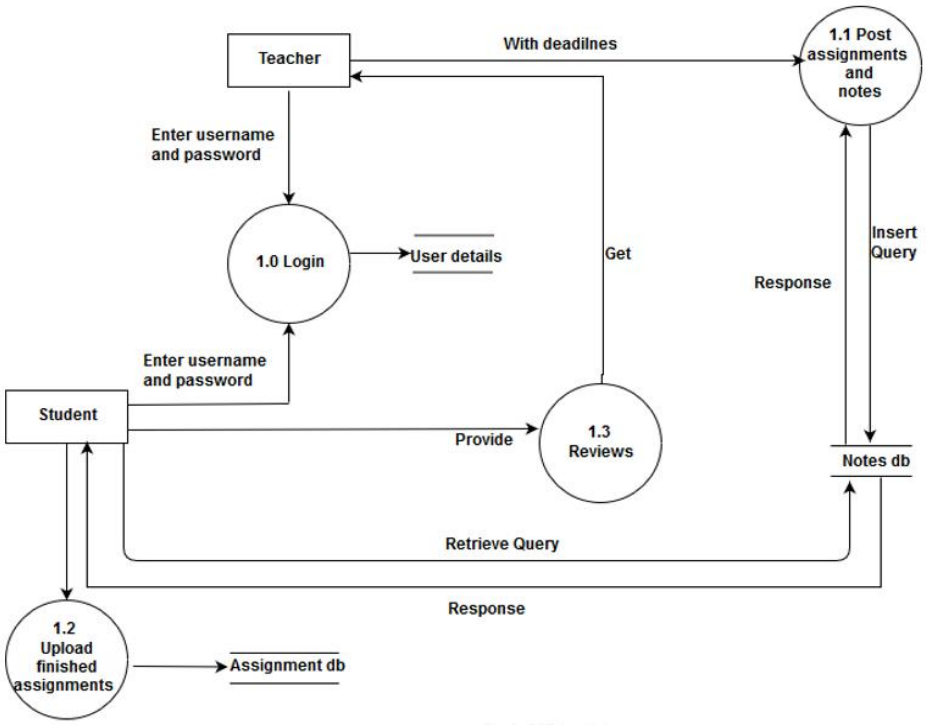


Figure 3:DFD level 1

The above figure is the DFD level 1 for the project. It explains the flow of data from process to process. The processes are denoted by the circle.

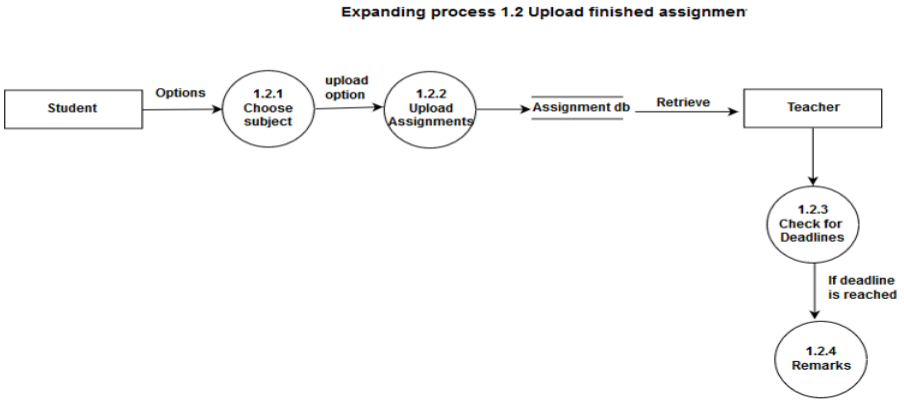


Figure 4:DFD level 2

The above figure is the expansion of the process 1.2 upload notes and assignments. It provides the sub-processes of that process.

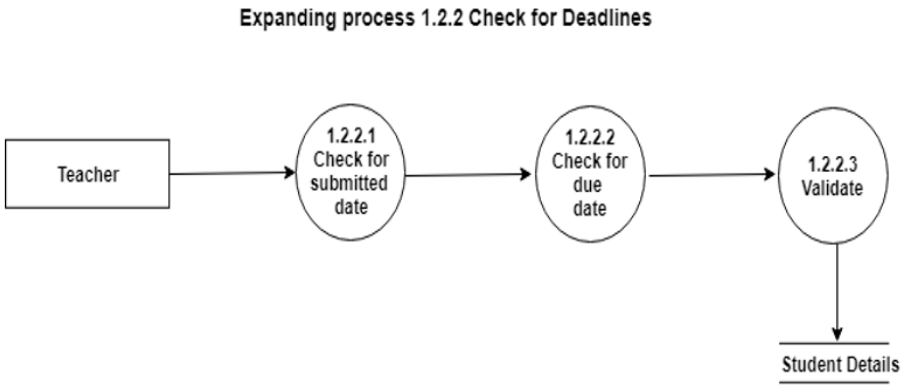


Figure 5:DFD level 3

Above is the figure for DFD level 3 which further explains the sub-process checking for details. It shows the storage of remarks in the database.

3.3.2 ER Diagram

An entity-relationship diagram (ERD) is a data modeling technique that graphically illustrates an information system's entities and the relationships between those entities. An ERD is a conceptual and representational model of data used to represent the entity framework infrastructure [44].

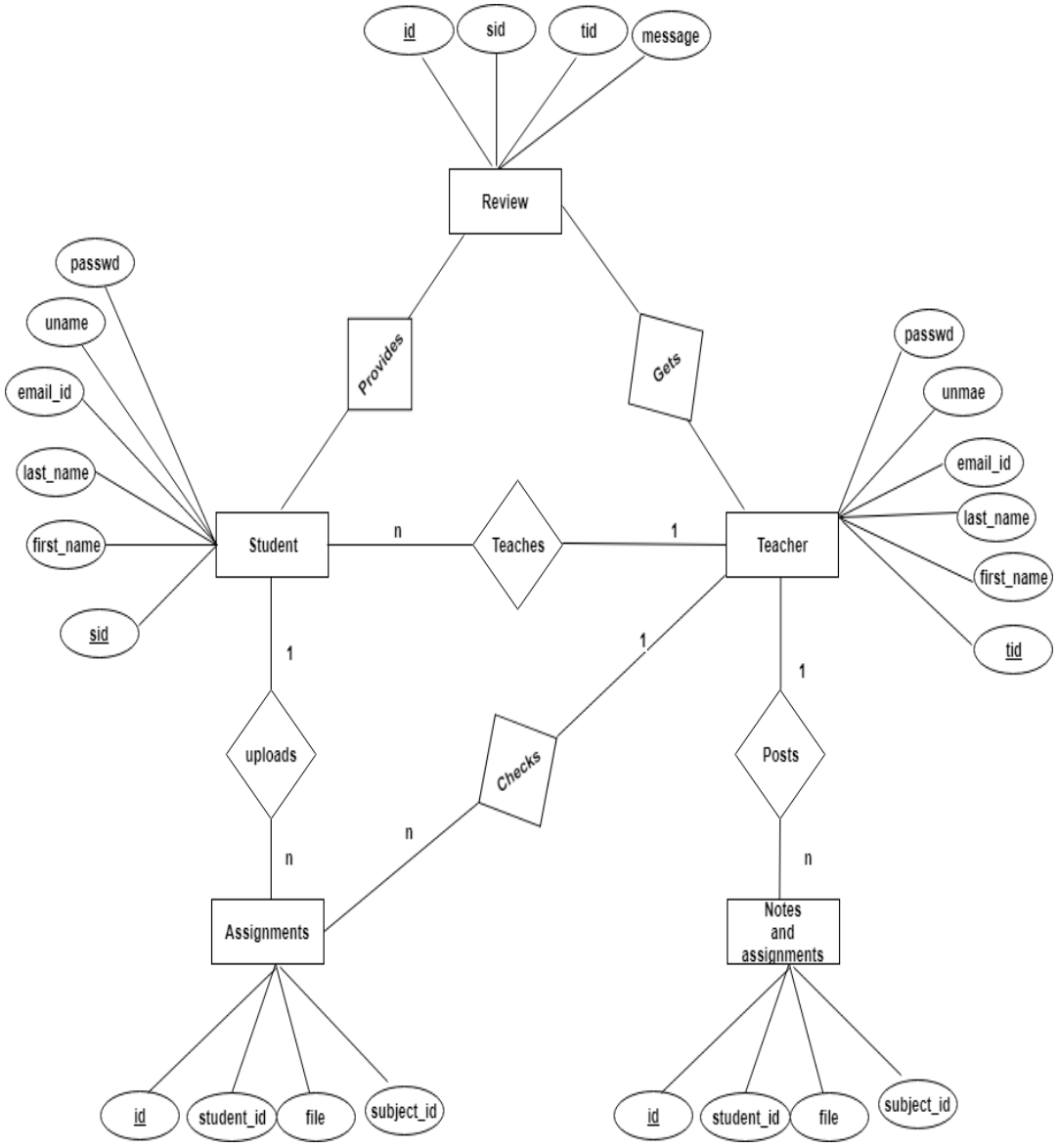


Figure 6: ER- Diagram

Above is the ER- Diagram for the project. It includes the entities attributes and the relations as shown in the figure. It describes the relation between teacher and student clearly.

3.3.3 Flow chart

A flowchart is a type of diagram that represents an algorithm, workflow or process. The flowchart shows the steps as boxes of various kinds, and their order by connecting the

boxes with arrows. This diagrammatic representation illustrates a solution model to a given problem [45].

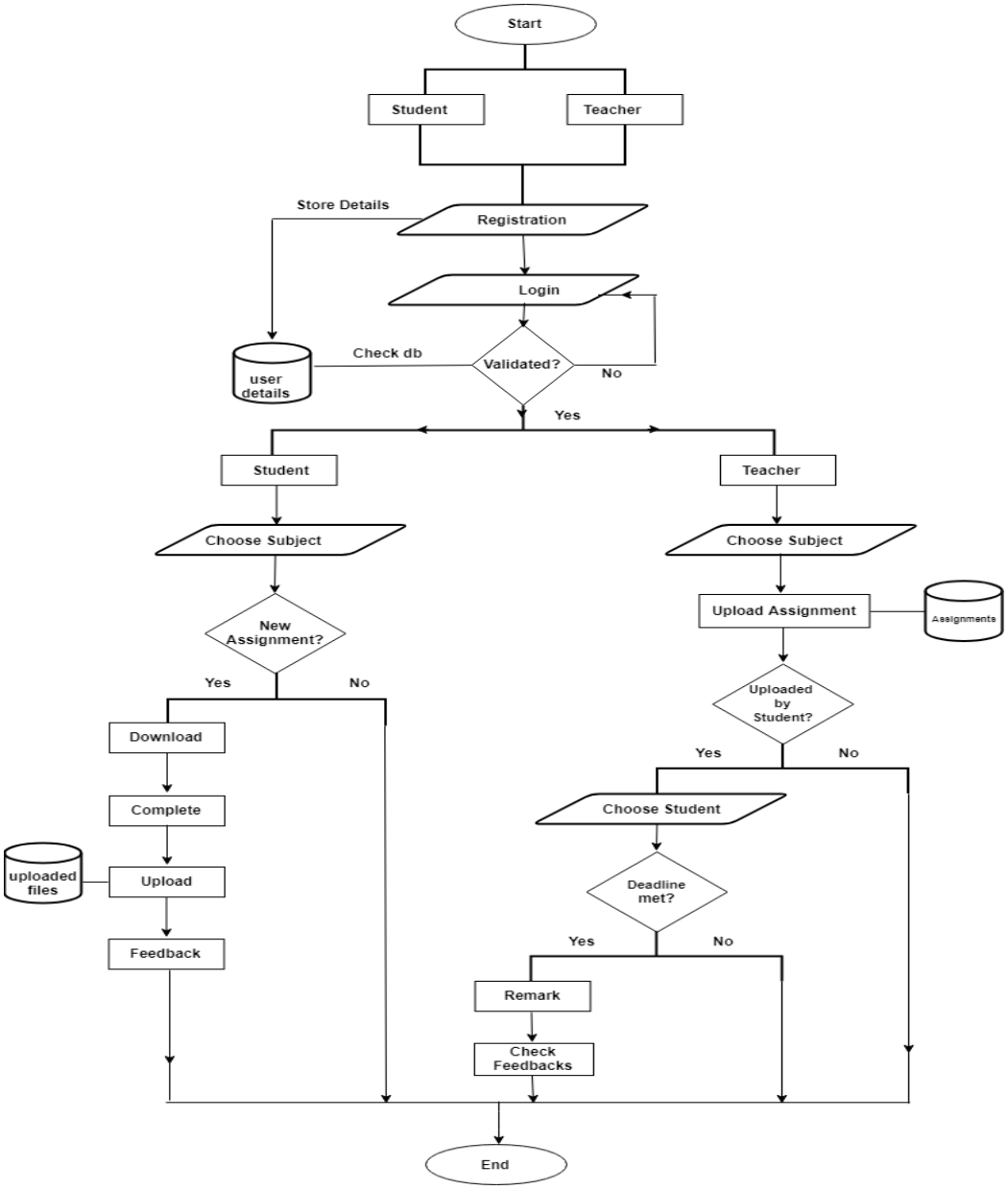


Figure 7: Flowchart

Fig describes the flowchart for the system developed. It shows how data are entered by the user into the system, how the system validates them and then finally provides response to the user. At, the end both the users exit from the system.

3.3.4 Database Schema

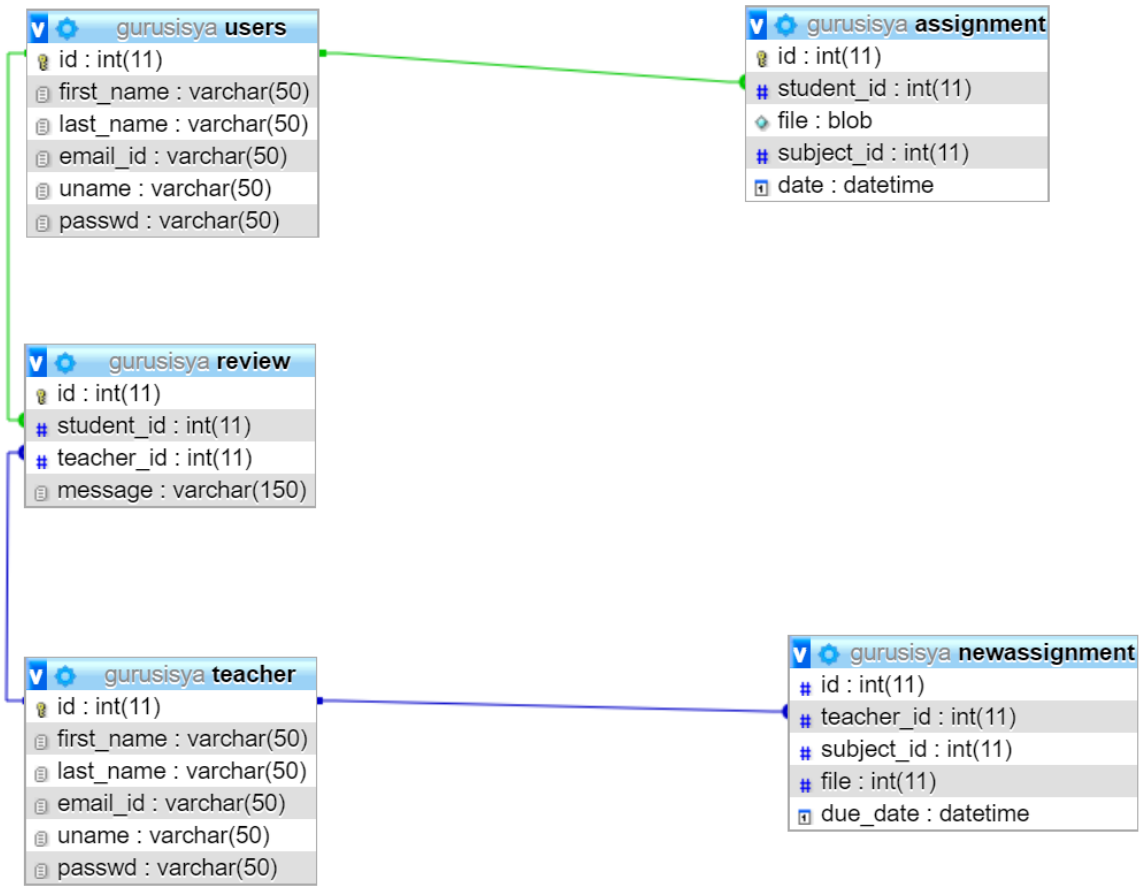


Figure 8: Database Schema

Fig shows the database schema for the system. The relationship between the tables is established through the foreign key. The attributes of the elements are clearly shown above.

3.3.5 Use case diagram

UML Use Case Diagrams. Use case diagrams are usually referred to as behavior diagrams used to describe a set of actions (use cases) that some system or systems (subject) should or can perform in collaboration with one or more external users of the system (actors) [46].

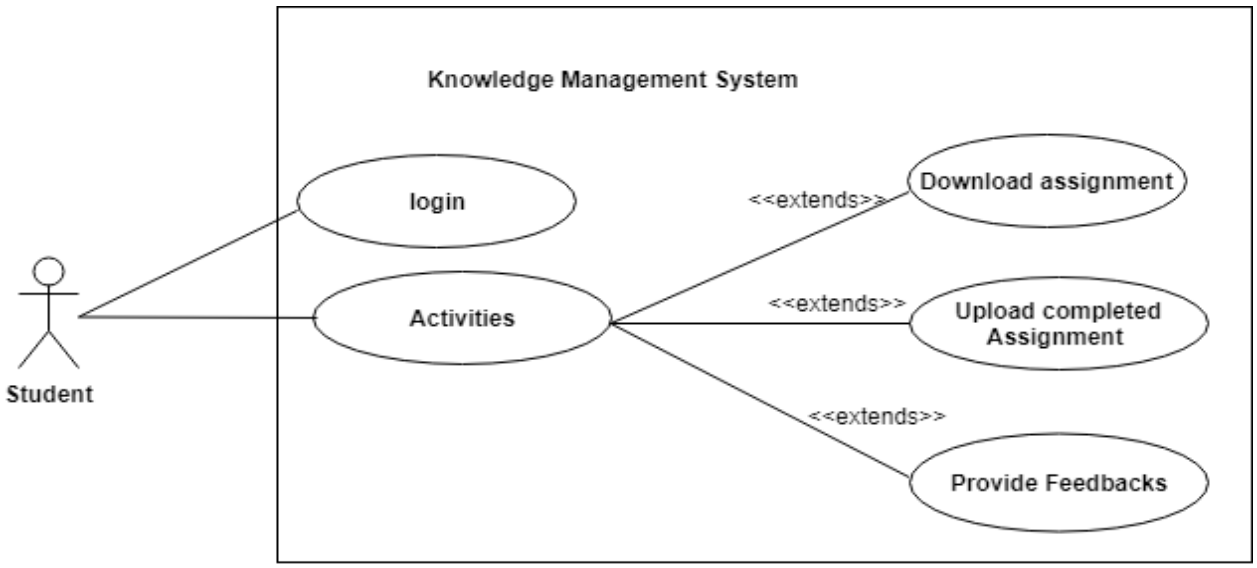


Fig : Use case for student

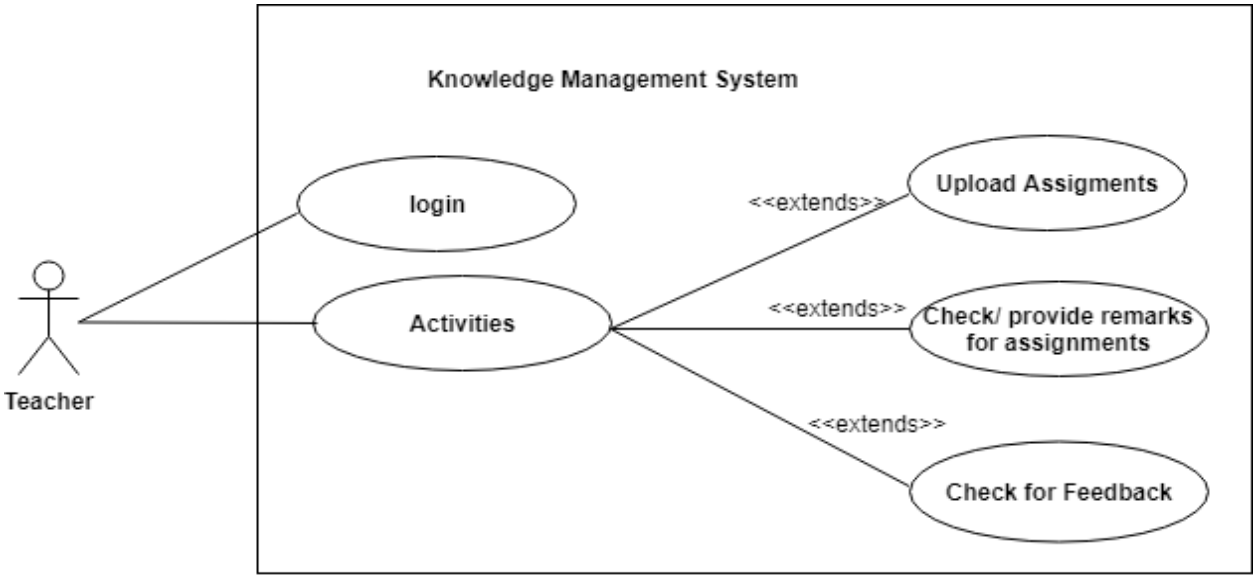


Fig : Use Case for teacher

Figure 9: Use case diagrams

Two figures above describe the use case diagram where the actors are teacher and the students. The actions are shown by the tag extends. They can perform the activities after they login to the system.

3.3.6 Sequence diagram

Sequence diagrams are sometimes called event diagrams or event scenarios. A sequence diagram shows, as parallel vertical lines (lifelines), different processes or objects that live simultaneously, and, as horizontal arrows, the messages exchanged between them, in the order in which they occur [47].

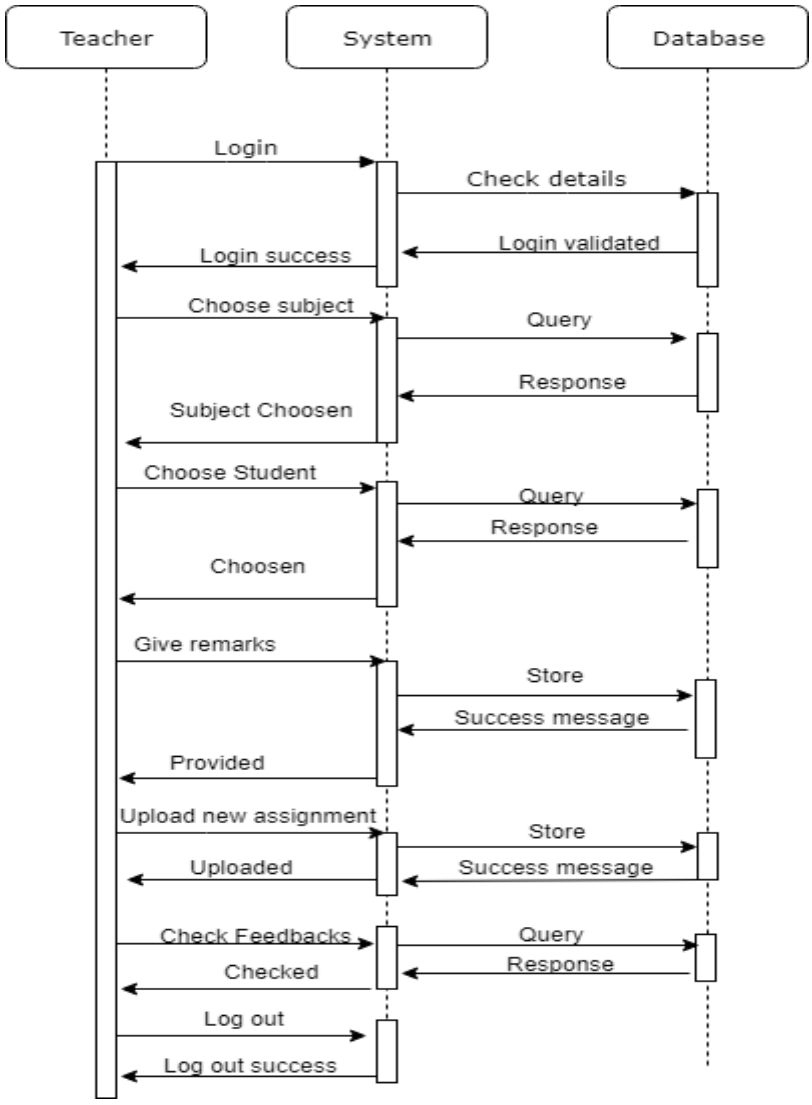


Figure 10:Sequence diagram for teacher

Figure above is the sequence diagram for the teacher. It shows the sequence of the acitivites that the teacher goes after entering into the system.

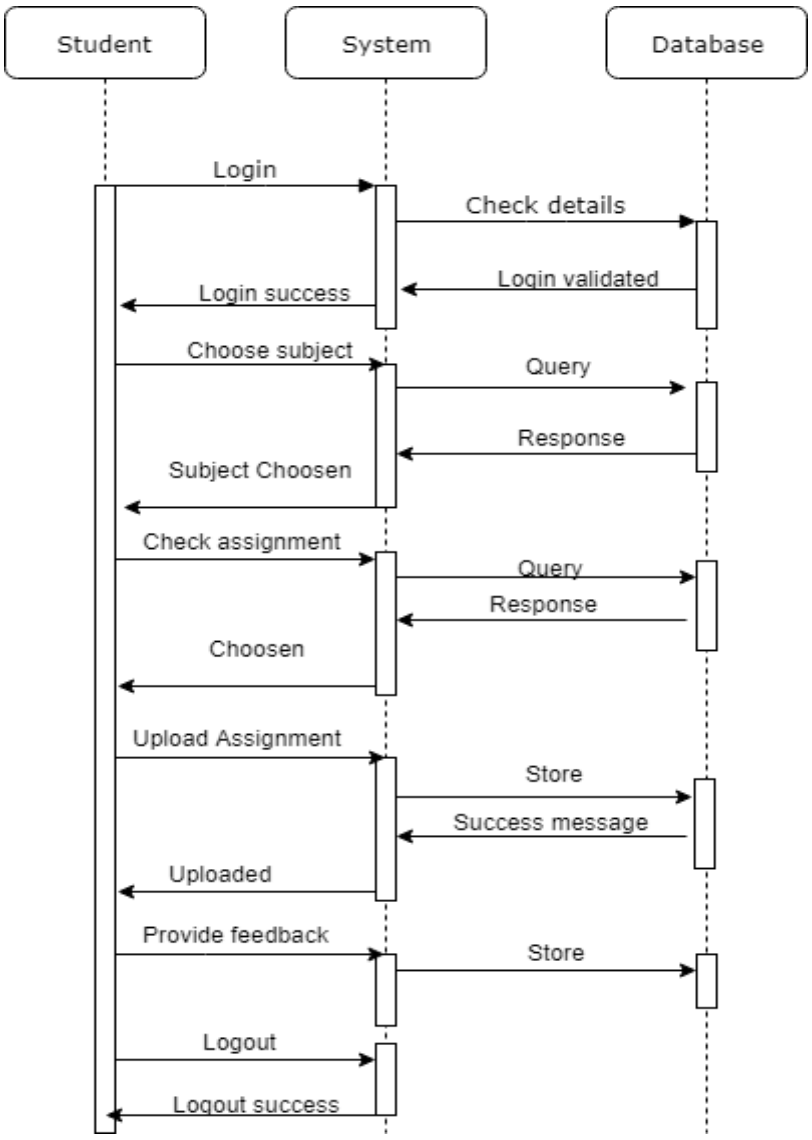


Figure 11:Sequence diagram for student

Figure shows the sequence diagram for the student like that of the teacher. Students also go through the sequence of above activities after they enter into the system.

3.4 Project Schedule

The project schedule is a schedule is a listing of a project's milestones, activities, and deliverables, usually with intended start and finish dates.

3.4.1 Time Schedule

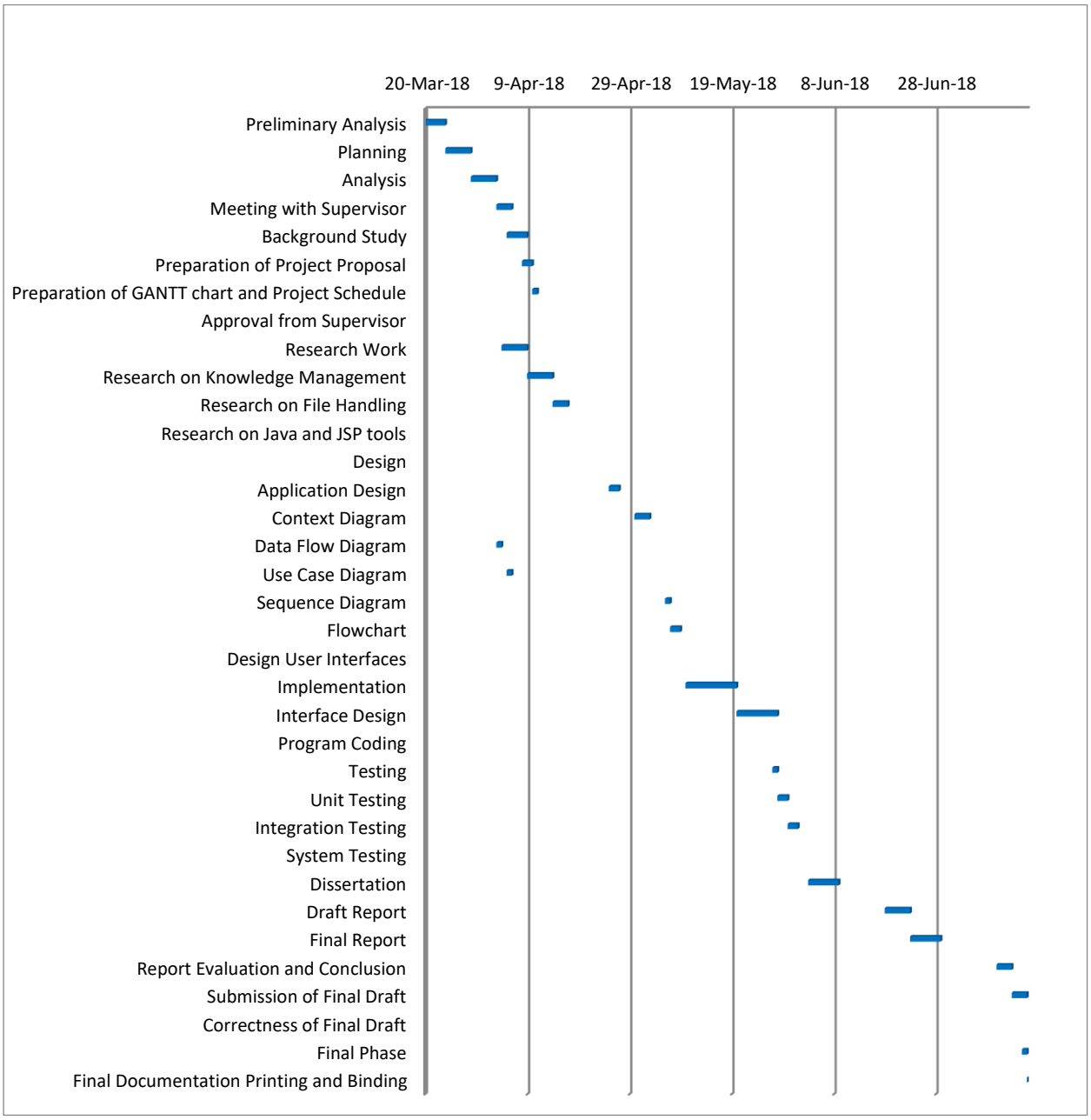
The detailed time schedule of this project is explained below.

Table 2: Time Schedule Table

Task Id	Task	Start Date	Duration	End Date
1	**Preliminary Analysis**			
1.1	Planning	43179	4	03/23/2018
1.2	Analysis	03/24/2018	5	03/28/2018
1.3	Meeting with Supervisor	03/29/2018	5	04/02/2018
1.4	Background Study	04/03/2018	3	04/05/2018
1.5	Preparation of Project Proposal	04/05/2018	4	04/10/2018
1.6	Preparation of GANTT chart and Project Schedule	04/08/2018	2	04/09/2018
1.7	Approval from Supervisor	04/10/2018	1	04/10/2018
2	**Research Work**			
2.1	Research on Knowledge Management	04/04/2018	5	04/08/2018
2.2	Research on File Handling	04/09/2018	5	04/13/2018
2.3	Research on Java and JSP tools	04/14/2018	3	04/16/2018
3	**Design**			
3.1	Application Design			
3.1.1	Context Diagram	04/25/2018	2	04/29/2018
3.1.2	Data Flow Diagram	04/30/2018	3	04/02/2018
3.1.3	Use Case Diagram	04/03/2018	1	04/04/2018
3.1.4	Sequence Diagram	04/05/2018	1	04/06/2018
3.1.5	Flowchart	05/06/2018	1	05/06/2018
3.1.6	Design User Interfaces	05/07/2018	2	05/08/2018
4	**Implementation**			
4.1	Interface Design	05/10/2018	10	05/19
4.2	Program Coding	05/20/2018	8	05/27/2018
5	**Testing**			
5.1	Unit Testing	05/27/2018	1	05/27/2018
5.2	Integration Testing	05/28/2018	2	05/29/2018
5.3	System Testing	05/30/2018	2	06/02/2018
6	**Dissertation**			
6.1	Draft Report	06/03/2018	6	06/08/2018
6.2	Final Report	06/18/2018	5	06/22/2018
6.3	Report Evaluation and Conclusion	06/23/2018	6	06/28/2018
6.4	Submission of Final Draft	07/10/2018	3	07/12/2018
6.5	Correctness of Final Draft	07/13/2018	3	07/15/2018
7	**Final Phase**			
7.1	Final Documentation Printing and Binding	07/15/2018	2	07/16/2018
7.2	Document Submission	07/16/2018	1	07/16/2018

3.4.2 GANTT Chart

The Gantt chart of this project is represented in the figure below, which shows all the activities that we carried out for this project and the time scale and the overall time schedule. The Gantt chart helps to visualize the overall processes involved in Smart Penalty System at once.



3.5 Testing

3.5.1 Unit Testing

Unit testing is a level of software testing where individual units/ components of a software are tested. The purpose is to validate that each unit of the software performs as designed. A unit is the smallest testable part of any software. It usually has one or a few inputs and usually a single output. In procedural programming, a unit may be an individual program, function, procedure, etc. In object-oriented programming, the smallest unit is a method, which may belong to a base/ super class, abstract class or derived/ child class. (Some treat a module of an application as a unit [48].

Unit testing in the system has been done in the following ways:

Table 3: Test cases

Test Case No.	Description	Expected Result	Actual Result	Status	Conclusion
Test Case 1	Test for assignments submission by teacher	Submission successful if same file is not uploaded before	Successful	True	File submitted successfully
Test Case 2	Test for assignment view submitted by students	View only the assignments of his/her subject and download	Successfully Viewed and was able to download	True	Assignment list viewed successfully
Test Case 3	Test for review view by teacher	View only his/her review	Only his/her review viewed	True	Review shown only to the one who logs in

Test Case 4	View the new assignments by student	View the distinct list of assignment of selected subject	Successfully listed and could be downloaded	True	List of added assignments by teacher could be viewed
Test Case 5	Post feedbacks by student	Provide Successful message	Successful	True	Redirected to the page with message

3.5.2.1 Test Case 1

Test Objectives: Test for assignments and notes upload by teacher

Test Performed: Upload the file from local drive

Output: File uploaded successfully and stored in database

Evidence:

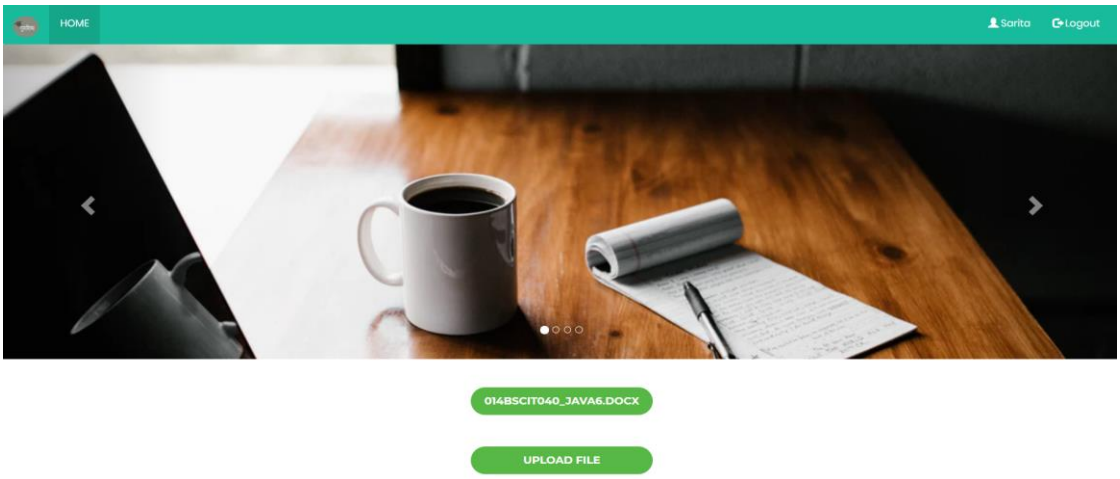


Figure 12: Upload file page

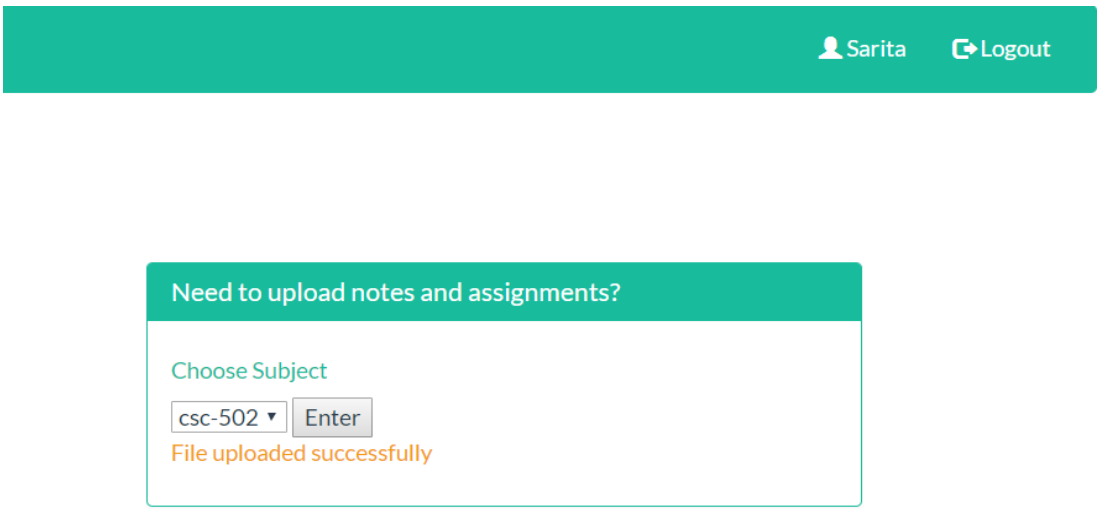


Figure 13: Upload success message

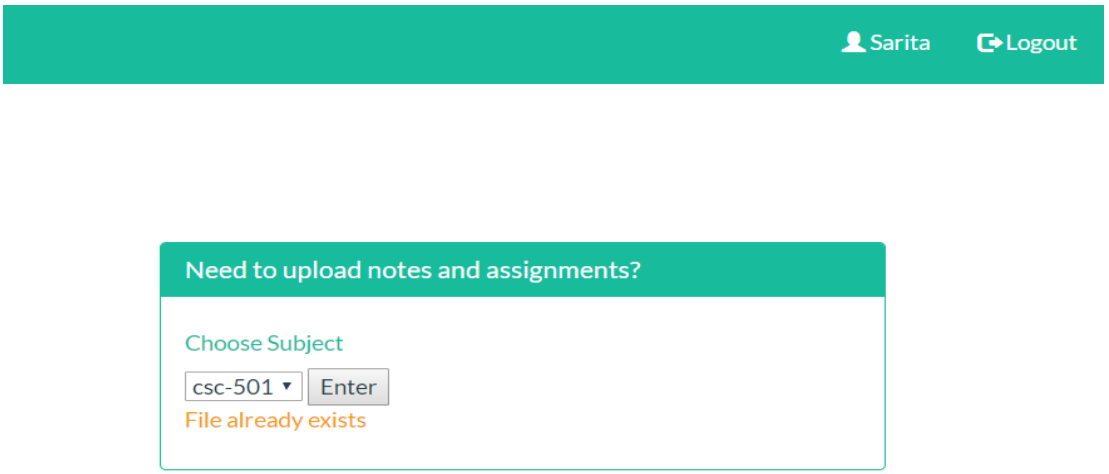


Figure 14: Upload fail message

The above figure shows the notes or assignments uploaded by the teacher from the local drive and then upload it successfully. If the file size is too large or same file is uploaded error occurs.

3.5.2.2 Test Case 2

Test Objectives: Test for submitted assignments view by teacher

Test Performed: View the submitted assignment of respective subject only

Output: Submitted Assignments of respective subject only seen

Evidence:

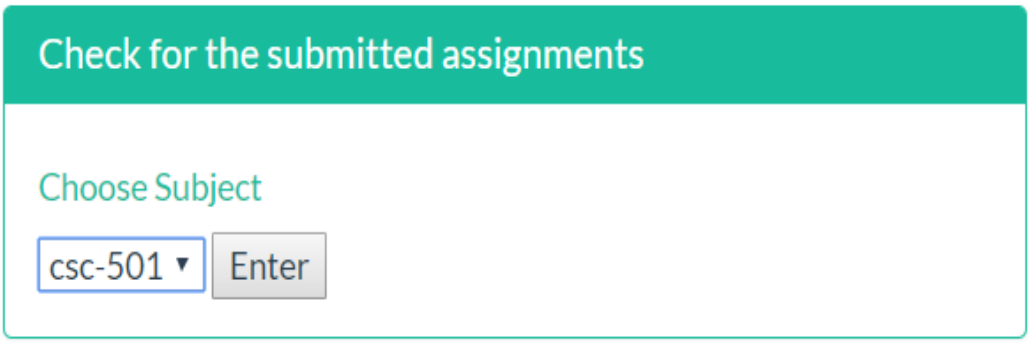


Figure 15 Selecting only respective subject

Figure 16: List of assignments with name and submission date

In the above figures the teacher can choose only the subject taught and then can see and download the assignments of respective subject.

3.5.2.3 Test Case 3

Test Objectives: Test for review view by teacher

Test Performed: View only his/her review

Output: List of review provided by student

Evidence:

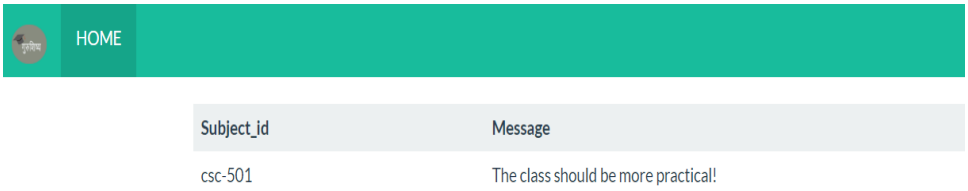


Figure 17: Review

Fig 6 above shows the feedback provided by student. Each feedback is secretive and can be seen by the teacher, who is logged into the system, his/her review only.

3.5.2.4 Test Case 4

Test Objectives: View the new assignments by student

Test Performed: View assignments of subject selected

Output: List of assignment of selected subject

Evidence:

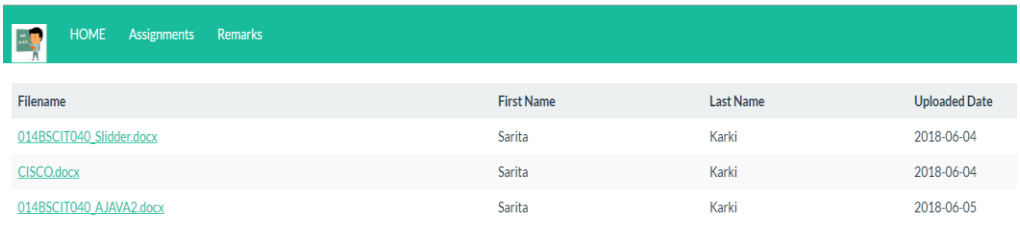


Figure 18: List of assignments for selected subject

Figure above shows the list of assignments of selected subject.

3.5.2.5 Test Case 5

Test Objectives: Give feedback by the student

Test Performed: Provide feedback

Output: Feedback submitted successfully

Evidence:

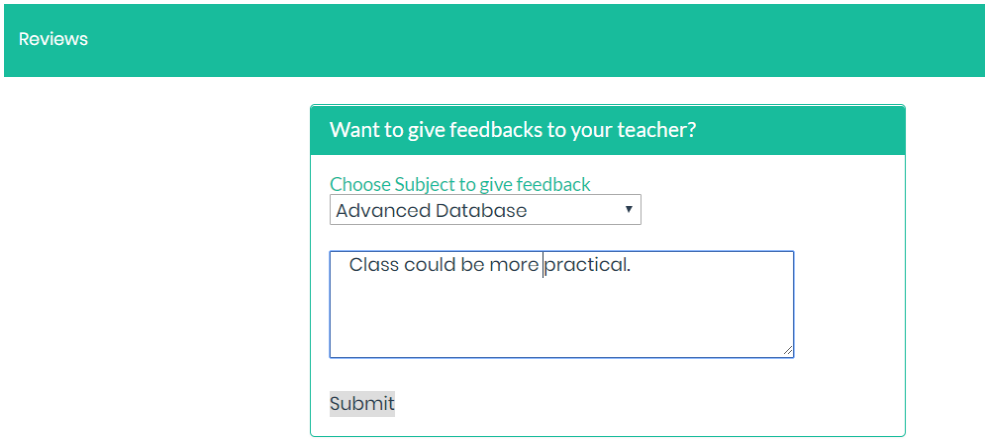


Figure 19: Giving feedbacks

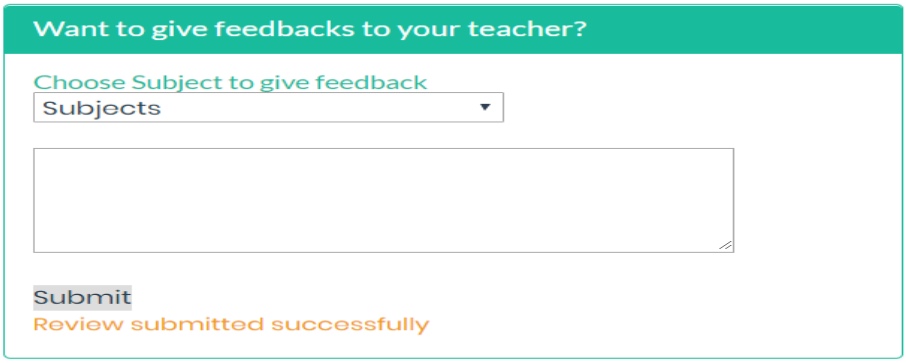


Figure 20: Response for feedback submission

3.5.2 System Testing

System Testing is the testing of a complete and fully integrated software product. Usually software is only one element of a larger computer-based system. Ultimately,

software is interfaced with other software/hardware systems. System Testing is a series of different tests whose sole purpose is to exercise the full computer-based system [49].

Finally, combining all the unit test cases the system was tested from beginning to the end.

3.6 Implementation

The implementation phase involves putting the project plan into action. It is the phase where you and your project team do the project work to produce the deliverables.

System implementation ensures that the system meets the quality standards. It is the test program that exercises the complete system in its actual environment to determine its capabilities and limitations which also demonstrates that the system is functionally operative and is compatible with the other subsystems and supporting elements required for its operational deployment. The implementation phase is where you and your project team do the project work to produce the deliverables i.e. anything your project delivers. The deliverables for your project include all the products or services that you and your team are performing for the client, customer, or sponsor, including all the project management documents that you put together [50].

Hence, implementation is the carrying out, execution, or practice of a plan, a method, or any design, idea, model, specification, standard or policy for doing something. As such, implementation is the action that must follow any preliminary thinking for something to happen [51].

The implementation of this project can be done in schools and colleges where assignments are given to the student in regular basis. This can be implemented in almost all the schools and colleges initiating from few in numbers. If provided proper hosting this project can take a wide popularity.

CHAPTER 4: RESULT ANALYSIS

4.1 Screenshots

4.1.1 Login

```
if (userid.equals(rs.getString("uname")) &&
pwd.equals(rs.getString("passwd"))) {

session.setAttribute("userid", userid);

session.setAttribute("user_id",rs.getString("id") );

}else {

      session.invalidate();

      request.setAttribute("errorMessage", "Invalid username or
      password");

}
```

Figure 21: Login Page

The figure above shows the login page after the user opens the page. The login page has two options for member login, one for the teacher and one for the student. Here, the login for the student is shown. After the login the user goes to the main page.

4.1.2 Upload notes and assignments

```
                    if( fileName.lastIndexOf("\\") >= 0 ) {
                    file = new File( filePath +
                    fileName.substring( fileName.lastIndexOf("\\"))) ;
                    } else {
                     file = new File( filePath +
                     fileName.substring(fileName.lastIndexOf("\\")+1))
;
                     }
                    fi.write( file ) ;
```

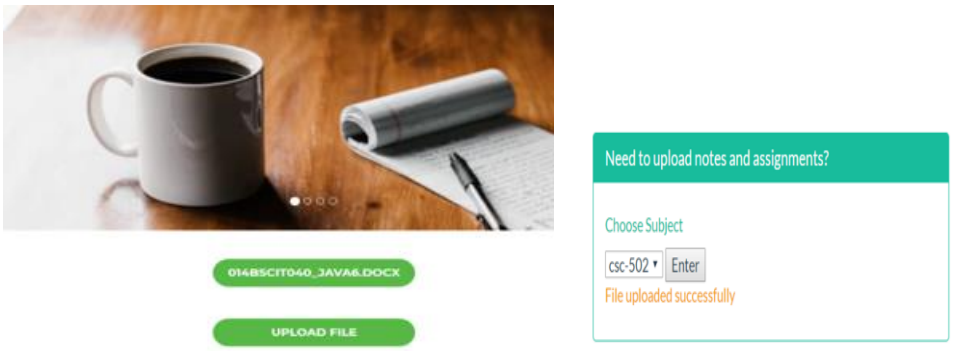


Figure 22: Uploading Assignments

The above figure is the figure of page after the user chooses the option to upload the for the particular subject. After uplaoding the file a message will be displayed as shown above. Eventually, the file will be saved in the database from where another user can retrieve.

4.1.3 Search and download assignments

```
ResultSet rs;

rs = st.executeQuery("select file, subject_id from assignment a
where a.subject_id='" + subid + "' and a.student_id='" + user +
"'")
```

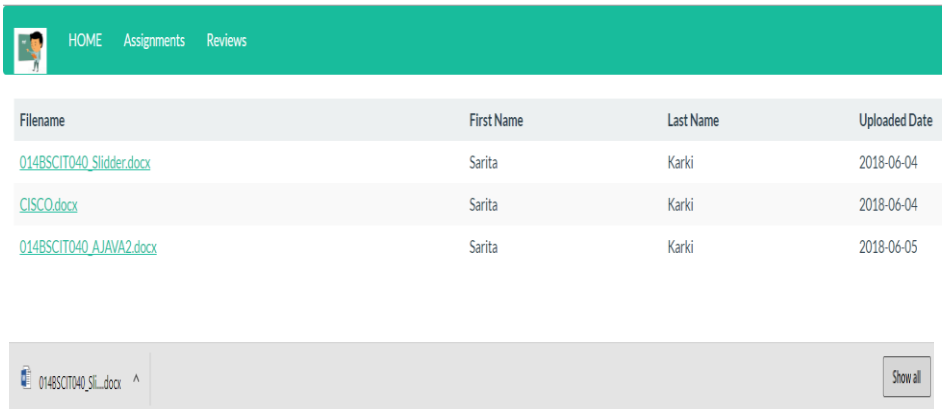


Figure 23: Viewing and downloading assignments

The above figure shows the page which is loaded after the user chooses to view the assignments of selected subject. After viewing the list, the users can download it as per their need.

4.1.4 Provide Feedbacks

```
int i = st.executeUpdate("insert into
review(subject_id,message) values ('" + subid + "','" + remarks
+ "')");

if (i > 0) {

response.sendRedirect("remarks.jsp?success=success");

} else {

response.sendRedirect("remarks.jsp?notsuccess=fail")
```

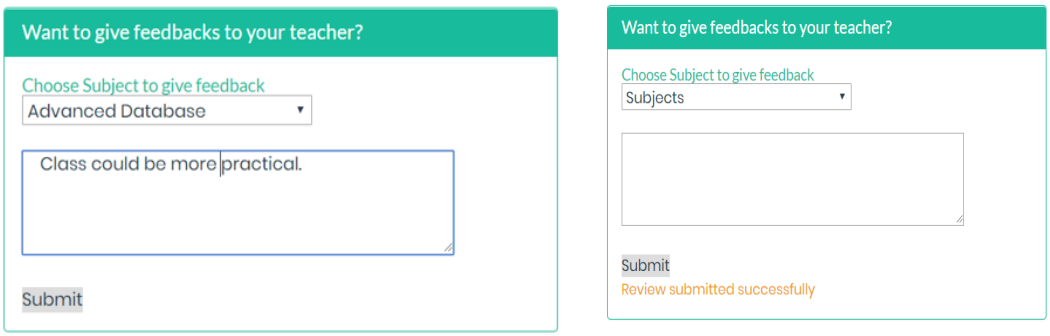


Figure 24: Submitting Feedbacks

The figure above shows the page when the student chooses the subject to provide feedbacks. After submitting the feedbacks, a message will be shown as above. Eventually, the remarks will be stored in the database which the teacher will retrieve.

4.2 Critical Analysis

Information and Communication Technology has made impacts in every aspect of human life, the only difference is the level of impact it has made. Humans in the developed countries have started being dependent on ICT for almost everything, even for buying groceries. But the scenario is quite different in developing countries like ours where technology is gradually growing and people are slowly adapting to it. The major problem is evident as: technology for the daily life operations being concentrated in only certain sectors only. The main hindrance seen among for adapting to technology has been the availability and awareness of the software programs that can be developed and had been already developed. People are unknown as to whether these type of technological services exist or not.

In context of the Nepalese society, the acknowledgement of technology has been growing. However, the growth has not been even in all aspects of human lives. Fields such as education sectors are slowly adapting the technology but the pace is slower. Only few initiatives have been taken in this field and the educational institutions are still not sure to utilize the services provided by them. A large number of people acknowledging technology, in contrast, use the basic web-service as Gmail nowadays but not everytime. In this scenario, **गुरुशिष्य** – **"A**

Project for Easier Assignment Management" is seen as an initiative to incorporate technology in the field of education in more effective way. This project primarily targets the assignment management service which is one of the most important aspect of schools and colleges. At the present context, only the few schools and colleges have been seen using the services of internet to manage the notes and assignments. The technology-incorporated assignment submission service to such scenario becomes an assumption and unviable in the schools and colleges of remote area of Nepal.

This project was developed to help the teacher and students for the easier assignment provision and submission respectively. In the modern era of technology where people choose everything software-based services, this application would provide a platform where both the student and teacher can use the technology to share, upload and download the assignments and notes. Today in this era hard copies are less used. It is hectic for teacher to handle the assignments in the form of papers. So, this application lets the teacher to download and view the assignments and check the deadlines as well.

This project will help a lot of students, teachers, administrations and as a whole schools and colleges to establish a managed assignment submission and acceptance service. This project if gets a wider popularity will be brought into implementation in all the schools and colleges as it saves the time money and energy of every individual related to the teaching and learning process. It will also make the schedule of students less hectic as they can view the deadlines in the calendar.

During the research phase the author went through different papers and journal articles. The research was carried out extensively to get as more knowledge as possible. From, the research, the author gathered a lot of information and knowledge regarding the assignment management under the knowledge management and the tools for the development of the app. From, the research, the author concluded that software-based assignment and knowledge management is an important issue in the schools and colleges of Nepal and thus this web-based technology could play a major role in bringing about a change.

For the project, author researched on the work done by other developers in the field of knowledge management and online assignment management system(AMS) in Nepal and around the world. Authors found many developers who are working actively to develop the app in the countries like USA, UK, India have developed such apps. In our country Nepal few have been developed but has not been in intense use and they do not use the web-based technology.

As per the system, it was developed for web app users as web apps are being used in large number nowadays. Upload and download of the files is easier via the computers than mobile. With the large screen on computers users can view the files easily and clearly. Likewise, web app can give you an easier user interface with the distinct view. So, web app for this project was chosen. For web app development the IDEs are: Eclipse, NetBeans, IntelliJ etc. Being familiar with the IDE NetBeans was used to develop the app.

Comparing between Eclipse and NetBeans, the author found that Eclipse's functionality comes from plugins. Features like Mobile application SDK's, Rich Internet applications, and Architectural driven apps can be developed using plugins mostly. On the other hand, NetBeans has many projects and is a tool-based IDE. It incorporates many platforms using tooling support. Thus, making it less scattered. It also has a strong support when you are developing MVC based application in Java. Servlet/JSP development is fairly very simple compared to Eclipse, especially in the field of deployment and debugging. NetBeans comes with in-built support for and SQL, MySQL and Oracle drivers plus it includes some others too. So, this makes things easy for developers. However, Eclipse has JDBC driver support – but it takes some serious time to configure the connection and takes higher amount of RAM space with high CPU speed to function properly.

Hence, NetBeans, an IDE for web app was selected to develop the web application. The user interface was designed using bootstrap via Java Server Pages(JSP). The authors wanted to enhance their knowledge in java also. So, java as well as JSP programming platforms were used to write the business logic.

Xampp was used as a web server solution stack as it makes it extremely easy for developers to create a local web server for testing and deployment purposes. Everything needed to set up a web server – server application (Apache), database (MySQL), and scripting language (JAVA) is included in a single extractable file. MySQL database was used as it is easy to use, has fast performance and is inexpensive. JAVA was used for server-side scripting as it is renowned for its Write One, Run Anywhere (WORA) philosophy, and indeed Java can be run on all major Web servers and all major operating systems. Java Web applications can also be bundled up into a standard Web Application Archive (.WAR) files that can then be installed on any Java-enabled Web server, no matter the platform.

From a developer's perspective, authors have tried to develop a platform with easy user interface and tried to keep it simple and attractive. The author has tried to do strong backend coding to validate data and files and uphold possible errors and bugs. Also, databases are managed in such a way that the required data will be generated fast. One of the limitations of the web app is that it requires internet access to be dynamic among all the users and data to be stored in the server. Similarly, not all the users will use the desktop every time and everywhere.

4.3 Limitation and Future Enhancement

4.3.1 Limitation

- Unable to send the notification to the users about new files being uploaded.
- Unable to upload the file to the server without internet access.
- Unable to warn student few days before the deadline.
- There is chance of uploading the wrong file by user

4.3.2 Future Enhancement

- Sending notification to the user about the upload of new file
- Warning the students about the deadlines
- Making the app more dynamic

CONCLUSION

This project emphasizes on maintaining a well-organized assignment management system for both the teachers and students. The main objective of the project is to organize the assignments, notes and files easily via the use of web app without using hard copies. **गुरुशिष्य – "A Project for Easier Assignment Management"** was developed to help teachers and students to be connected using the same platform.

This project wouldn't have been accomplished if various series of research were not conducted at various level. To get more idea on the topic, author started to research on the different related projects. The research included of searching for both the advanced as well as less advanced project than this. The research gave me a broader knowledge on how I could carry out this project more effectively. Thus, the author came up with the idea of developing this app.

A lot of effort and time has been used to research about the tools to be used for the development of the system. And only the tools that best fit the requirements if this system have been selected. The project was made for the web-based devices like desktops, considering that it is best suited for this kind of app. The project uses bootstrap for the templates, JavaScript as the client-side validation, jQuery for simplifying the work of HTML and JSP and Java for the server-side scripting. MySQL has been used as the database that stores all the information. Ant browser like Mozilla, Chrome can be used for this web app.

Finally, this project has been accomplished after months of hard work and research. The result of all these hard work and patience has now led to a properly functioning system that would be helpful to manage a well-organized classroom. Therefore, this application helps the student be punctual and teacher be more enthusiastic in teaching.

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