E-LEARNING SYSTEM

A PROJECT REPORT
for
Project (KCA451)
Session (2023-24)

Submitted by

Ankita Pandey
(2200290140030)
Aayushi Singh
(2200290140003)

Submitted in partial fulfillment of the
Requirements for the Degree of

MASTER OF COMPUTER APPLICATION

Under the Supervision of
Mr. Praveen Kumar Gupta
Assistant Professor

Submitted to

DEPARTMENT OF COMPUTER APPLICATIONS
KIET Group of Institutions, Ghaziabad
Uttar Pradesh-201206

(JUNE 2024)

DECLARATION

I hereby declare that the work presented in this report entitled “E-learning System", was carried out by me. I have not submitted the matter embodied in this report for the award of any other degree or diploma of any other University or Institute. I have given due credit to the original authors/sources for all the words, ideas, diagrams, graphics, computer programs, experiments, results, that are not my original contribution. I have used quotation marks to identify verbatim sentences and given credit to the original authors/sources. I affirm that no portion of my work is plagiarized, and the experiments and results reported in the report are not manipulated. In the event of a complaint of plagiarism and the manipulation of the experiments and results, I shall be fully responsible and answerable.

Aayushi Singh (2200290140003)
Ankita Pandey (2200290140030)
Branch: MCA

CERTIFICATE

Certified that **Aayushi Singh 2200290140003, Ankita Pandey 2200290140030** has/ have carried out the project work having "**Elearning System**" (**Major Project-KCA353**) for **Master of Computer Application** from Dr. A.P.J. Abdul Kalam Technical University (AKTU) (formerly UPTU), Lucknow under my supervision. The project report embodies original work, and studies are carried out by the student himself/herself and the contents of the project report do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University/Institution.

Date:

Aayushi Singh 2200290140003

Ankita Pandey 2200290140030

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Date:

Mr. Praveen Kumar Gupta
Assistant professor
Department of Computer Applications
KIET Group of Institutions, Ghaziabad

Dr. Arun Kumar Tripathi
Head of Department
Department of Computer Applications
KIET Group of Institutions, Ghaziabad

E-LEARNING SYSTEM

Ankita Pandey (2200290140030)

Aayushi Singh (2200290140003)

ABSTRACT

The aim of this project is to provide an online learning system with a smooth and well-organized Graphical User Interface easy to understand for the user form first glance. The project has been planned to be having the view of distributed architecture, with centralized storage of the database.

This portal will enhance the quality of learning. Improve user accessibility and time flexibility to engage learners in the learning process. It offers online content that can be delivered for the learner at anywhere, anytime through a wide range of e-learning solution.

Keywords: Improve user accessibility, learning process, well- organized GUI

ACKNOWLEDGEMENTS

Success in life is never attained single-handedly. My deepest gratitude goes to my project supervisor, **Mr. Praveen Kumar Gupta** for his/ her guidance, help, and encouragement throughout my project work. Their enlightening ideas, comments, and suggestions.

Words are not enough to express my gratitude to Dr. Arun Kumar Tripathi, Professor and Head, Department of Computer Applications, for his insightful comments and administrative help on various occasions.

Fortunately, I have many understanding friends, who have helped me a lot on many critical conditions.

Finally, my sincere thanks go to my family members and all those who have directly and indirectly provided me with moral support and other kind of help. Without their support, completion of this work would not have been possible in time. They keep my life filled with enjoyment and happiness.

Aayushi Singh
Ankita Pandey

Table of Content

CHAPTER 1

INTRODUCTION

E-Learning or E-Education as the name suggests offers flexibility of studying via the internet, whenever and wherever you wish. Online tutorial is flexible and convenient studying which will suit your learning habits. It supplements your classroom study. You can set your own weekly study schedule and excel in your class. Class room study gives you the knowledge and training to improve your examination performance and increase your chances for higher marks and grades. The traditional school cannot be done away with, but the virtual classroom is a significant development in today's educational scenario. Schools and educational institutes are using the online model to educate and train students.

An E-Learning can help teaching and learning in many aspects. Firstly, it can help teachers demonstrating abstract ideas more clearly, like in Chemistry lessons, the compositions of bonds and atoms can be shown in large animations rather than just looking small pictures in textbooks. E-Learning provides a perfect environment for online training and gives a feel of being in the classroom itself. This solution can help you in your quest to provide effective training at low cost to your employees. It integrates the best learning practices with the power of Internet to provide a dynamic learning platform to the learner.

There's very little doubt that when compared to the conventional means of training, e-learning has innumerable advantages. The most important of which are savings in terms of time and cost. The mantra is: **"Getting the Right Information, To the Right User, At the Right Time".** It has all the advantages of the conventional e-learning plus it's live. It gives you the power to learn live via the Internet. With this you can increase national as well as international student enrolments, improve their participation and enhance performance quotients. Basically, it allows you to add live, real-time interaction to distance learning

1.1 BACKGROUND

In the background of E-Learning sometimes it is not possible for all to be in the campus and then keep interacting with the studies. Then the concept of the "e-Learning" takes place, so that although being elsewhere a person can easily keep processing his studies.

E-Learning refers to instruction in a learning environment where teacher and student are separated by time or space, or both, and the teacher provides course content through course management applications, multimedia resources, the Internet, videoconferencing, etc. Students receive the content and communicate with the teacher via the same technologies. This project provides the way to deal with this type of system of study. It will admit a student, give lectures, give assignments & finally generate reports.

1.1.1 System Objective

Today's world is computer world because most of work is doing with the help of computer. Dependency on computer is behind the few reasons. We cannot easily manage to store large number of data or information single handle. If we will be need some information or data in urgency then we cannot manage in manually these works are very difficult if we cannot use computer.

1.1.2 System Context:

This section clearly depicts the environment and boundaries of the E-Learning and the entities with which it interacts. It helps us see how the system fits into the existing scheme of things. What the system will do by itself and what it expects other entities to do is clearly delineated. The system context of an e-learning system refers to the environment in which the system operates, including its interactions with external entities, dependencies, and interfaces. Here's a breakdown of the system context for an e-learning platform Understanding the system context is crucial for designing, developing, and maintaining an e-learning platform that meets the needs of its users and seamlessly integrates with external systems and services. It helps identify dependencies, interface requirements, and integration points necessary for the effective functioning of the system within its broader ecosystem.

1.1.3 Functional Requirement

The functional requirement of project is making the study process easy in cooperative societies. Sometimes it is not possible for all to be in the campus and then keep interacting with the studies. Then the concept of the “e-Learning” takes place, so that although being elsewhere a person can easily keep processing his studies. This project provides the way to deal with this type of system of study. It will admit a student, give lectures, give assignments, chatting & finally generate reports

1. **User Authentication and Authorization**:
    - User registration and login functionality for students, instructors, and administrators.
    - Role-based access control to manage permissions and access levels.
2. **Course Management:**
    - Creation, editing, and organization of courses.
    - Uploading course materials such as documents, presentations, videos, etc.
    - Assigning instructors and managing enrollment.
3. **Content Delivery:**
    - Presentation of course content in various formats (text, video, audio, interactive modules, etc.).
    - Support for multimedia content integration.
    - Content versioning and update management.
4. **Mobile Compatibility:**
    - Responsive design to ensure accessibility on various devices.
    - Mobile apps for convenient access on smartphones and tablets.

1.1.4 Non-Functional Requirement

Non-functional requirements define the qualities or attributes that characterize how the system operates, rather than specific features or functionalities. These requirements are essential for ensuring the performance, reliability, security, and usability of the e-learning system. Here are some common non-functional requirements for an e-learning platform:

1. **Performance:**
    - **Response Time:** Define acceptable response times for actions such as loading course materials, submitting assignments, or accessing assessments.
    - **Scalability:** Ensure the system can handle increasing numbers of users, courses, and concurrent interactions without significant degradation in performance.
2. **Reliability:**
    - **Availability:** Specify the system's uptime requirements, including planned maintenance windows and acceptable downtime for updates or maintenance.
3. **Security:**
    - **Authentication and Authorization:** Ensure secure user authentication mechanisms and role-based access control to prevent unauthorized access to sensitive information.
    - **Data Encryption:** Encrypt sensitive data such as user credentials, personal information, and assessment results to protect against unauthorized interception or access.
4. **Performance Efficiency:**
    - **Resource Utilization:** Optimize resource utilization (CPU, memory, storage) to minimize operational costs and ensure efficient use of hardware resources.

Addressing these non-functional requirements alongside functional requirements is essential for delivering an e-learning system that meets the needs of users, administrators, and stakeholders while providing a reliable, secure, and efficient learning experience.

1.2 OBJECTIVE

Sometimes it is not possible for all to be in the campus and then keep interacting with the studies. Then the concept of the "e-Learning" takes place, so that although being elsewhere a person can easily keep processing his studies.

E-Learning refers to instruction in a learning environment where teacher and student are separated by time or space, or both, and the teacher provides course content through course management applications, multimedia resources, the Internet, videoconferencing, etc. Students receive the content and communicate with the teacher via the same technologies. This project provides the way to deal with this type of system of study. It will admit a student, give lectures, give assignments, take exams & finally generate reports. The main objectives behind developing this website are:-

- To provide an easy approach for those students who wants to get higher education.
- Students suffering from financial problems can get admission in their interested course by paying small amounts.
- Any user having little knowledge of computers can access its facilities.
- Since we are living in a computer era, so it will introduce a way to connect with new technologies through internet.
  It provides access of new opportunities in work, learning and socializing.

1.3 PURPOSE

Purpose of this project is to provide a platform for the distance learning so that the problems concerning in the system of the regular learning can be handle effectively. It will provide a way for connecting student and faculty at a virtual bridge where they can interact together. It is the way to connect student with a virtual environment of studying via virtual threads.

1.4 SCOPE

Scope of this project is very wide. It will enhance the capabilities of the learning via distance learning concept. It will help those students who are unable to study via regular learning. They will be able to study without interacting with the teacher directly.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

A literature review is a critical analysis of published work. The purpose of literature review is to develop a thorough understanding and insight into the previous research works that relates to the present study so it helps to gain deeper insight about the subject, to develop instrument or data collection and to find out certain data that could be applicable in the interpretation and conclusion of the study. This chapter includes review of literature that is abstracted through electronic site such as HINARI, pub med, Google, Google scholar, research gate and non-electronic i.e. books, reports and news which supports to the conceptual framework of the research study. It is concerned with the review of the students' satisfaction regarding e-learning classes during lockdown.

2.2 Review of the literature

Globally, during COVID-19 pandemic many countries have closed down schools and universities. Teaching is moving e-learning on an untested and unprecedented scale. Students' assessments are also moving e-learning. Educators, faculty, students are doing their part to support each other. And these disruptions are a time to rethink and reflect on the education sector. Technology has a key role in educating the future generations (Shenoy et al., 2020).The distance education was first introduced by Open University in Great Britain which offers a college degree through distance education. The university uses all possible use of new technology to deliver learning to the students (Singh, et al., 2020). In Nepal, learning process has been made more flexible and some of the flexible approaches are e-learning or distance learning. The two most leading universities of Nepal i.e., Tribhuvan University and Kathmandu University are offering these approaches of learning these days for bachelor degree and master degree (Shakya et al, 2017). Ascough suggested that e-learning education has

the following features: (a) it provides a learning experience different than in the traditional classroom because learners are different, (b) the communication is via computer and World Wide Web, (c) participation in classroom by learners are different, (d) the social dynamic of the learning environment is changed, and (e) discrimination and prejudice is minimized (Yang Candidate & Cornelious, n.d.) whereas remote teaching is a form of course delivery in which courses originally designed for face-to-face delivery are modified and delivered e-learning to meet an emergency situations. The shift from face-to-face to e-learning /teaching was entirely new experience and the shifting process was so abrupt, no one was adequately prepared for it, So, it's worth investigating student's e-learning learning experiences and address some of the underlying challenges in e-learning learning during this pandemic situation (Butucha, 2020). In Minnesota, U.S, during the 2021 semester, many undergraduate students have been listening to lectures from their bedrooms while their instructors struggle to share their screens on Zoom. Class discussions are being held in randomized breakout rooms where sometimes not a single student turns on their camera or microphone. Hands-on interactive science labs have been turned into passive video-viewing sessions. Students may go through an entire school day without leaving their beds or having a single conversation. The 2020–2021 academic year has presented challenges to students and professors alike (Prichard, et al., 2021). In India research study among Agricultural Student's revealed that majority of the respondents (70%) were ready to opt for online classes to manage the curriculum during this pandemic. Majority of the students preferred to use smart phone for online learning. Students prefer recorded classes with quiz at the end of each class to improve the effectiveness of learning. The students stated that flexibility and convenience of online classes makes it attractive option, whereas broadband connectivity issues in rural areas makes it a challenge for students to make use of online learning initiatives (Muthuprasad, Aiswarya, Aditya & Jha, 2020). In China, it was found that 36.5% of students and 61.1% of teachers were satisfied with the e-learning education. The most influential barrier for students was the severity of the COVID-19 situation and the most influential facilitating factor for students was a well-accomplished course assignment. The study concluded that to improve the e-learning education outcome, medical schools should promote the facilitating factors and cope with the barriers, by providing support for students and teaching faculties (Li et al., 2021). In India, research study among medical students revealed the negative impact of e-learning on students' communication and interpersonal relationships. The most common depression and anxiety symptoms, dissatisfaction with academic performance were among students who indicated a decrease in academic performance during e-learning (Bolatov et al., 2020). In Nepal, the COVID-19 school closure is likely to increase

drop-out rates. It is estimated the situation will be worse in rural areas. To reiterate, giving equitable access to e-learning for all students in Nepal is a huge challenge. Also in remote learning, teachers will have limited time to cover several topics in their curriculum and students might feel pressured to learn so much within a short time. Consequently, there might be a danger that a priority is placed only on covering the courses rather than on developing skills in students and preparing them for a better future (Dawadi et al., 2020). The study on "Impact of Covid-19 on University Education, Nepal: Review Paper" revealed with majority of world's student population out of colleges and university due to COVID-19 mitigation measures, the pandemic has resulted in a rapid shift to e-learning education. While these are uncertain times, universities can continuously strive to deliver high quality teaching and consistent communication to students. To do so, it's imperative that institutions listen to students' needs and concerns and leverage the latest technological tools (K.C., 2020). In a randomized trial among 3,700 households with children in public school across 10 local governments in seven provinces in Nepal, showed that over 40% of households did not have a single member with access to the internet(Radhakrishnan et al., 2021). The study on Nursing Students showed that mobile was the most commonly (51.9%) used gadget for attending e-learning class. One third of the students (35.3%) had no access to static internet and 4.5% of them did not have internet at their home. Majority of the students (91.7%) felt that e-learning classes should be continued during this pandemic. Nearly two third of the respondents (63.2%) were satisfied from the e-learning classes. Overall, 54.1% had negative perception towards e-learning classes (Koirala et al., 2020). The study among the BDS students of KU revealed 89% of the students had never attended any e-learning classes before e-learning education due to COVID-19 pandemic. About 77% agreed that the e-learning class is distracting and 57.5% used smart phone for seeking e-learning class and medium most frequently used was Zoom platform. About 70% students could ask questions, communicate & receive response during e-learning class and 55.4%s students disagreed that e-learning classes are more effective (Gupta et al., 2020). In far western region of Nepal, study regarding implementing e-learning revealed major challenges for success of e-learning is the lack the proper technical infrastructure, tools and technologies (25%) and around 19% of the respondent revealed the fact that insufficient technical skill among the teachers were a major hurdle of e-learning success. Twenty eight percent have pin pointed high implementation cost, 16% said that there was a lack of proper vision on e-learning concept among different stake holders of education sectors and 12% claim that load shedding and electricity had been a major challenge for successful implementation of e-learning (Sharma & Prashad Bhatta, 2018).

2.3 Summary of literature Review

E-learning and teaching process has become more prevalent due to COVID- 19 pandemic. However, many were unsatisfied because of various challenging factors for success of online learning. These includes anxiety due to severity of COVID - 19 situation, no access to internet, lack of reliable internet connectivity, lack of resources, power failure, lack of skills in handling technology ,quality of teaching, lack of co-curricular activities, learning in equalities due to digital dividend. Also, online learning has significant impact on mental health of the students. Nepal has placed education at the center of its COVID 19 emergency response and has pursed remote and e-learning opportunities to offset school closure, different research studies depicted remote learning has negative learning outcomes among students. Students' satisfaction is crucial for a successful and effective learning process. There is a growing body of literature showing that satisfaction has a positive relationship with student engagement and academic performance. Students' satisfaction has been linked to better learning outcomes. E-learners' satisfaction has a significant impact on the success of the e-learning process and leads to improving the quality of the e-learning system. Evidences show that e-learning can play the role of catalyst for active learning, enhancing creativity, motivation for learning and updating existing body of knowledge and communication (Sharma et al., 2020). But in developing countries like Nepal, technological, education/literacy background and socioeconomic challenges exist. These challenges might act as a hindrance to the E-learning process and student's satisfaction (Subedi et al.,2020).With the increase in use of online modalities during COVID-19, it is necessary to assess their effectiveness with regards to teaching which will help identify the required changes on priority basis to make it more practical and worthwhile. In context of our country, during this pandemic situation, online learning is the only available option to provide continuity to educational process. As student satisfaction is used as one of the key elements to evaluate online courses, and to improve student engagement and academic performance and learning outcomes student satisfaction regarding e-learning learning is utmost important and very few studies on satisfaction regarding online classes during COVID-19 pandemic has been found. Hence, to fulfil this gap researcher is interested to conduct this study.

CHAPTER 3

FEASIBILITY ANALYSIS

3.1 Introduction

All projects are feasible given unlimited resources and infinite time! Unfortunately, the development of computer based system is more likely to be plagued by a scarcity of resources and difficult delivery dates. It is both necessary and prudent to evaluate the feasibility of the project at the earliest possible time. Months or years of effort, Money loss and untold professional embarrassment can be averted I few better understand the project at its study time.

This type of study determines if an application can and should be developed. Once it has been determining that, application is feasible. After that analyst can go ahead and prepares the project specification, which finalizes project requirements. Feasibility studies are undertaken within tight time constraints.

1. **Technical Feasibility**
2. **Operational Feasibility**
3. **Economic Feasibility**
4. **Legal Feasibility**

3.2 Technical Feasibility

As we know the technical feasibility is concerned with specifying equipment and software that will successfully satisfy the user requirement. The technical needs of the system may vary considerably, but might include:

- The facility to produce outputs of advertisements, shopping and mailing in a given time for ease of use.

- Response time under certain condition is minimal.
- Ability to process a certain volume of transaction at a particular speed.
- Facility to communicate data to distinct location.

In examining the technical feasibility, configuration of the system is given more importance than the actual make of hardware. The configuration should give the complete picture about the system's requirements- how many workstations are required, how these units are interconnected so that they could operate and communicate smoothly.

3.3 Operational Feasibility

Proposed projects are beneficial only if they can be turned into information system that will meet the financial management requirements of the business/organization. This test of feasibility asks if the system will work when it developed and installed. Are there major barriers to implementation?

Some of the important questions that are useful to test the operational feasibility of a project are given below:

- Is there sufficient support for the project from the implementation? From user? If the present system is well liked and used to the extent that persons will not be able to see reasons for change, there may be resistance.
- Are current business methods acceptable to the user? If they are not, user may welcome a change that will bring about a more operational and useful system
- Have the user been involved in the planning and development of the_Project? If they are involved at the earliest stage of project development, the chances of resistance can be possibly reduced.
- Will the proposed system cause harm? Will it produce poorer result in any case or area?
- Will the performance of staff member fall down after implementation? Issue that
- Appears to be quite minor at the early stage can grow into major problem after Implementation.

3.4 Economical Feasibility

Economic analysis is the most frequently used technique for evaluating the effectiveness of the proposed system. More commonly known as cost/benefits analysis, the procedure is to

determine the benefits and savings that are expected from the purposed system and compared with costs.

If benefits outweigh cost, a decision is taken to design and implement the system. Otherwise, further justification or alternative of the proposed system will have to be made if it has a chance of being approved As already mentioned that the company has to just pay the developed software cost and not other investment is needed at the time of implementation of the new system as the preliminary requirements already exist in the company.

3.5 Legal Feasibility

In the legal feasibility is necessary to check that the software we are going to develop is legally correct which means that the ideas which we have taken for the proposed system will be legally implemented or not so , it is also an important step in feasibility study.

3.6 Problem Specification

The definition of our problem lies in manual system and a fully automated system.

3.6.1 Manual System

The system is very time consuming and lazy. This system is more prone to error and sometimes the approach to various problems is unstructured.

3.6.2 Technical System

With the advent of latest technology if we do not update our system then our business result in losses gradually with time. The technical system contains the tools of latest trend i.e. computers, printers, FAX, Internet etc the system with the technology are very fast, accurate, user friendly and reliable.

3.6.3 Need of e-Learning

Sometimes it is not possible for all to be in the campus and then keep interacting with the studies. Then the concept of the “e-Learning” takes place, so that although being elsewhere a person can easily keep processing his studies. E-Learning refers to instruction in a learning environment where teacher and student are separated by time or space, or both, and the teacher provides course content through course management applications, multimedia resources, the Internet, videoconferencing, etc. Students receive the content and communicate with the teacher via the same technologies. This project provides the way to deal with this type of system

of study. It will admit a student, give lectures, give assignments, chatting & finally generate reports.

3.7 The Proposed System

There are mainly three modules in the project-

i. Admin Module
ii. Faculty Module
iii. Student Module

Admin Module :-

- Manage System Info
- Manage Academic Year List
- Manage Department List
- Manage Course List
- Manage Subject List
- Manage Faculty List
- Manage Faculty Subject Loads
- Manage Student List
- Manage Class List
- Manage Account Details

Faculty Module :-

- Login/Logout
- View My Class List
- View My Lesson Created
- Manage Lesson
- Manage Account Details

Student Module :-

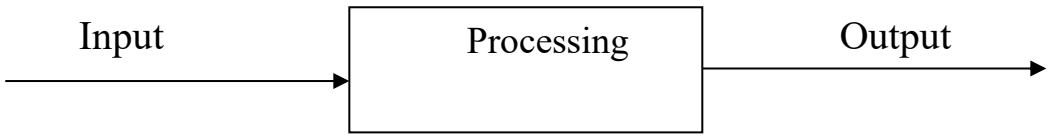
- Login/Logout
- View My Subject List
- View My Lesson per Subject
- Manage Account Details

CHAPTER 4

SYSTEM DESIGN

4.1 DEFINING A SYSTEM

Collection of component , which are interconnected, and work together to realize some objective, from a system. There are three components in every system, namely input, processing and output



4.1.1 SYSTEM DEVELOPMENT LIFE CYCLE

The **Systems development life cycle (SDLC)**, or **Software development process** in systems engineering, information systems and software engineering, is a process of creating or altering information systems, and the models and methodologies that people use to develop these systems. In software engineering, the SDLC concept underpins many kinds of software development methodologies. These methodologies form the framework for planning and controlling the creation of an information system the software development process.

Broadly, following are the different activities to be considered while defining the system development life cycle for the said project:

- Problem Definition
- System Analysis
- Study of existing system
- Drawback of the existing system

- Proposed system
- System Requirement study
- Data flow analysis
- Feasibility study
- System design
- Input Design (Database & Forms)
- Updating
- Query /Report design
- Administration
- Testing
- Implementation
- Maintenance

4.1.2 SYSTEM ANALYSIS

Systems analysis is the study of sets of interacting entities, including computer systems analysis. This field is closely related to requirements analysis or operations research. It is also "an explicit formal inquiry carried out to help someone (referred to as the decision maker) identify a better course of action and make a better decision than he might otherwise have made.

System development can generally be thought of having two major components: systems analysis and systems design. In System Analysis more emphasis is given to understanding the details of an existing system or a proposed one and then deciding whether the proposed system is desirable or not and whether the existing system needs improvements. Thus, system analysis is the process of investigating a system, identifying problems, and using the information to recommend improvements to the system.

4.1.3 SYSTEM DESIGN

Systems design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. One could see it as the application of systems theory to product development. There is some overlap with the disciplines of systems analysis, systems architecture and systems engineering. If the broader topic of product development "blends the perspective of marketing, design, and manufacturing into a single approach to product development," then design is the act of taking the marketing information and creating the design of the product to be manufactured. Systems design is therefore the

process of defining and developing systems to satisfy specified requirements of the user. Until the 1990s systems design had a crucial and respected role in the data processing industry. In the 1990s standardization of hardware and software resulted in the ability to build modular systems. The increasing importance of software running on generic platforms has enhanced the discipline of software engineering.

4.2 Structure System Requirements

4.2.1 ER Diagram

The entity-relationship model or entity-relationship diagram (ERD) is a data model or diagram for high-level descriptions of conceptual data model, and it provides a graphical notation for representing such data models in the form of entity-relationship diagrams. Such models are typically used in the first stage of information-system design; they are used, for example, to describe information needs and/or the type of information that is to be stored in the database during the requirement analysis. The data modelling technique, however, can be used to describe any ontology (i.e. an overview and classifications of used terms and their relationships) for a certain universe of discourse (i.e. area of interest).

In the case of the design of an information system that is based on a database, the conceptual data model is, at a later stage (usually called logical design), mapped to a logical data model, such as the relational model; this in turn is mapped to a physical model during physical design.

There are a number of conventions for entity-relationship diagrams (ERDs). The classical notation is described in the remainder of this article, and mainly relates to conceptual modeling. There are a range of notations more typically employed in logical and physical database design.

Here's an explanation of the symbols commonly used in ER diagrams:

1. **Entity**: Represented by a rectangle, an entity is a real-world object or concept with attributes. Each entity typically corresponds to a table in a database.
2. **Attribute:** Represented by an oval or ellipse inside an entity rectangle, an attribute is a property or characteristic of an entity. Attributes describe the entity's properties, and they are listed inside the entity rectangle.
3. **Primary Key**: Often denoted by underlining an attribute within an entity, the primary key uniquely identifies each record in the entity. It ensures that each record in the table is unique.
4. **Composite Attribute**: An attribute that can be further subdivided into smaller parts,

which represent more basic attributes with independent meanings. These are typically shown with a smaller oval shape inside the main oval representing the composite attribute.

5. **Multivalued Attribute:** Denoted by a double oval shape, a multivalued attribute can hold multiple values for a single entity. For example, a "Skills" attribute for an employee entity might be multivalued if an employee can have multiple skills.
6. **Derived Attribute**: Represented by a dashed oval shape, a derived attribute is one whose value can be calculated from other attributes. It's not stored directly but derived through a formula or calculation.
7. **Relationship**: Represented by a diamond shape connecting two entities, a relationship illustrates how entities are related to each other. It defines how data is connected and how they interact.
8. **Cardinality:** This describes the maximum number of times an instance in one entity can be associated with instances in another entity. It's often expressed as "one" or "many" and shown near the relationship line.
9. **Weak Entity:** Represented by a double rectangle, a weak entity depends on another entity for its existence. It does not have a primary key attribute of its own and is identified by a combination of its attributes along with the primary key of another related entity.
10. **Identifying Relationship:** A relationship in which the primary key of the related weak entity includes the primary key of the parent entity. It's represented by a solid line connecting the weak entity to its parent entity.
11. **ISA Relationship**: Represented by a triangle, an ISA (is a) relationship indicates a specialization/generalization relationship between entities, where one entity is a specialized version of another entity.
12. **Total Participation**: Denoted by double lines connecting the entity to the relationship line, it signifies that every entity in the entity set must participate in at least one relationship instance in the relationship set.

These symbols collectively help to visualize the structure of the database and understand how different entities are related to each other.

ER diagram

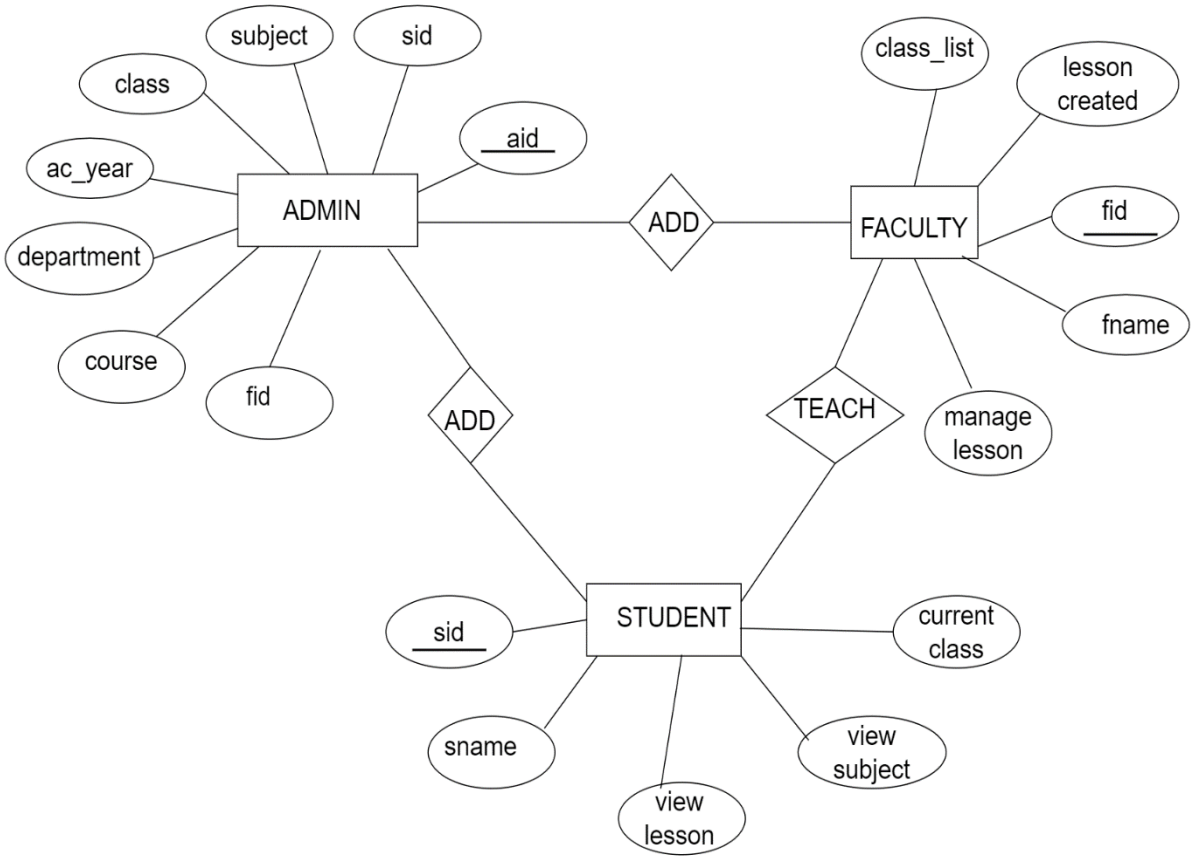


FIG : 4.2.1

An ERD is a type of flowchart that illustrates the relationships between different entities (data categories) in a database system.

The entities in this diagram are:

- Student (sid, sname)
- Faculty (fid, fname)
- Class (class)
- Department (department)
- Course (course)
- Subject (subject)
- Admin (ADMIN)
- Class_list (class_list, created)
- Lesson (lesson)
-

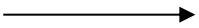
4.2.2 Data flow diagram

The data flow diagram shows the flow of data within any system. It is an important tool for designing phase of software engineering. Larry Constantine first developed it. It represents graphical view of flow of data. It's also known as BUBBLE CHART. The purpose of DFD is major transformation that will become in system design symbols used in DFD:-

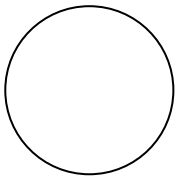
In the DFD, four symbols are used and they are as follows.

1. A square defines a source (originator) or destination of system data.

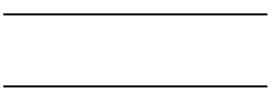
2. An arrow identifies data flow-data in motion. It is 2a pipeline through which information flows.



3. A circle or a "bubble "(Some people use an oval bubble) represents a process that transfers informing data flows into outgoing data flows.



4. An open rectangle is a data store-data at rest, or a temporary repository of data.



4.2.2.1 Context Level Diagram

This level shows the overall context of the system and its operating environment and shows the whole system as just one process. Online book store is shown as one process in the context diagram; which is also known as zero level DFD, shown below. The context diagram plays important role in understanding the system and determining the boundaries. The main process can be broken into sub-processes and system can be studied with more detail; this is where 1st level DFD comes into play.

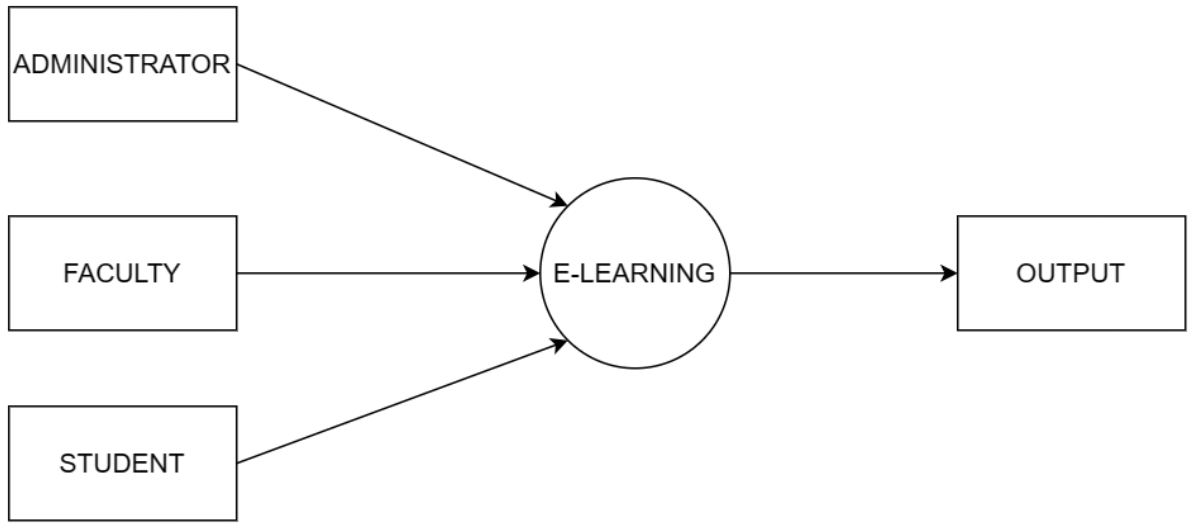


FIG : 4.2.2.1

0-Level DFD

4.2.2.2 First level data flow diagram

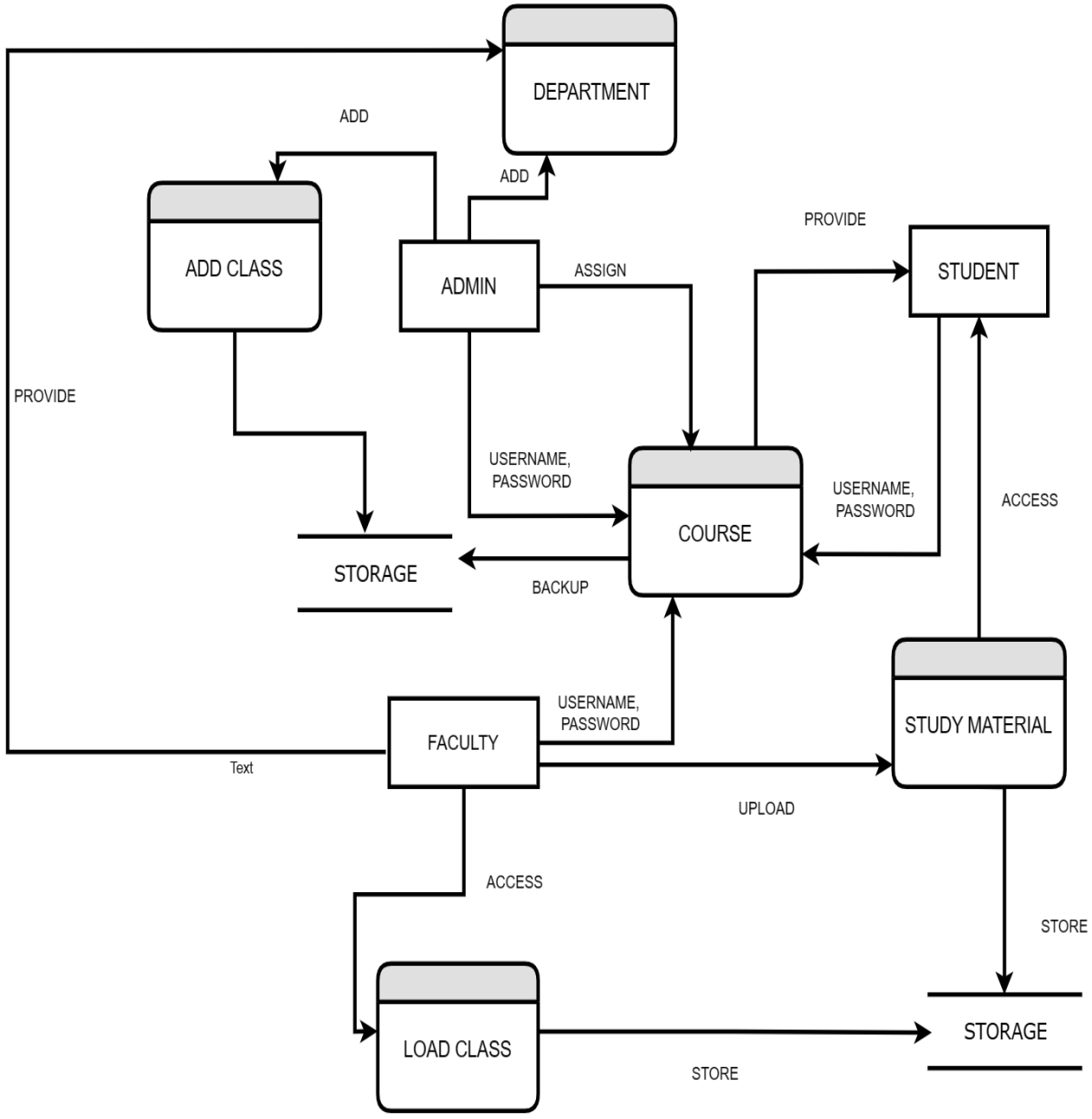


FIG : 4.2.2.2

1-Level DFD

The system consists of several components and functions, including:

- **Class & Department**: These are likely related to course management, where you can **ADD CLASS** and **ADD DEPARTMENT**.
- **Admin & Student**: These are user roles, and each has its own **USERNAME, PASSWORD** for access.
- **Course Access**: This function allows users to access courses, but the specifics aren't detailed.
- **Storage & Backup**: These features are for storing and safeguarding data, possibly including course materials and user information.
- **Faculty**: This term is mentioned, but its function isn't explicitly stated. It might be related to course management or instructor-specific features.
- **Study Material**: This likely refers to resources uploaded for students to access, handled by **UPLOAD STUDY MATERIAL** and **STORE STUDY MATERIAL**.

4.2.3 Use Case Diagram

4.2.3.1 Admin Module-

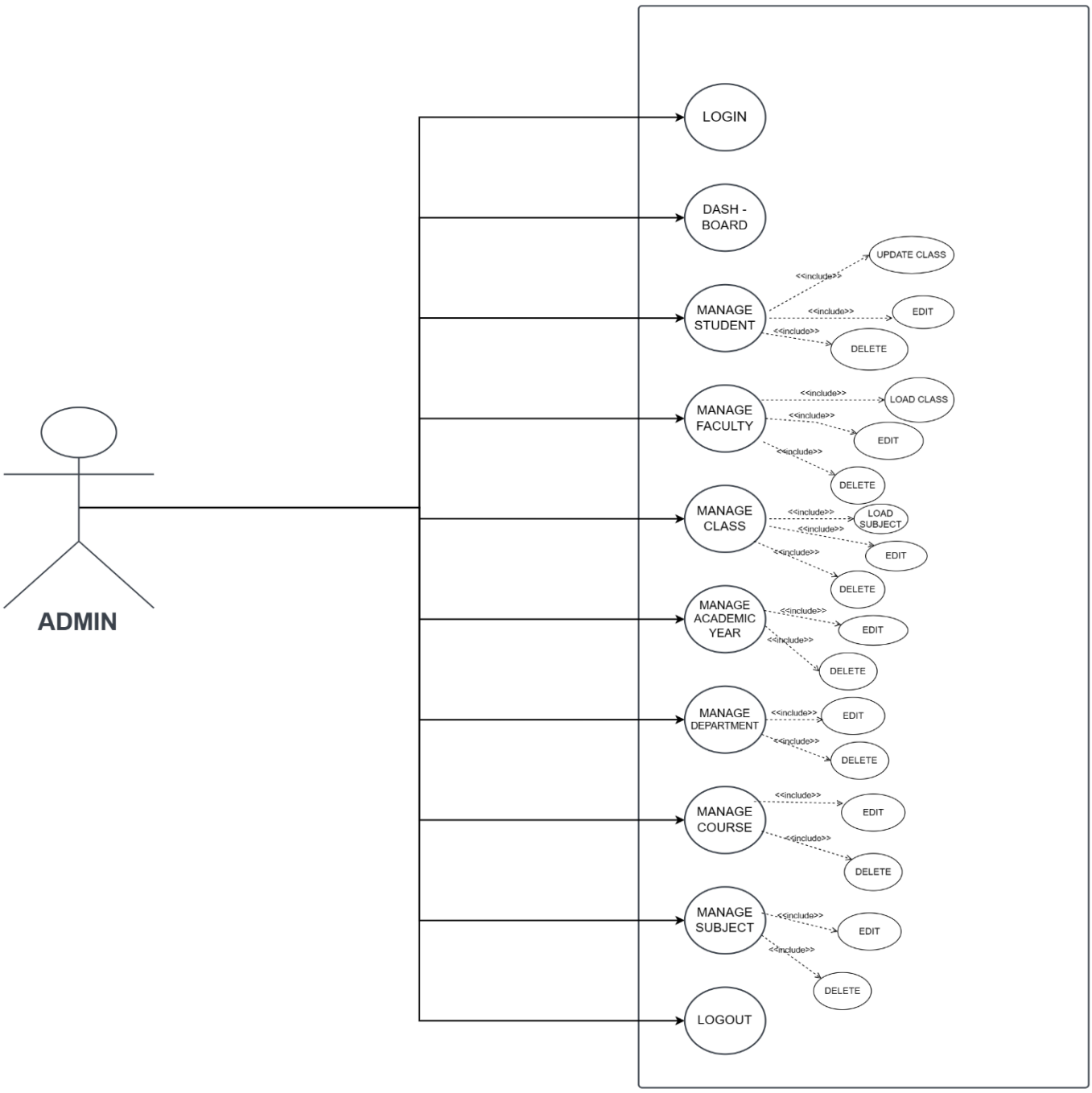


FIG : 4.2.3.1

Here’s a breakdown of the functionalities the admin can manage:

- **Login:** This is the function that allows to enter the LMS.
- **Dashboard:** This is the homepage that admin see after logging in. It provides an overview of their activity in the LMS.
- **Manage Students:** This section likely allows the admin to add, edit, or delete student information.
- **Manage Faculty:** Similar to students, this section may allow the admin to add, edit, or delete faculty information.
- **Manage Classes:** This section likely allows the admin to add, edit, or delete classes.
- **Manage Subjects:** This section may allow the admin to add, edit, or delete subjects.
- **Manage Academic Years:** This section may allow the admin to add, edit, or delete academic years.
- **Manage Departments:** This section may allow the admin to add, edit, or delete departments.
- **Manage Courses:** This section may allow the admin to add, edit, or delete cours
- **Logout:** This function allows to end their session on the LMS.

4.2.3.2 Faculty and Student Module-

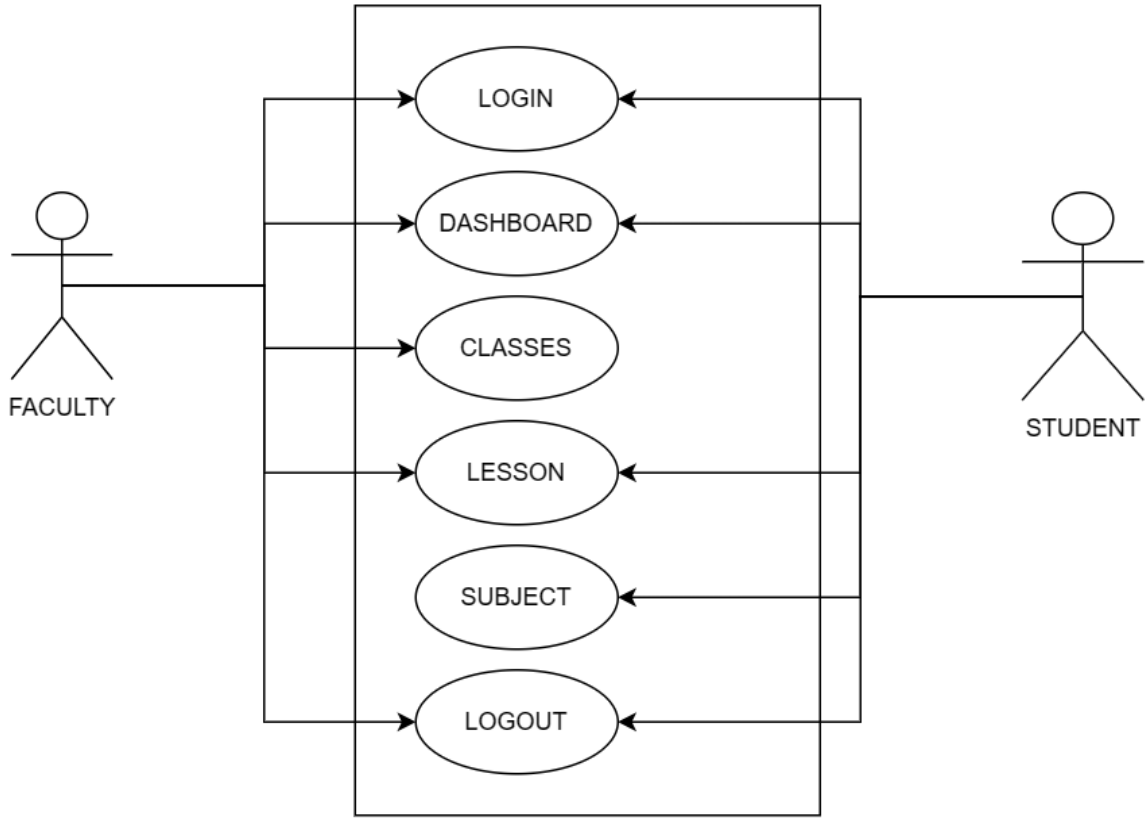


FIG : 4.2.3.2

The diagram shows the following components of an LMS:

- **Students:** Students are the users who enroll in and take courses.
- **Faculty:** Faculty are the instructors who create and teach courses.
- **Classes:** Classes are the courses that students enroll in and faculty teach.
- **Login:** This is the function that allows students and faculty to enter the LMS.
- **Dashboard:** This is the homepage that students and faculty see after logging in. It provides an overview of their activity in the LMS.
- **Classes:** This section of the LMS likely allows students to view a list of the courses they are enrolled in and faculty to view a list of the courses they are teaching.
- **Subjects:** This section may allow faculty to manage the subjects they teach.
- **Lessons:** This section likely refers to the course material that faculty create and deliver to students.
- **Logout:** This function allows students and faculty to end their session on the LMS.

4.2.4 Flowchart

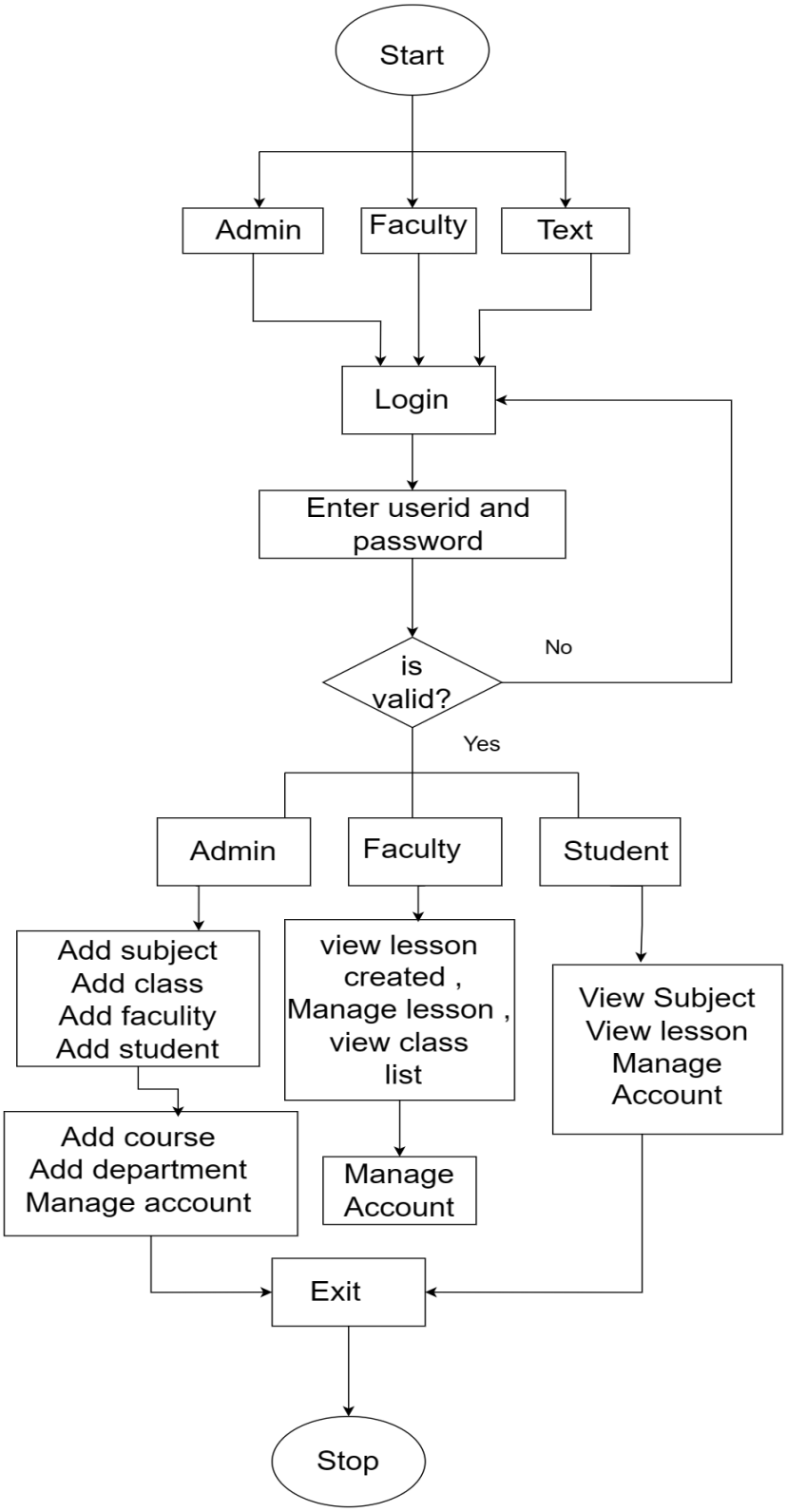


FIG : 4.2.4

The image is a flowchart that shows the process of entering a student into a learning management system (LMS). Here's a breakdown of the process:

1. **Start:** The process begins here.
2. **Login:** The system determines if the user logging in is an admin, faculty member, or student.
3. **Admin/Faculty/Student:** The path diverges depending on the type of user logging in.
    - **Admin:** An admin can add a subject, view lessons created, manage lessons, view a class list, or manage their account.
    - **Faculty:** Faculty members can add a subject, view lessons created, manage lessons, view classes they created, manage their account, and add a student.
    - **Student:** Students can view a list of subjects, view lessons, manage their account, and exit the system.
4. **Exit:** This path indicates the end of the process.

Once a user logs in, the system checks if the userid and password are valid. If they are valid, the user is directed to a menu that corresponds to their user type. If the userid and password are not valid, the user is directed back to the login screen.

CHAPTER 5

DESIGN SPECIFICATION

5.1 Snapshots of Admin Module-

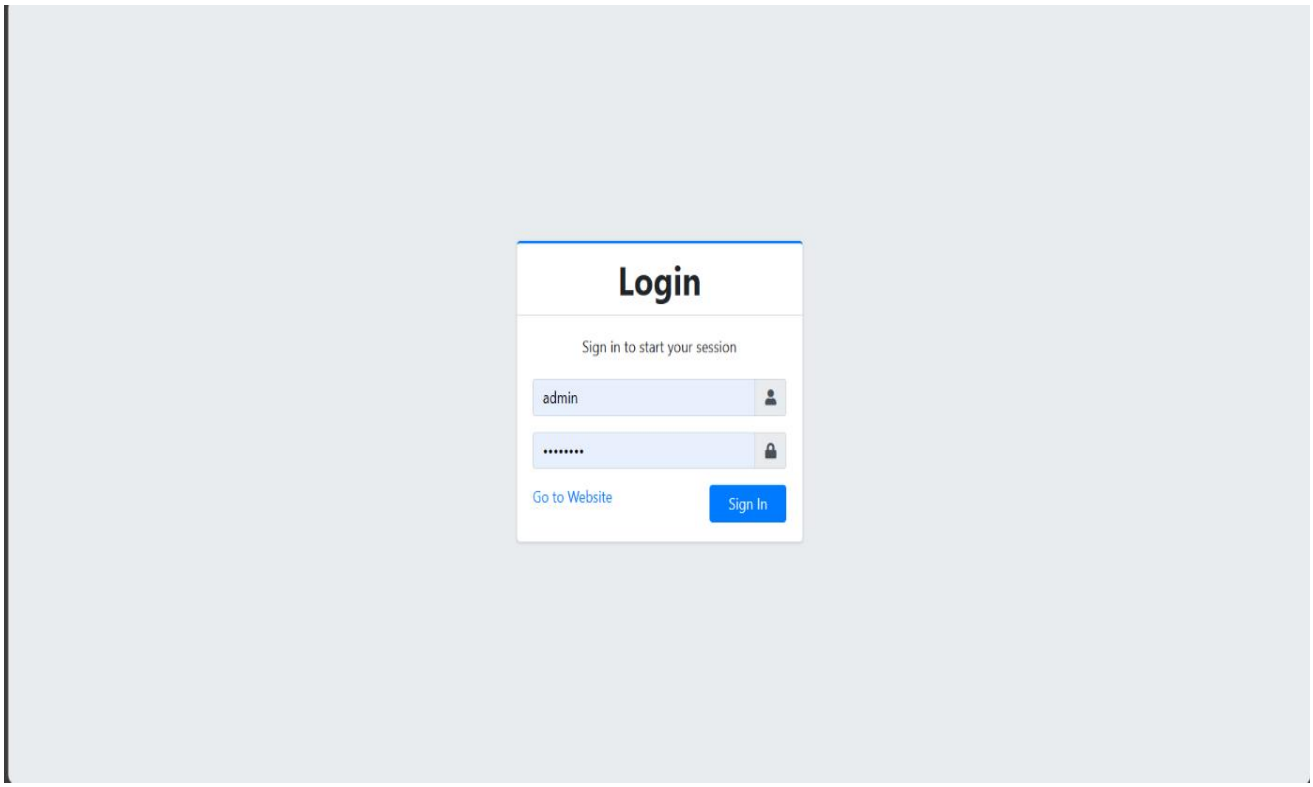


Fig 5.1 Login page of Admin Module

5.2 Dashboard

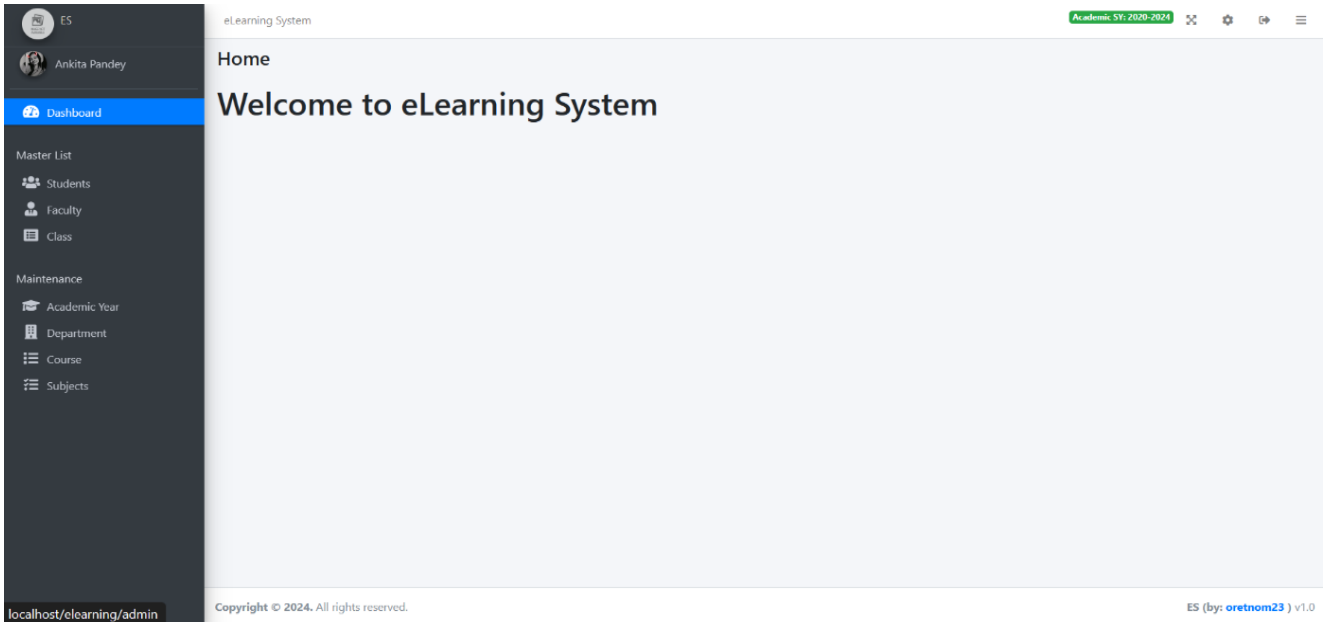


Fig 5.2 : Dashboard of Admin Module

5.3 Student

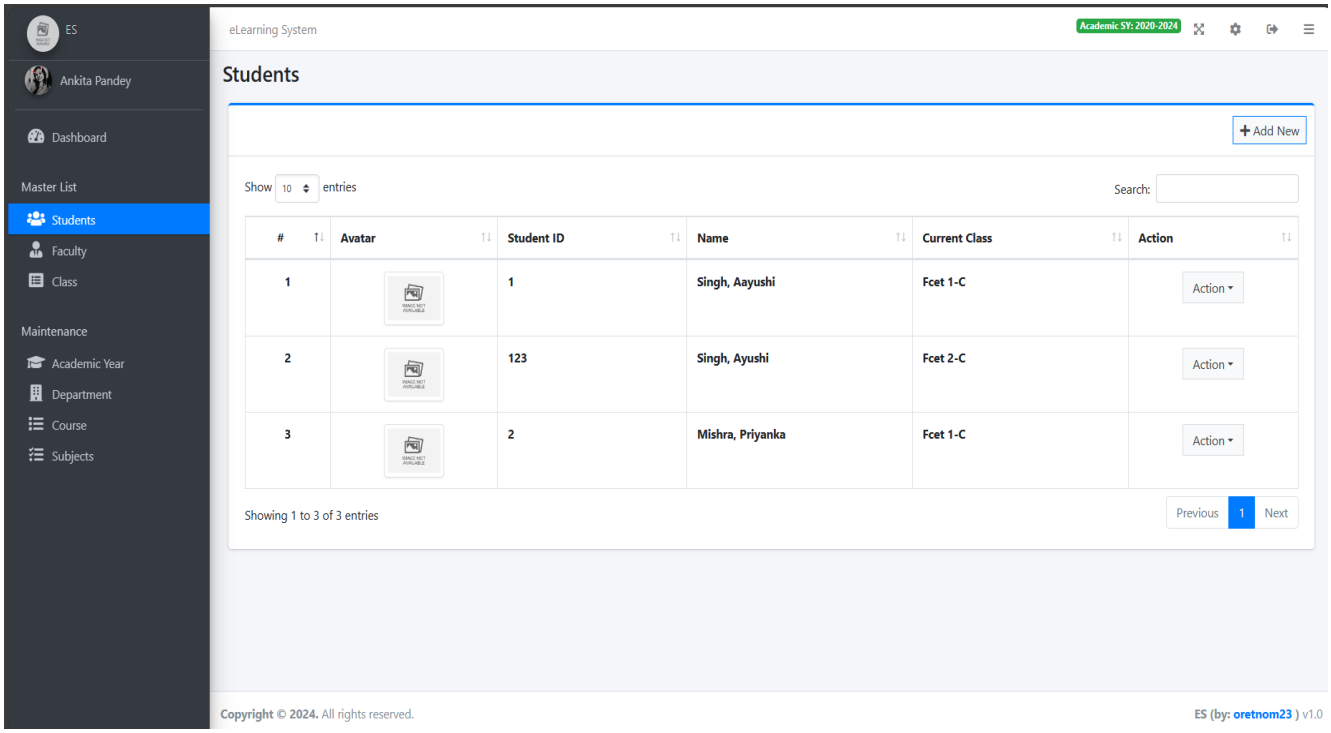


Fig 5.3 : Student module in Admin Page

5.4 Add Student

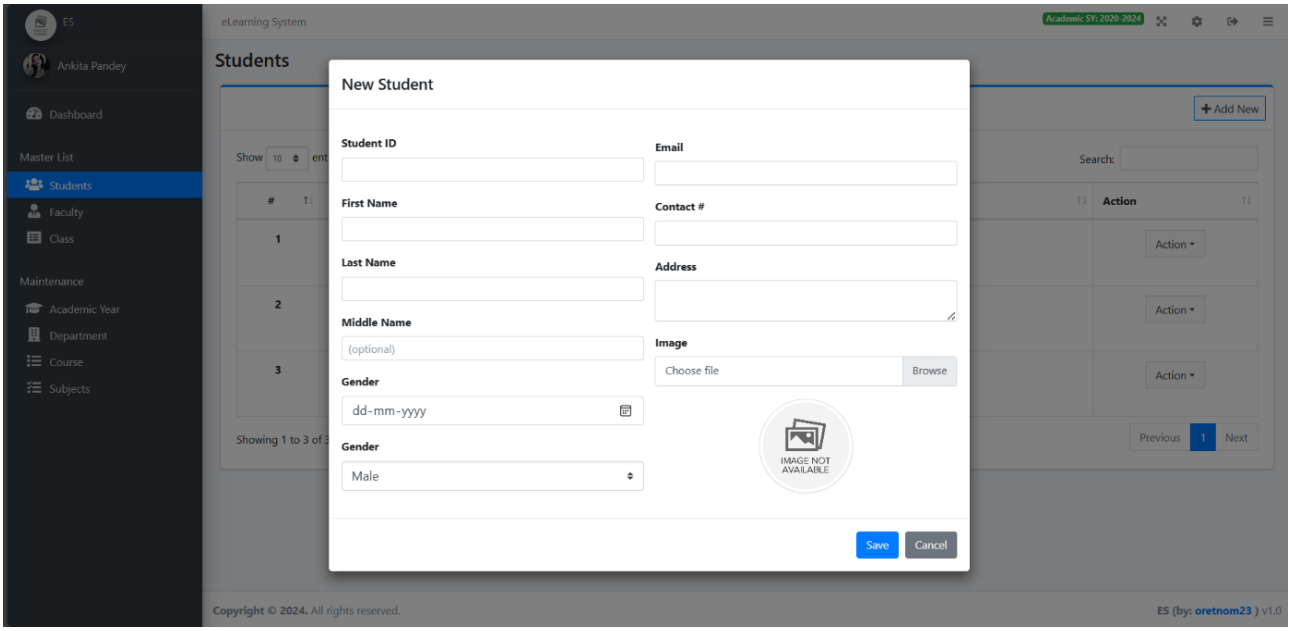


Fig 5.4 : Add New Student

5.5 Faculty

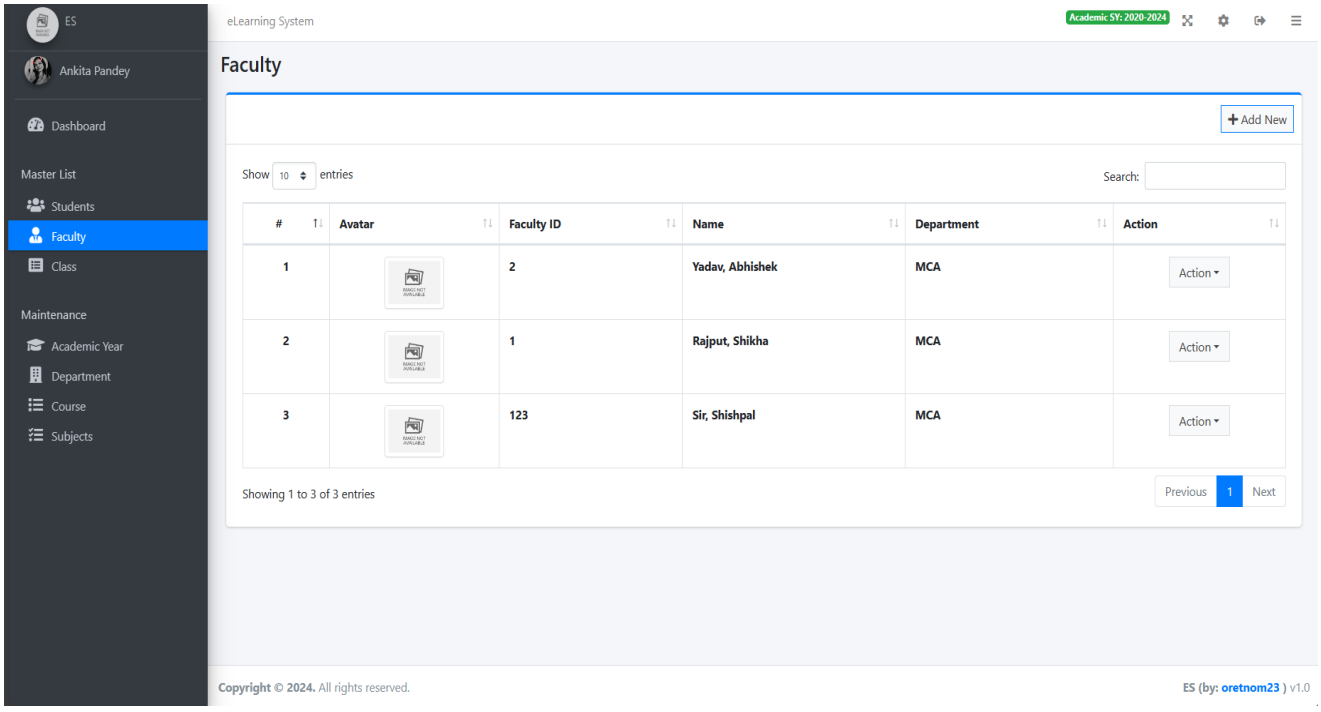


Fig 5.5 Faculty Module in Admin Page

5.6 Add Faculty

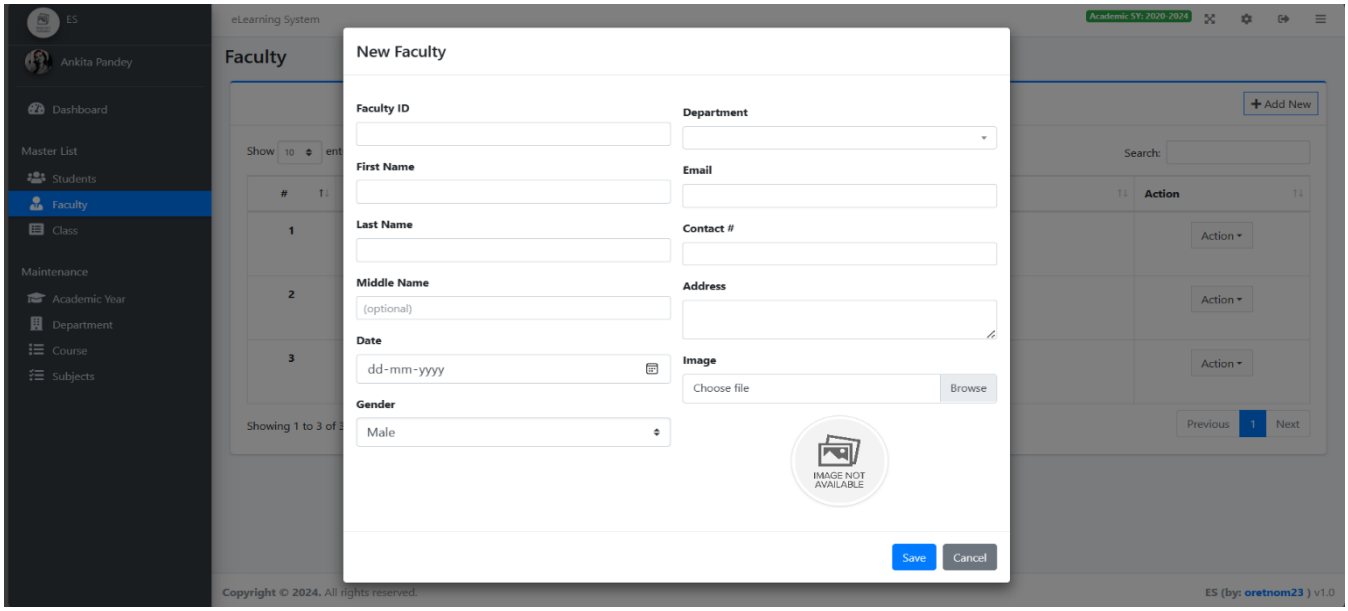


Fig 5.6 : Add New Faculty

5.7 Class

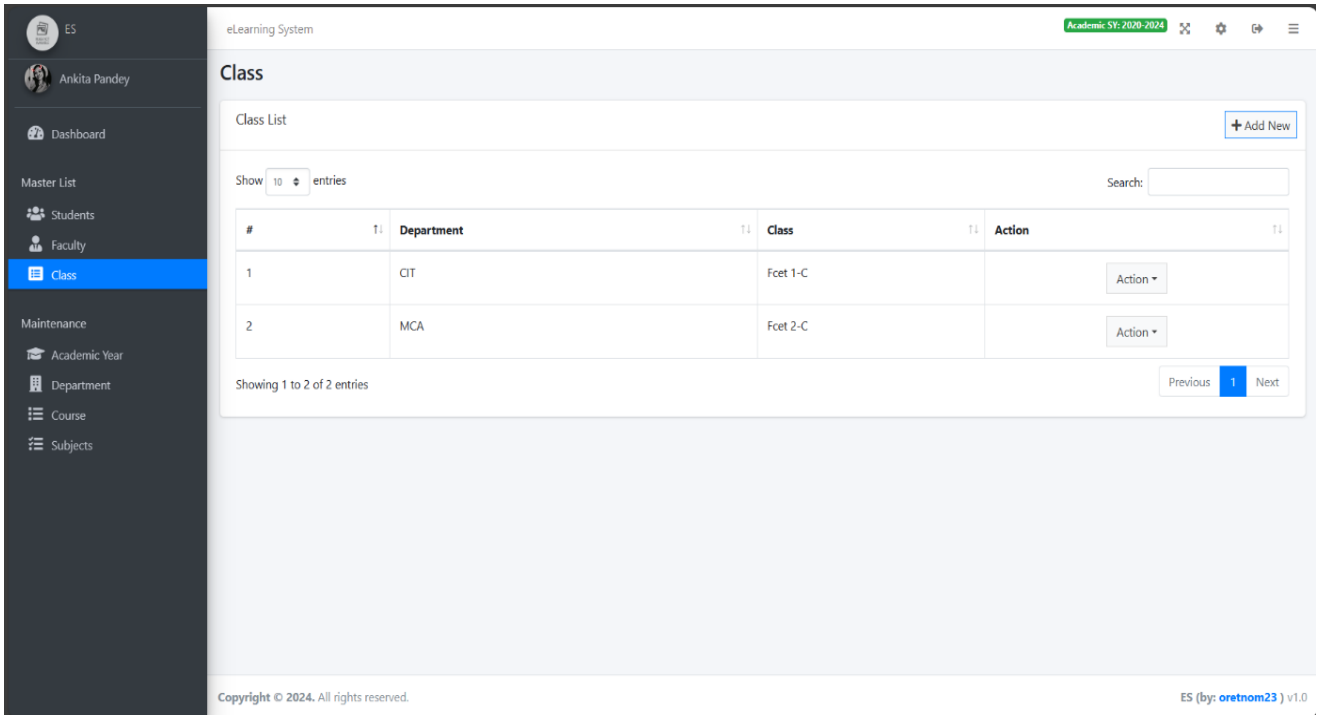


Fig : 5.7

5.8 Add Class

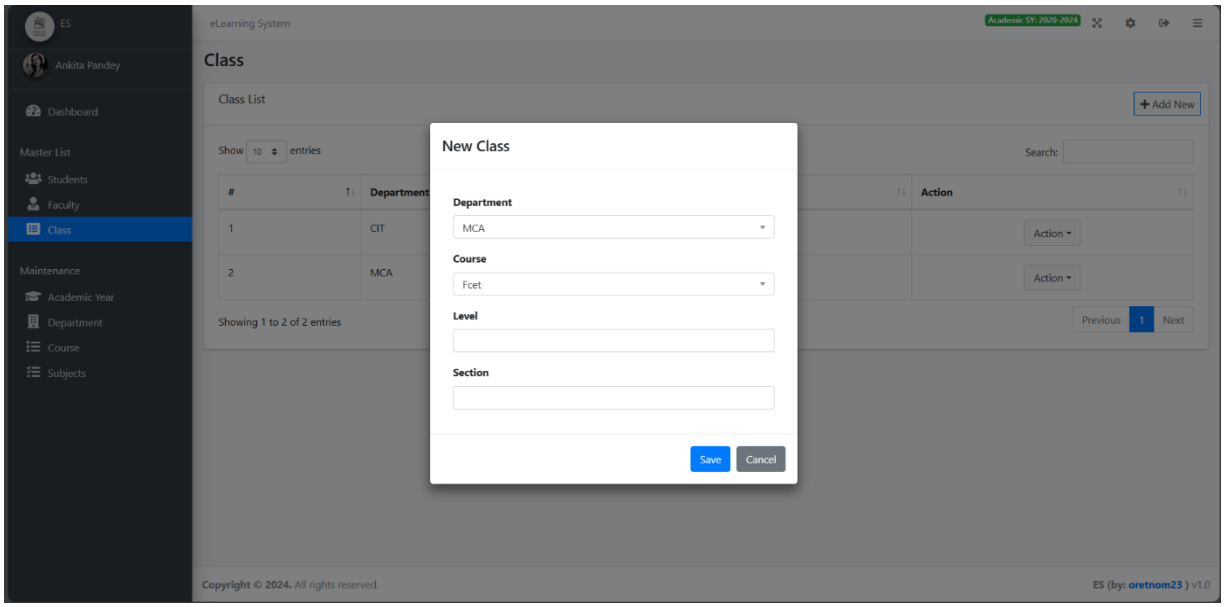


Fig 5.8: Add New Class

5.9 Academic Year

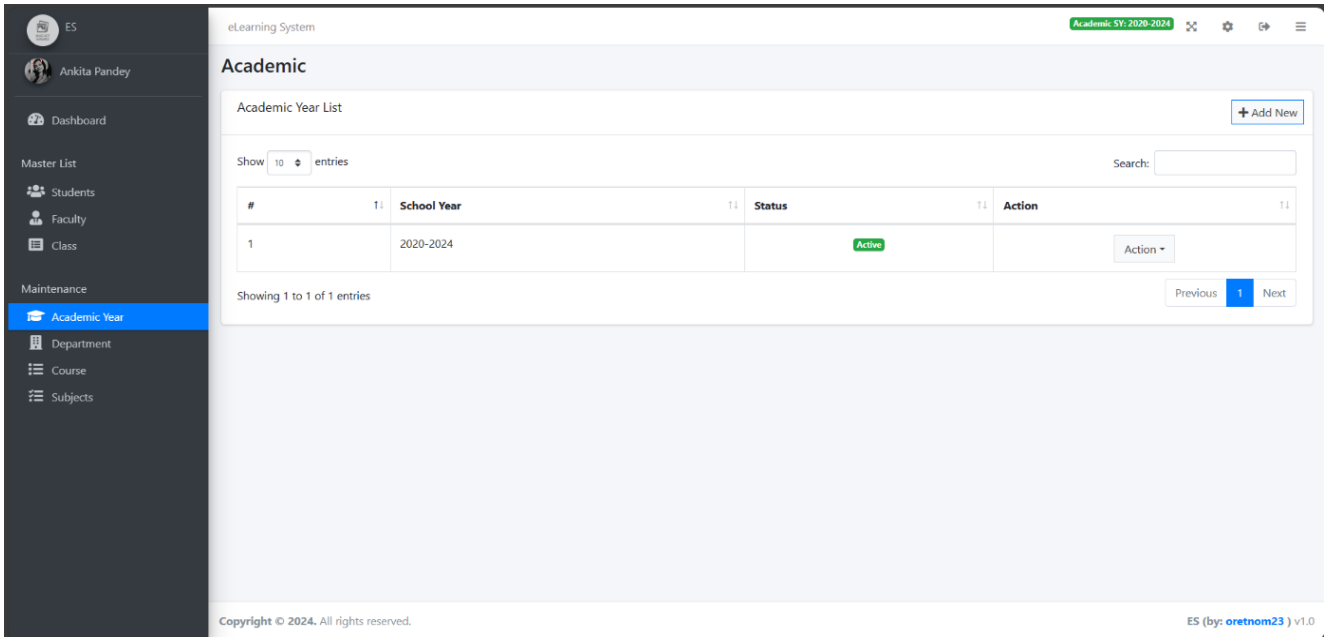


Fig 5.9 Academic year

5.10 Add Academic Year

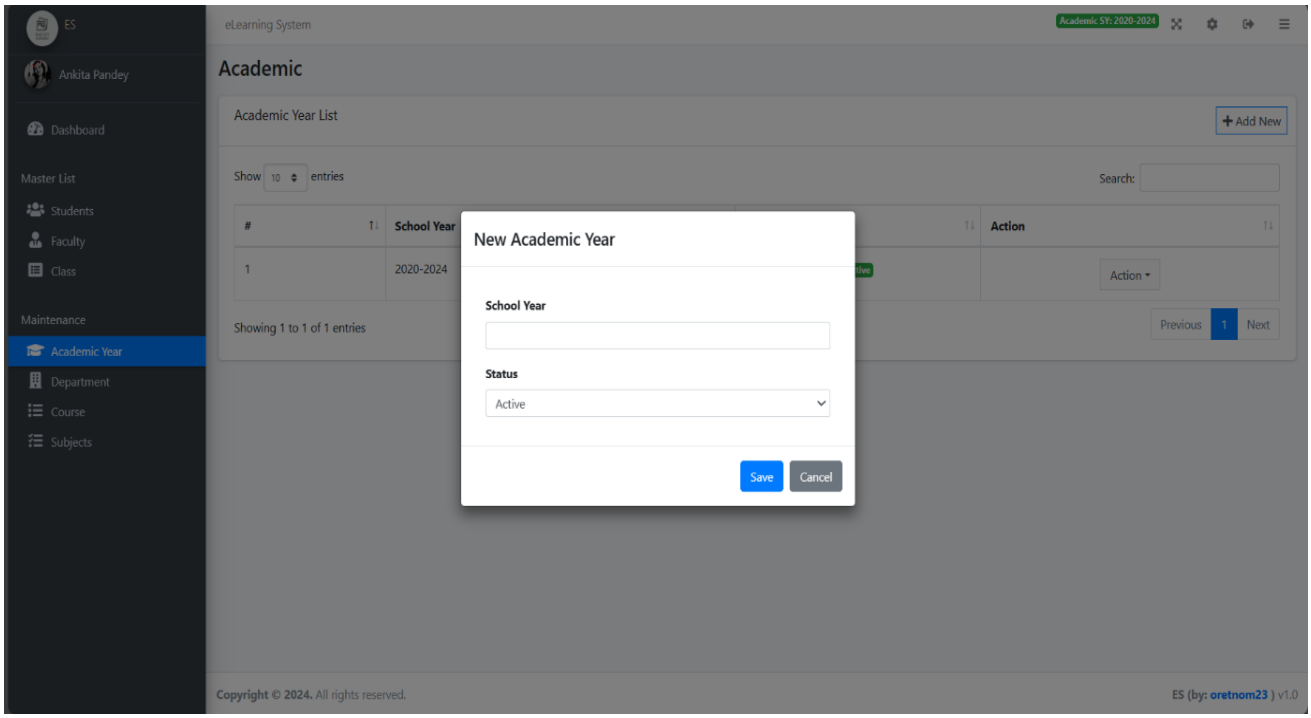


Fig 5.10 Add New Academic year

5.11 Department

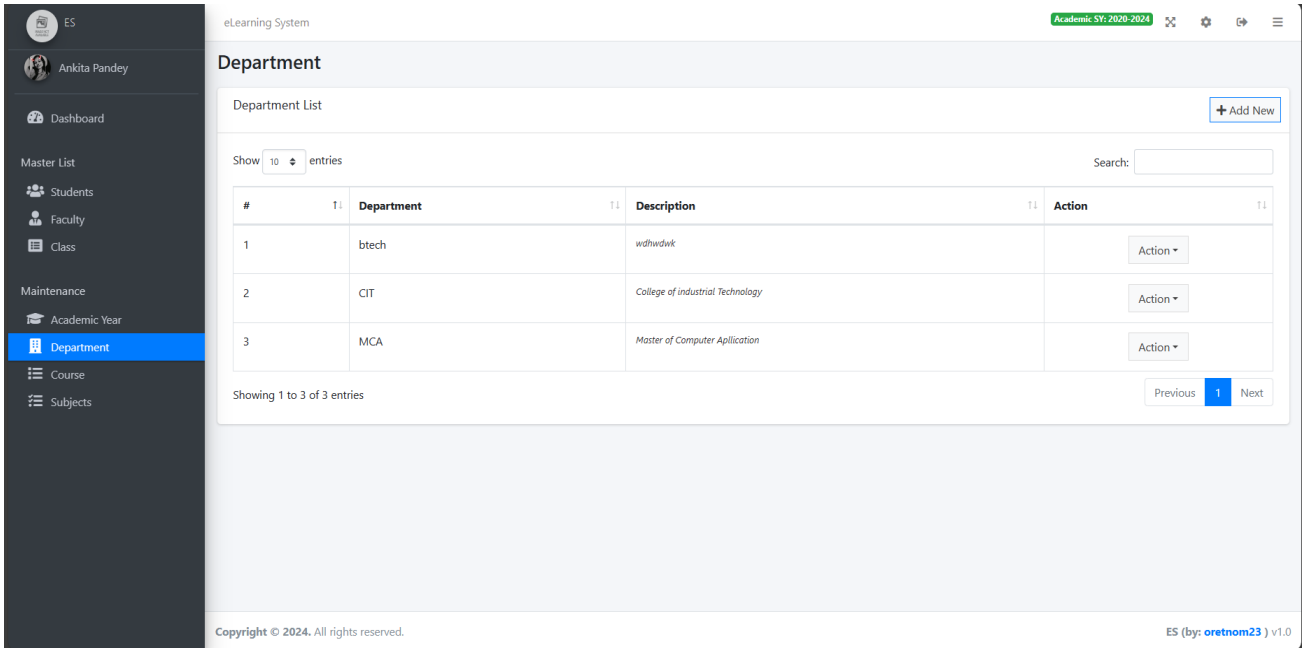


Fig 5.11: Department

5.12 : Add Department

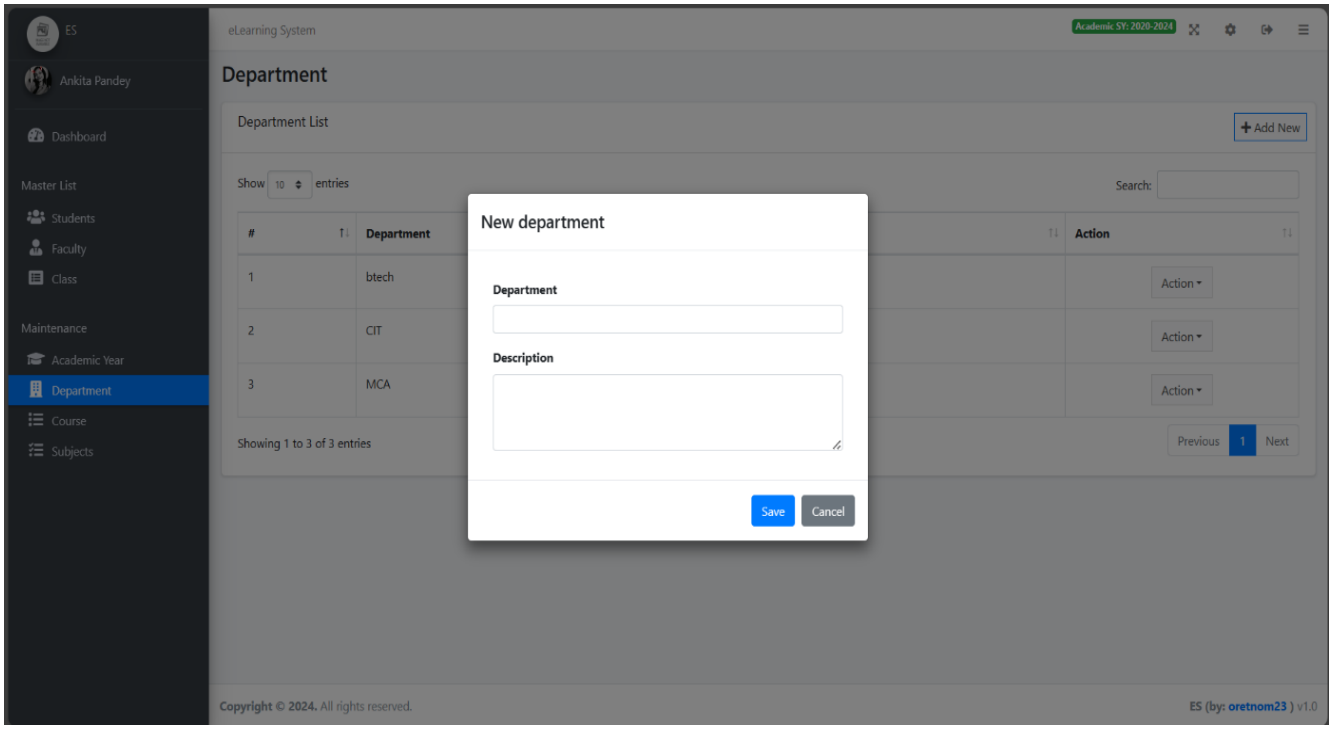


Fig 5.12 Add New Department

5.13 Course

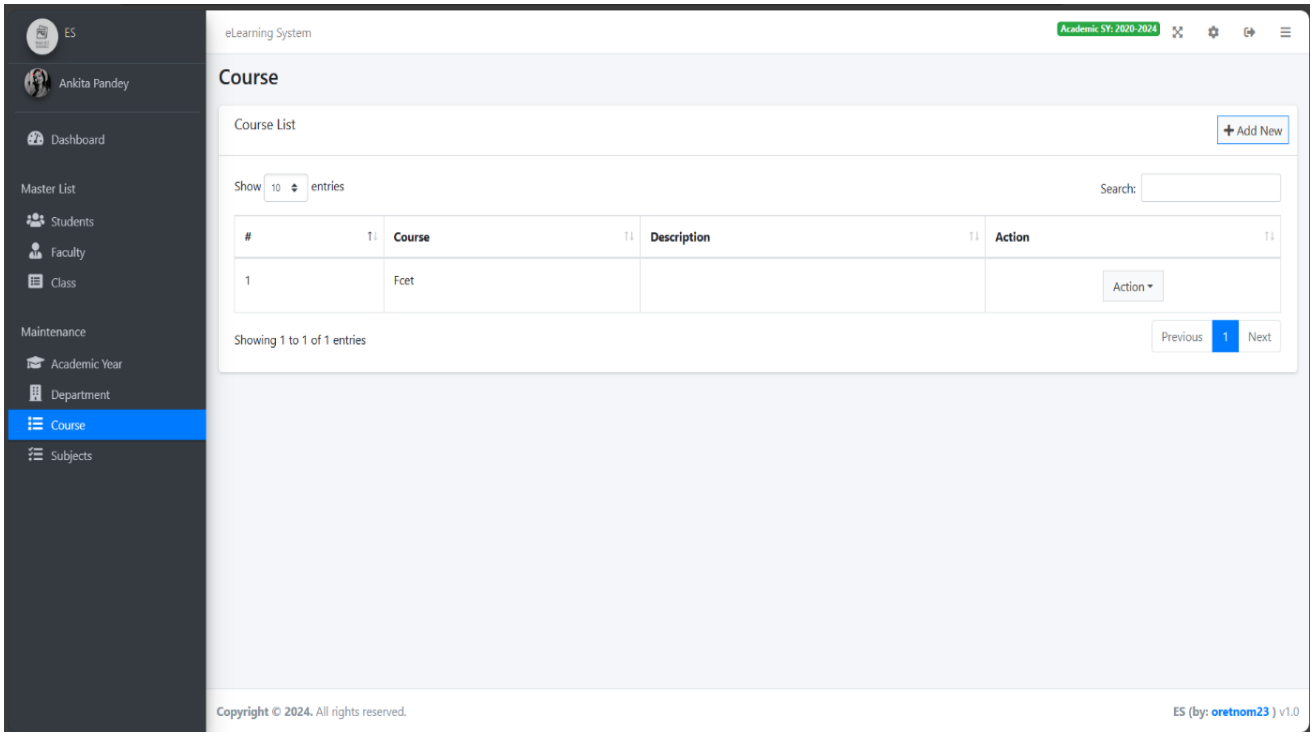


Fig 5.13 Course

5.14 Subject

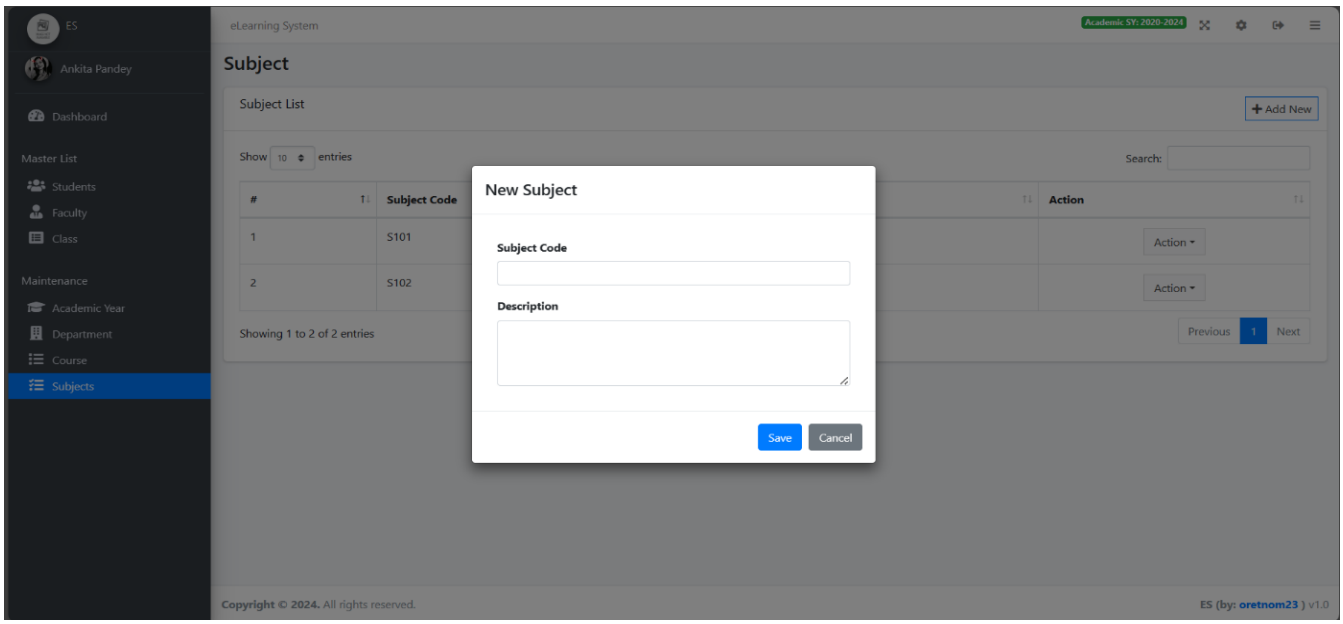


Fig 5.14

5.15 Delete Subject

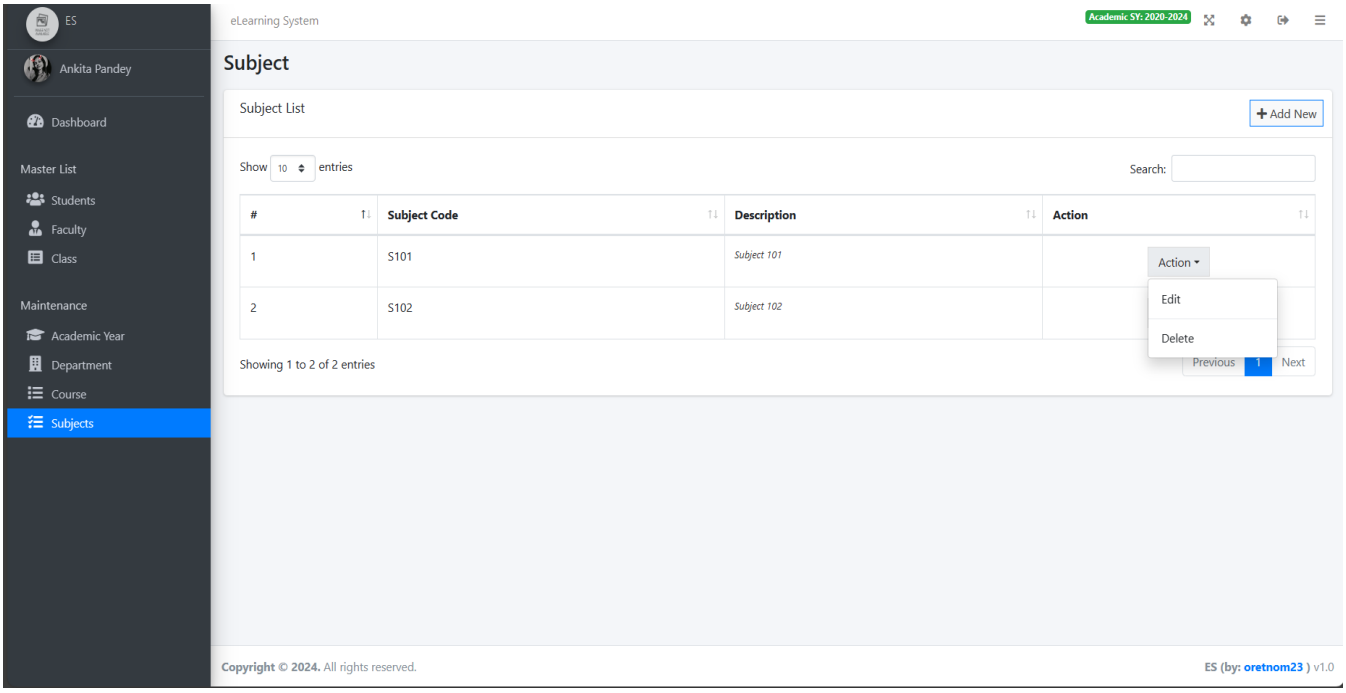


Fig 5.15

5.16 Delete Course

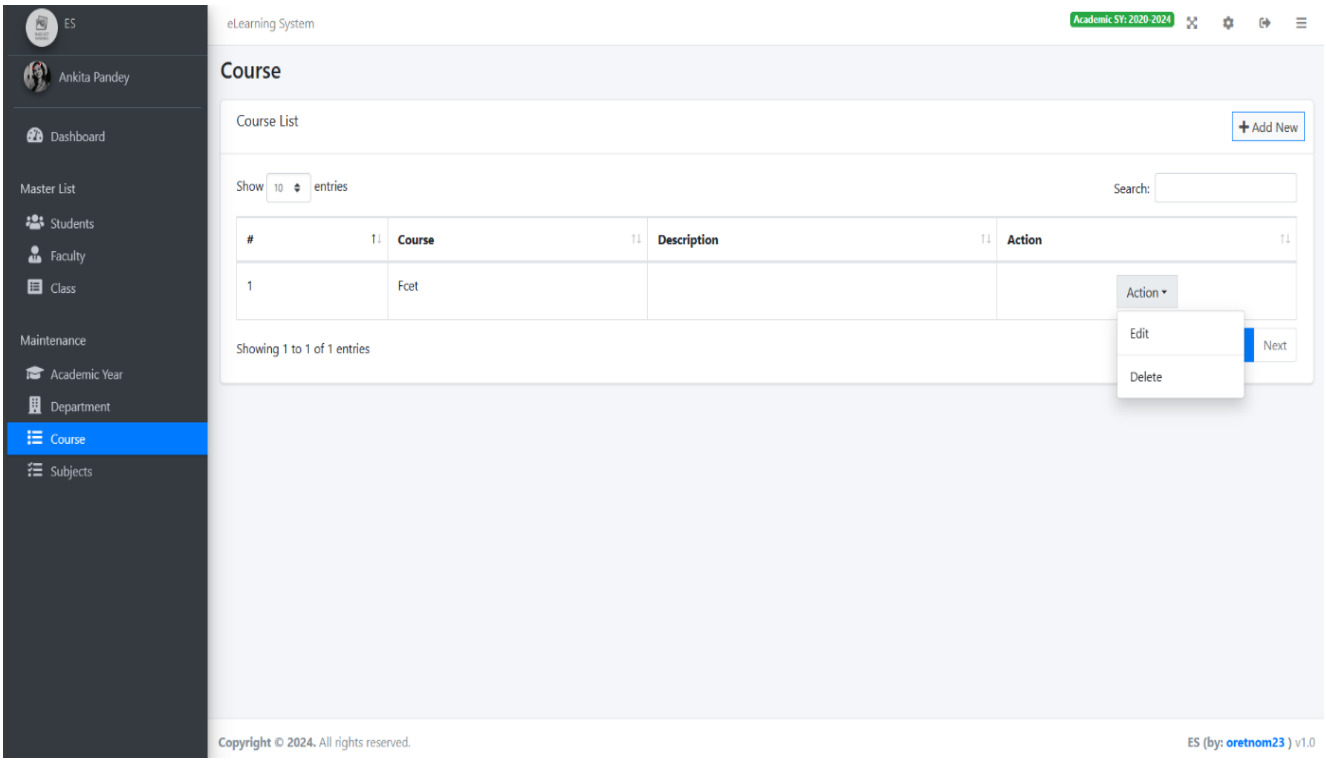


Fig 5.16

5.17 Delete Department

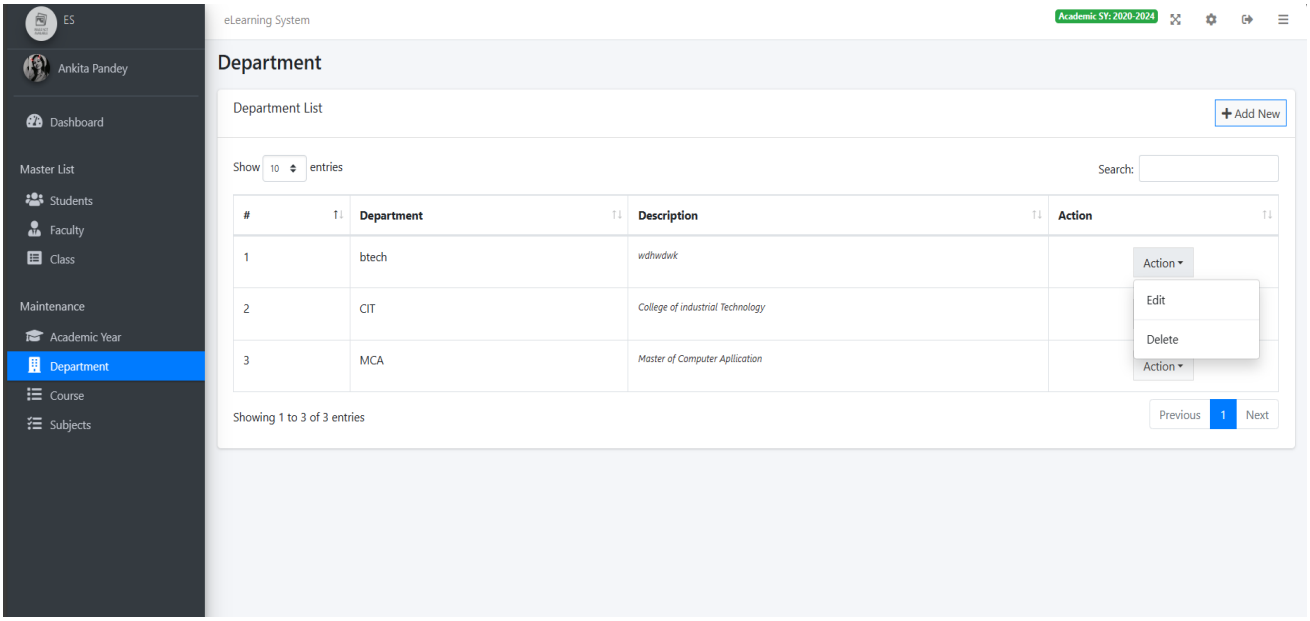


Fig 5.17

5.18 Delete Academic Year

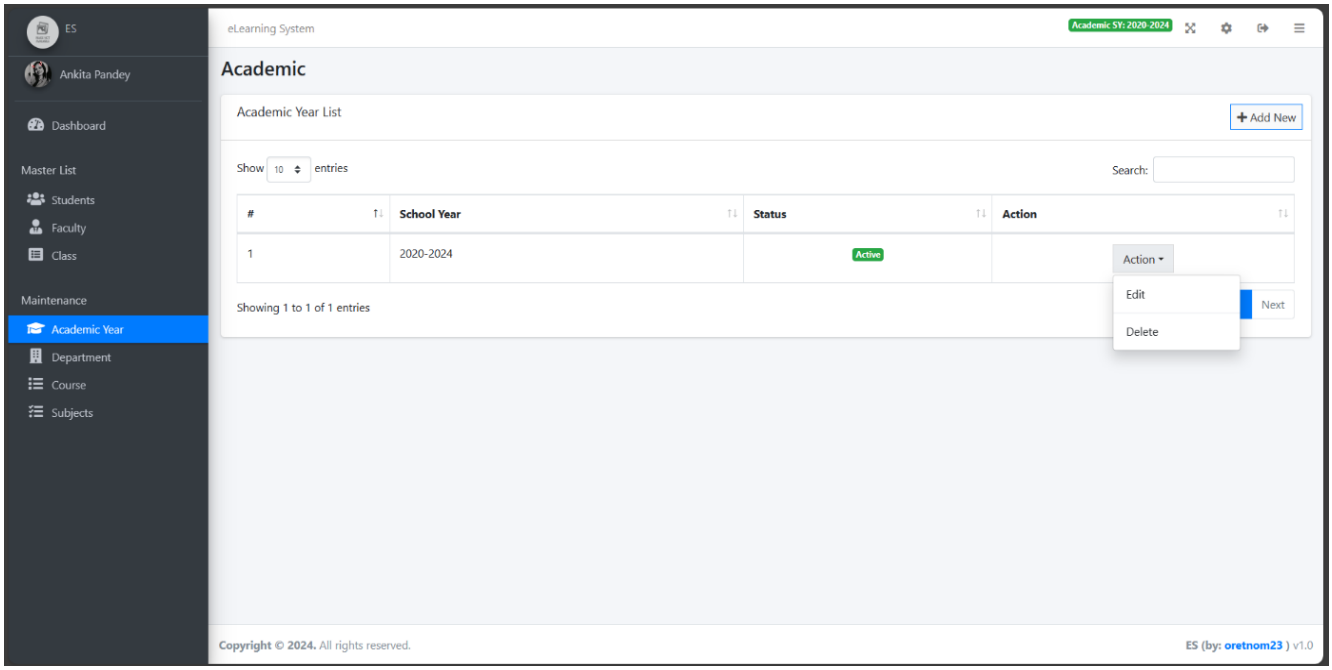


Fig 5.18

5.19 Delete Class

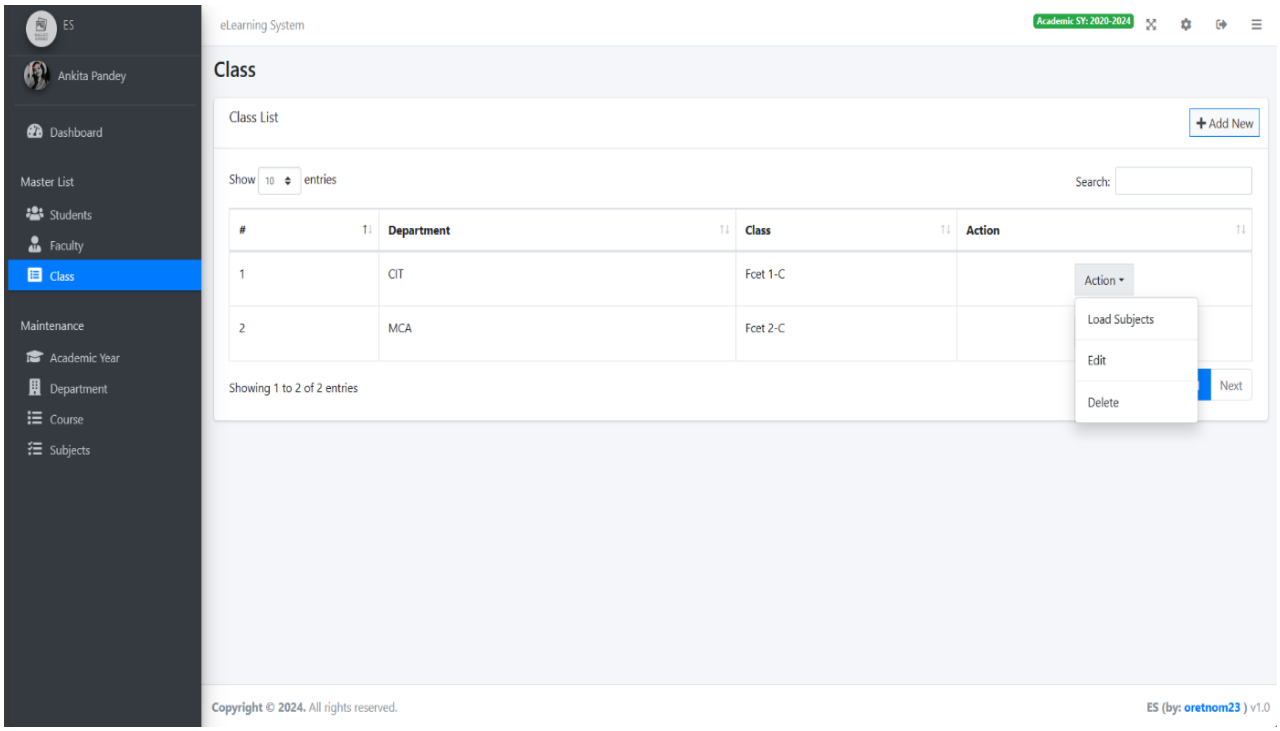


Fig : 5.19 Delete Class

5.20 Delete Faculty

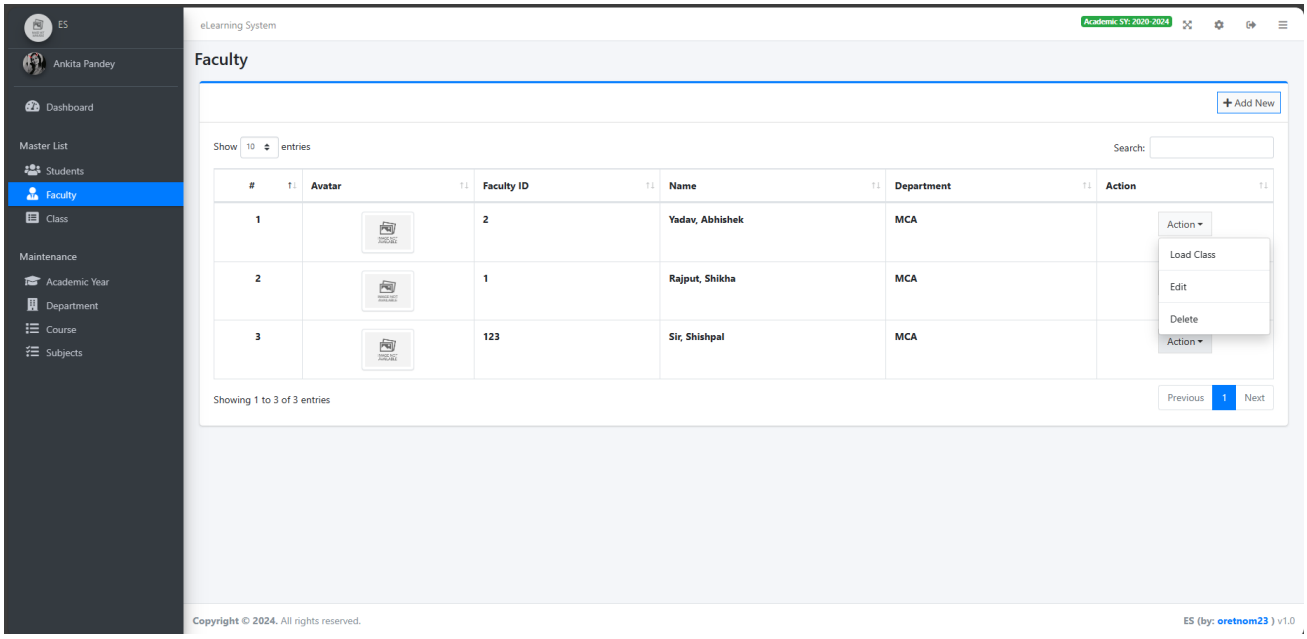


Fig : 5.20

5.21 Delete Student

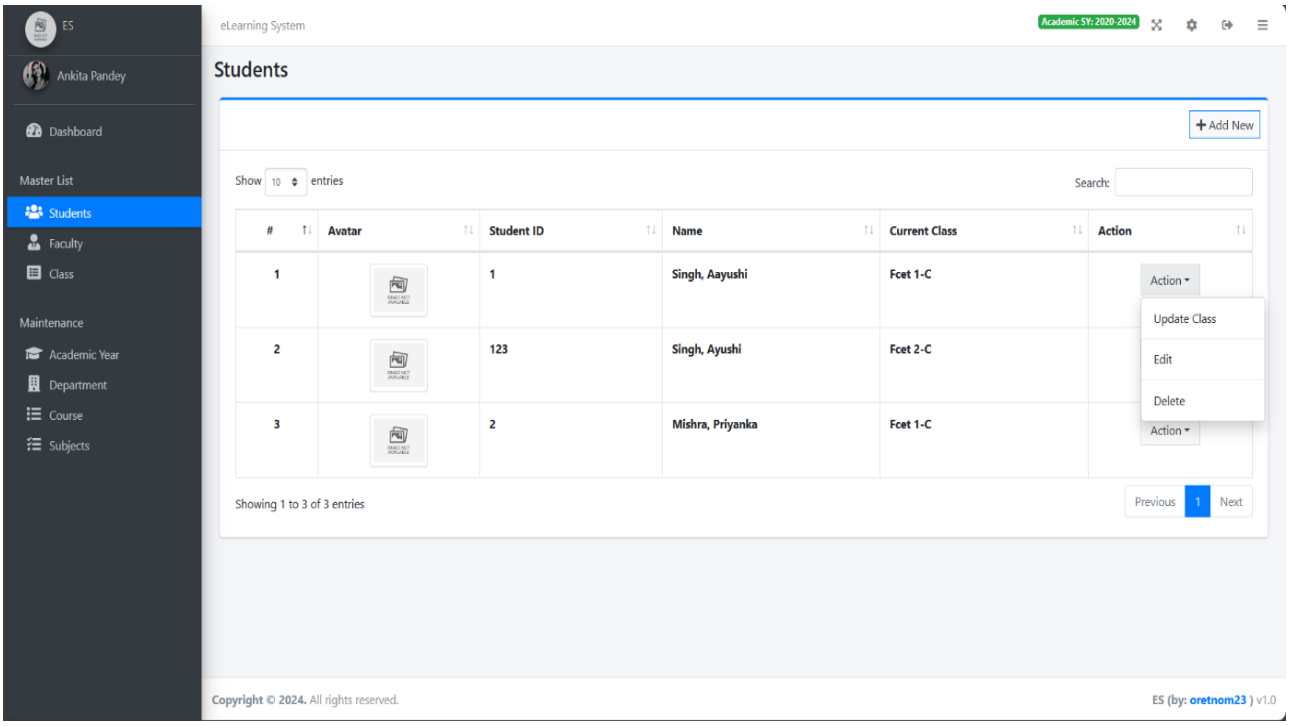


Fig : 5.21

5.22 Manage Admin

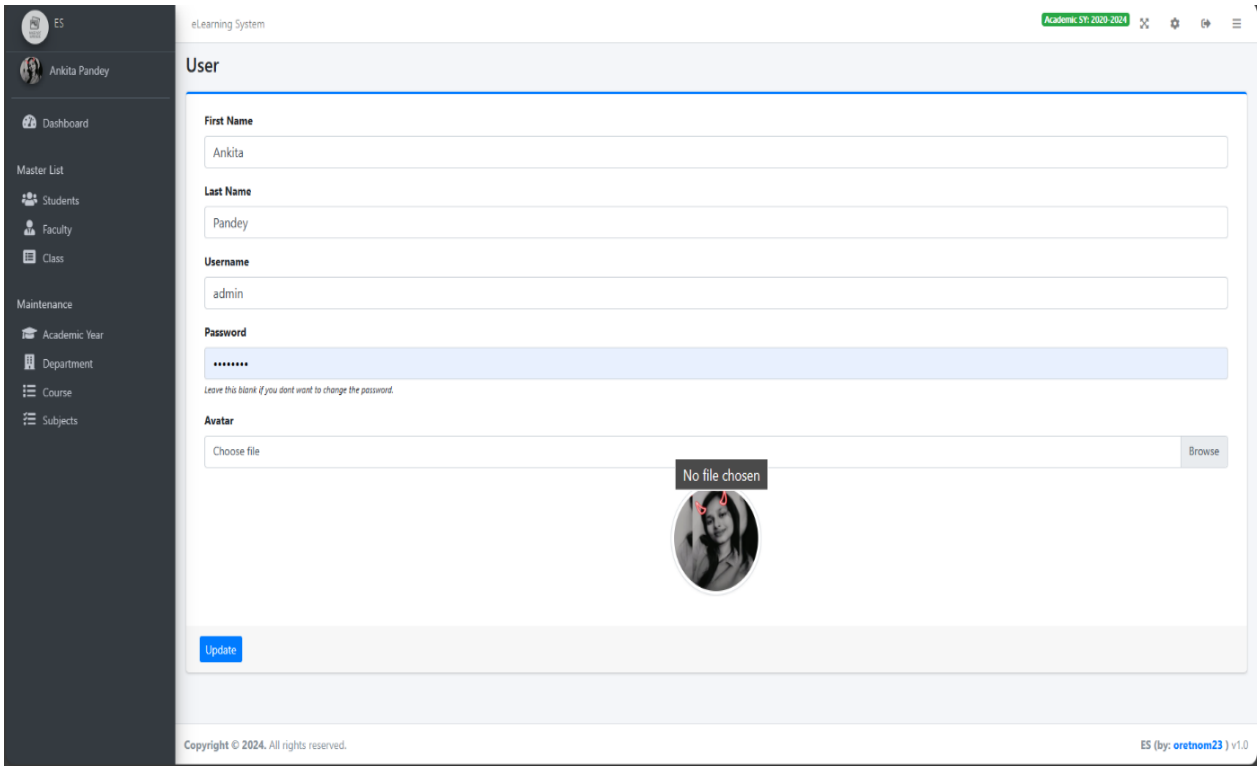
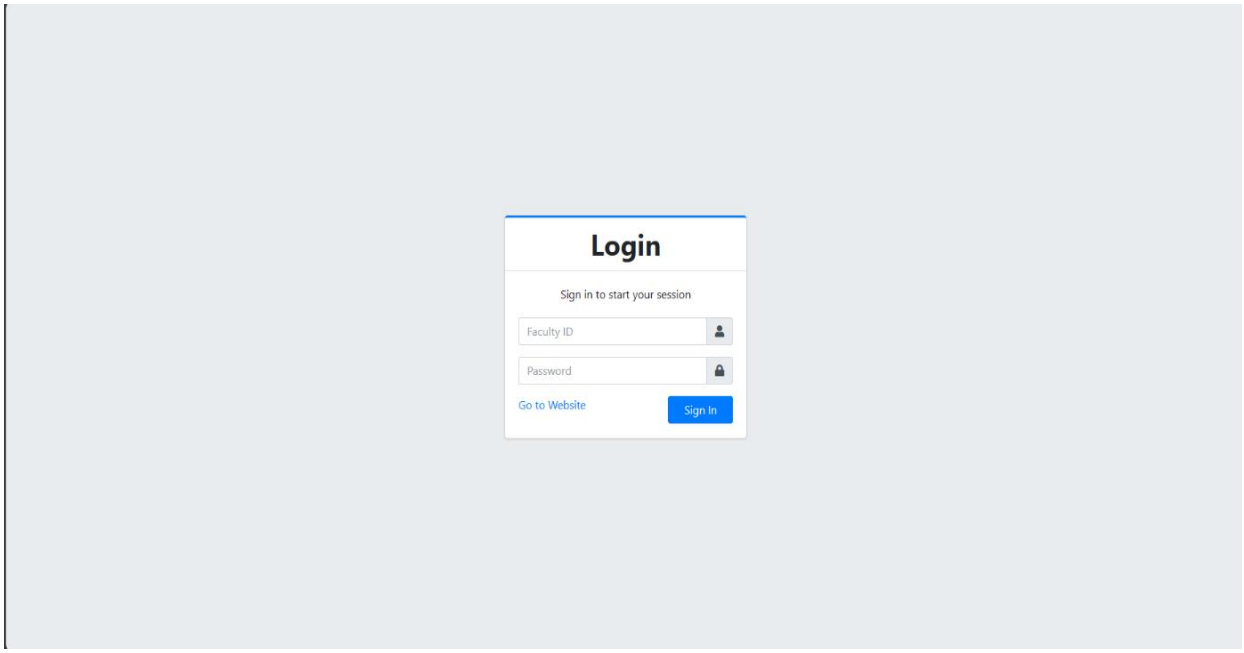


Fig : 5.22

5.23 Snapshot of Faculty Module



5.23 Snapshot of Faculty Module

5.24 Manage Faculty Data

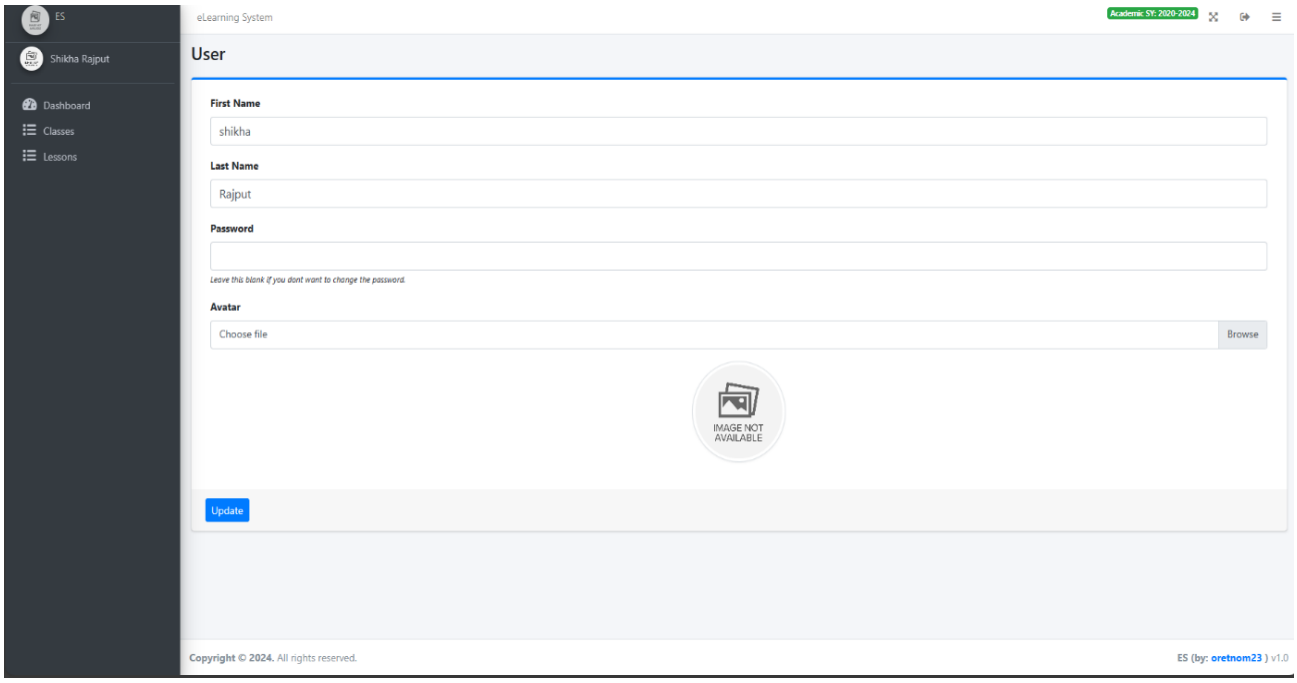


Fig: 5.24

5.25 Dashboard of Faculty

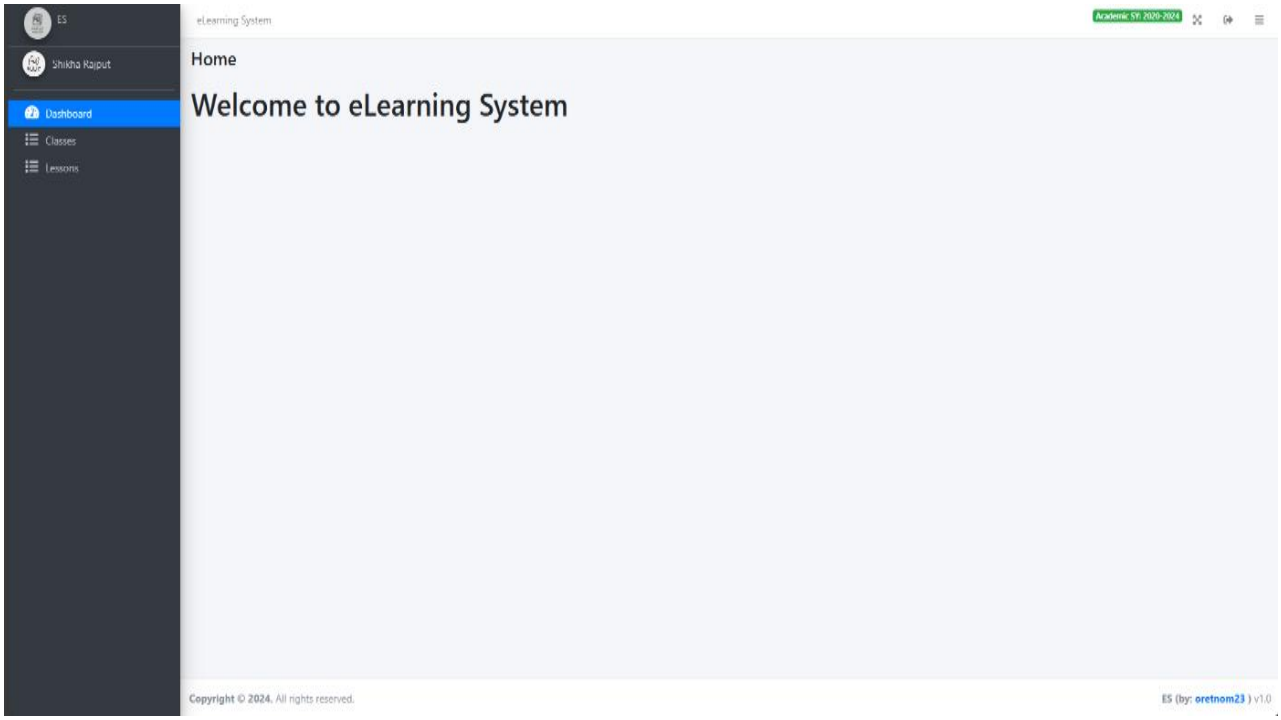


Fig : 5.25

5.26 Classes in Faculty Module

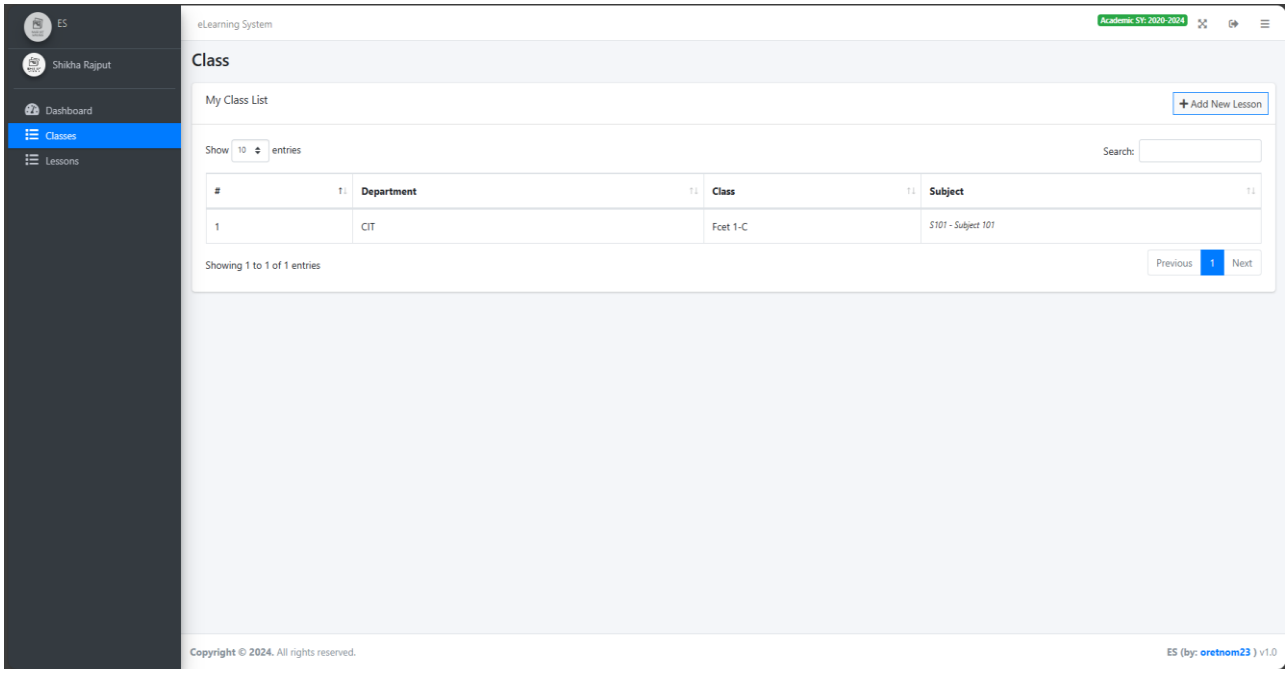
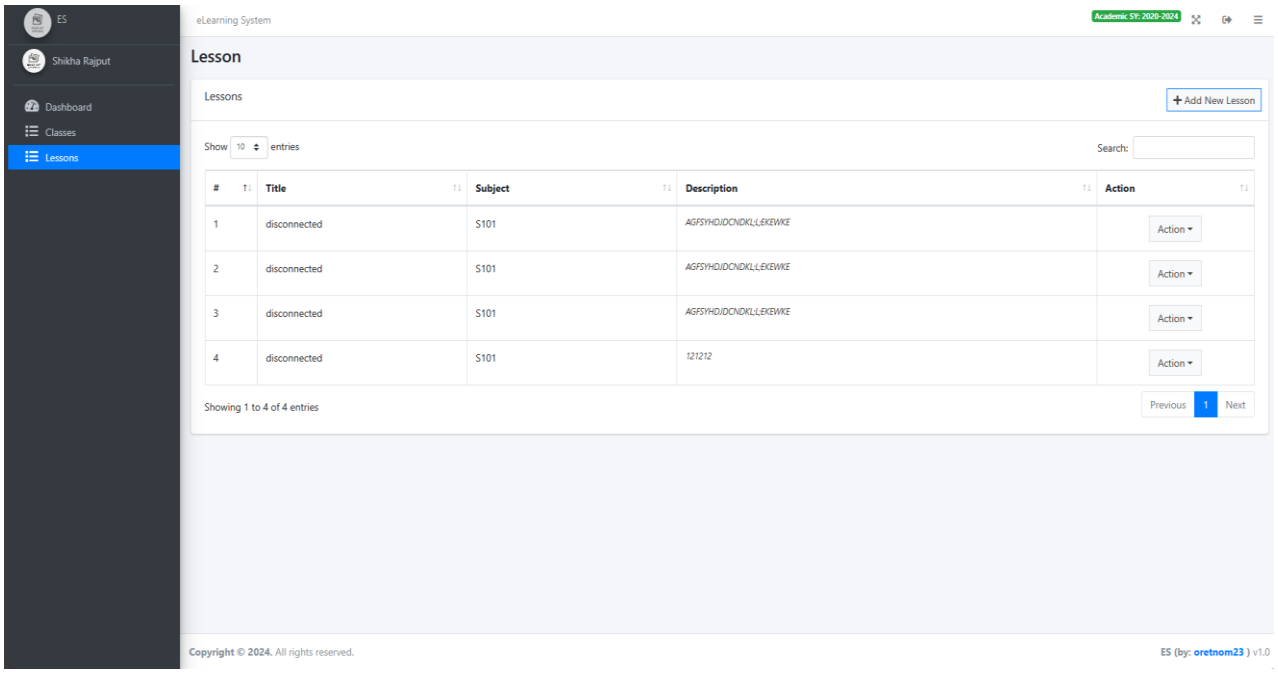


Fig : 5.26

5.27 Lesson in Faculty Module



5.27 Lesson in Faculty Module

5.28 Add Lesson

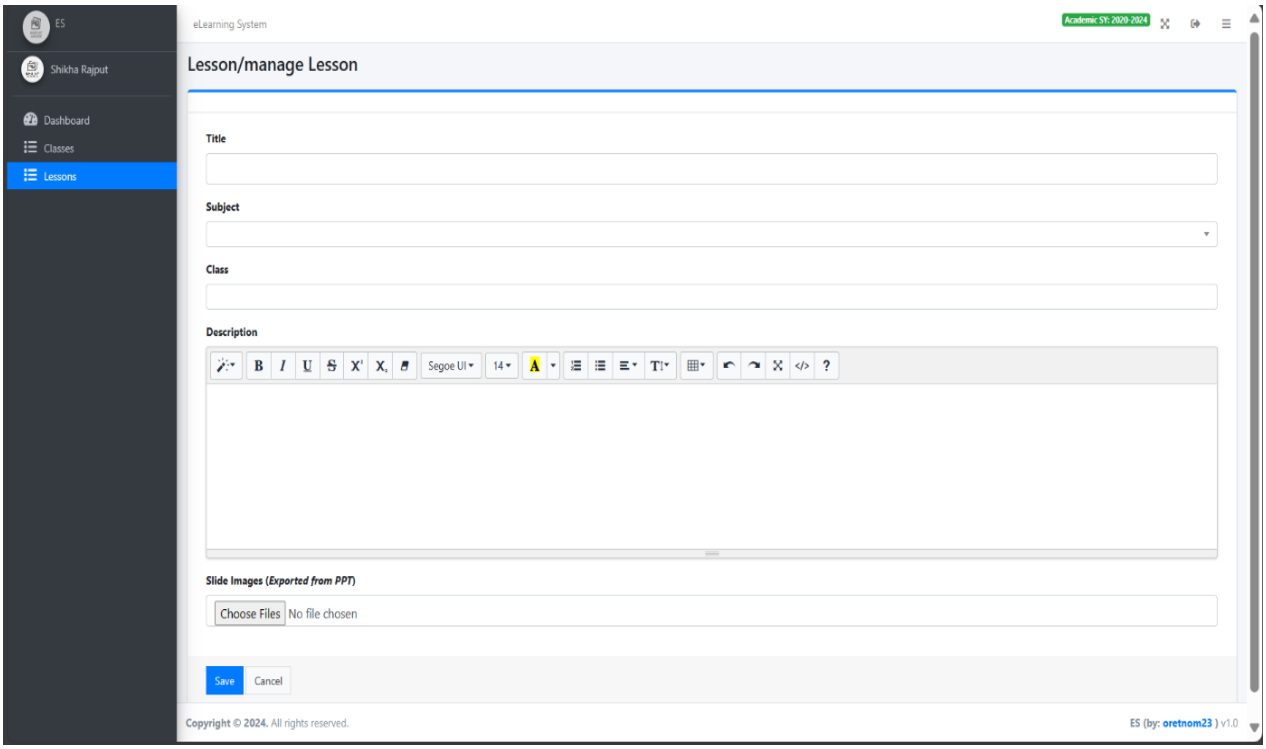
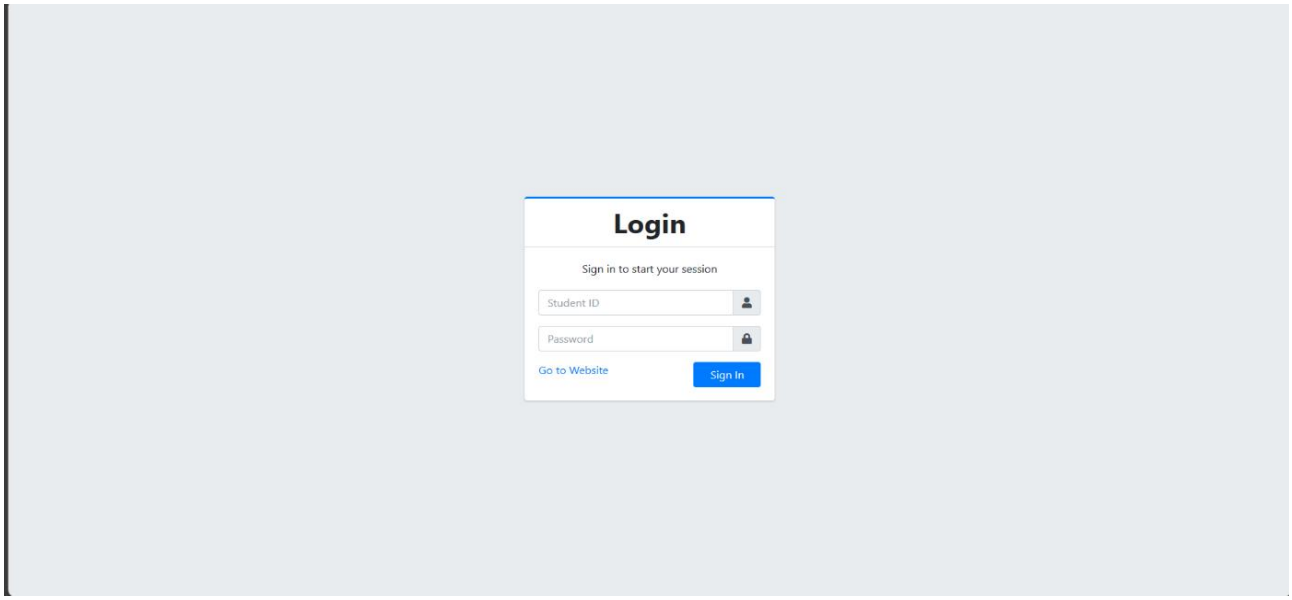


Fig 5.28

5.29 Snapshot of Student Module



5.29 Login of Student Module

5.30 Dashboard of Student Module

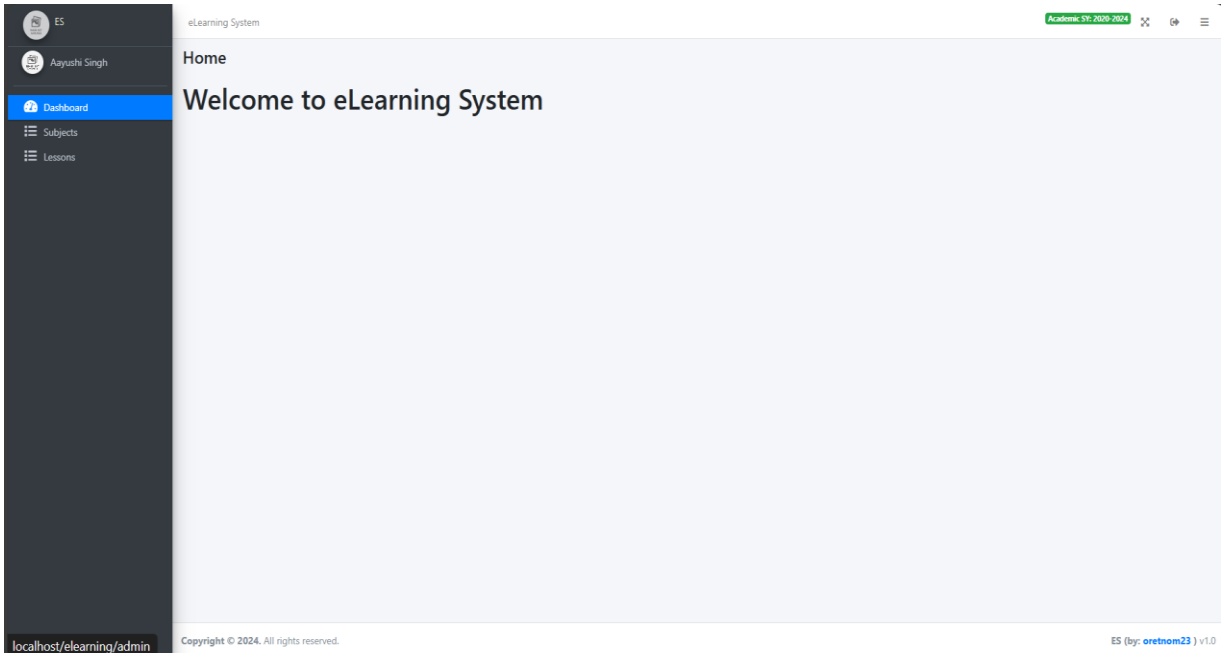


Fig : 5.30

5.31 Subject

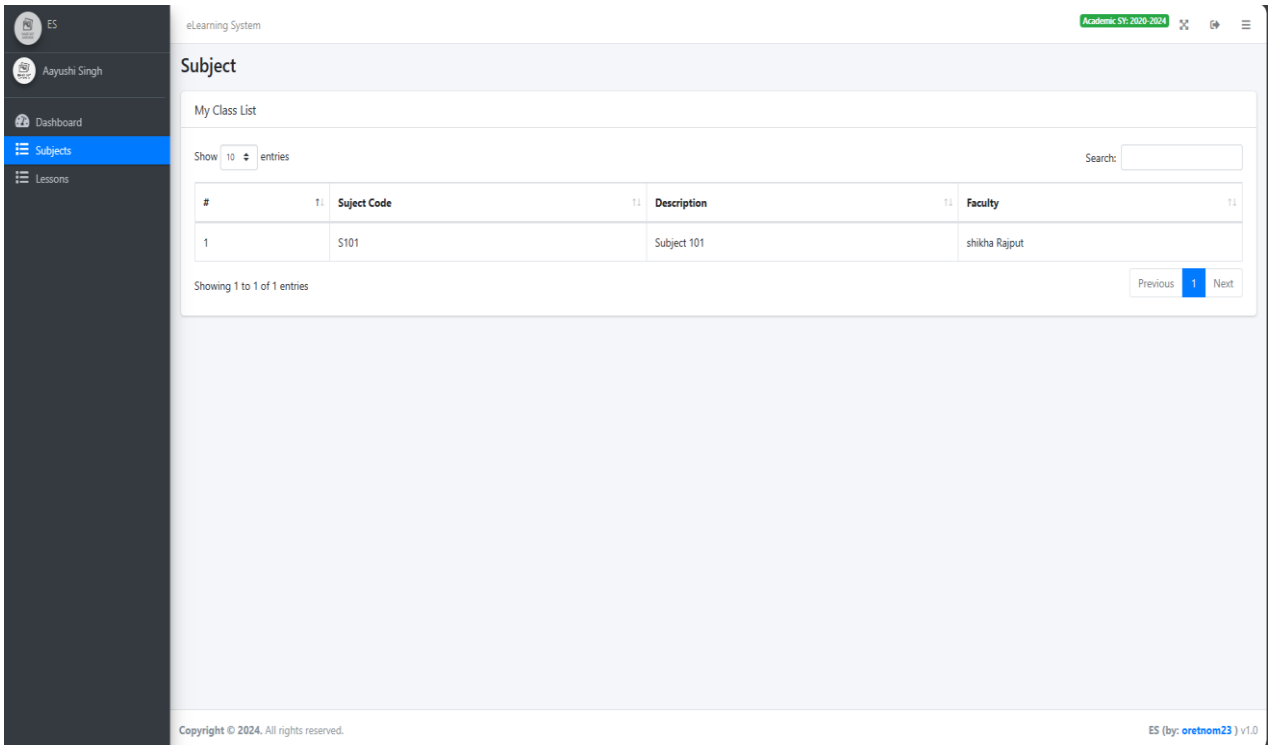


Fig : 5.31

CHAPTER 6

Testing and Implementation

6.1 Objective of Testing

Software testing is an investigation conducted to provide stakeholders with information about the quality of the product or service under test. Software testing can also provide an objective, independent view of the software to allow the business to appreciate and understand the risks of software implementation. Test techniques include, but are not limited to, the process of executing a program or application with the intent of finding software bugs (errors or other defects).

Software testing can be stated as the process of validating and verifying that a software program/application/product:

1. meets the requirements that guided its design and development;
2. works as expected; and
3. can be implemented with the same characteristics.

Software testing, depending on the testing method employed, can be implemented at any time in the development process. However, most of the test effort traditionally occurs after the requirements have been defined and the coding process has been completed having been shown that fixing a bug is less expensive when found earlier in the development process. Although in the Agile approaches most of the test effort is, conversely, on-going. As such, the methodology of the test is governed by the software development methodology adopted.

Different software development models will focus the test effort at different points in the development process. Newer development models, such as Agile, often employ

test driven development and place an increased portion of the testing in the hands of the developer, before it reaches a formal team of testers. In a more traditional model, most of the test execution occurs after the requirements have been defined and the coding process has been completed. Testing can never completely identify all the defects within software. Instead, it furnishes a *criticism* or *comparison* that compares the state and behaviour of the product against oracles—principles or mechanisms by which someone might recognize a problem. These oracles may include (but are not limited to) specifications, contracts, comparable products, past versions of the same product, inferences about intended or expected purpose, user or customer expectations, relevant standards, applicable laws, or other criteria.

Every software product has a target audience. For example, the audience for video game software is completely different from banking software. Therefore, when an organization develops or otherwise invests in a software product, it can assess whether the software product will be acceptable to its end users, its target audience, its purchasers, and other stakeholders. **Software testing** is the process of attempting to make this assessment.

6.2 Types of Testing

6.2.1 Black Box Testing

Black-box testing treats the software as a "black box"—without any knowledge of internal implementation. Black-box testing methods include: equivalence partitioning, boundary value analysis, all-pairs testing, fuzz testing, model-based testing, exploratory testing and specification-based testing.

- **Specification-based testing**: Specification-based testing aims to test the functionality of software according to the applicable requirements. Thus, the tester inputs data into, and only sees the output from, the test object. This level of testing usually requires thorough test cases to be provided to the tester, who then can simply verify that for a given input, the output value (or behavior), either "is" or "is not" the same as the expected value specified in the test case.

Specification-based testing is necessary, but it is insufficient to guard against certain risks.

- **Advantages and disadvantages**: The black-box tester has no "bonds" with the code, and a tester's perception is very simple: a code *must* have bugs. Using the principle, "Ask and you shall receive," black-box testers find bugs where

programmers do not. On the other hand, black-box testing has been said to be "like a walk in a dark labyrinth without a flashlight," because the tester doesn't know how the software being tested was actually constructed. As a result, there are situations when (1) a tester writes many test cases to check something that could have been tested by only one test case, and/or (2) some parts of the back-end are not tested at all.

Therefore, black-box testing has the advantage of "an unaffiliated opinion", on the one hand, and the disadvantage of "blind exploring", on the other

6.2.2 White Box Testing

White-box testing is when the tester has access to the internal data structures and algorithms including the code that implements these.

Types of white-box testing

The following types of white-box testing exist:

- API testing (application programming interface) - testing of the application using public and private APIs
- Code coverage - creating tests to satisfy some criteria of code coverage (e.g., the test designer can create tests to cause all statements in the program to be executed at least once)
- Fault injection methods - improving the coverage of a test by introducing faults to test code paths
- Mutation testing methods
- Static testing - All types

Test coverage

White-box testing methods can also be used to evaluate the completeness of a test suite that was created with black-box testing methods. This allows the software team to examine parts of a system that are rarely tested and ensures that the most important function points have been tested.[21]

Two common forms of code coverage are:

- *Function coverage*, which reports on functions executed

- *Statement coverage*, which reports on the number of lines executed to complete the test

They both return a code coverage metric, measured as a percentage.

6.2.3 Functional Testing

Functional testing refers to activities that verify a specific action or function of the code. These are usually found in the code requirements documentation, although some development methodologies work from use cases or user stories. Functional tests tend to answer the question of "can the user do this" or "does this particular feature work."

Non-functional testing refers to aspects of the software that may not be related to a specific function or user action, such as scalability or other performance, behavior under certain constraints, or security. Testing will determine the flake point, the point at which extremes of scalability or performance leads to unstable execution. Non-functional requirements tend to be those that reflect the quality of the product, particularly in the context of the suitability perspective of its users.

6.2.4 System Testing

System testing of software or hardware is testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. System testing falls within the scope of black box testing, and as such, should require no knowledge of the inner design of the code or logic.

As a rule, system testing takes, as its input, all of the "integrated" software components that have successfully passed integration testing and also the software system itself integrated with any applicable hardware system(s). The purpose of integration testing is to detect any inconsistencies between the software units that are integrated together (called *assemblages*) or between any of the *assemblages* and the hardware. System testing is a more limited type of testing; it seeks to detect defects both within the "inter-assemblages" and also within the system as a whole.

6.3 Various level Of Testing

Before implementation the system is tested at two levels:

1. Level 1
2. Level 2

6.3.1 Level 1 Testing (Alpha Testing)

Alpha testing is simulated or actual operational testing by potential users/customers or an independent test team at the developers' site. Alpha testing is often employed for off-the-shelf software as a form of internal acceptance testing, before the software goes to beta testing.

6.3.2 Level 2 Testing (Beta testing)

Beta testing comes after alpha testing and can be considered a form of external user acceptance testing. Versions of the software, known as beta versions, are released to a limited audience outside of the programming team. The software is released to groups of people so that further testing can ensure the product has few faults or bugs. Sometimes, beta versions are made available to the open public to increase the feedback field to a maximal number of future users.

6.3.3 Module Testing

Module testing, also known as integration testing, is a software testing method that focuses on testing the interactions between different modules or components of a software system. In the context of an expense tracker, module testing can help ensure that the different modules of the system are working together correctly and as intended.

Here are some steps for implementing module testing in an expense tracker:

1. Identify the modules to be tested: Identify the different modules or components of the system that need to be tested, such as the user interface, database, and financial reporting modules.
2. Define the interfaces between modules: Define the interfaces between the modules, specifying the expected input, output, and behaviour of each module.
3. Write test cases: Write test cases for each module, specifying the expected input, output, and behaviour of the module when interacting with other modules.
4. Implement test code: Implement the test code using a module testing framework.
5. Run the tests: Run the tests and compare the actual results with the expected results.

6. Analyse and fix issues: Analyse any issues that arise during testing, and fix the code as necessary.
7. Repeat testing: Repeat the testing process for each new release or update of the expense tracker.

By implementing module testing in an expense tracker, you can ensure that the different modules of the system are working together correctly and as intended, and that any issues are identified and fixed early on in the development process. This can help improve the overall quality and reliability of the system, and reduce the risk of bugs and errors.

It's important to note that module testing should be performed after unit testing, as it helps to identify issues that may arise when modules are integrated together.

6.3.4 Recovery and Security

A forced system failure is induced to test a backup recovery procedure for file integrity. Inaccurate data are entered to see how the system responds in terms of error detection and protection. Related to file integrity is a test to demonstrate that data and programs are secure from unauthorized access.

6.3.5 Usability Documentation and Procedure:

The usability test verifies the user-friendly nature of the system. This relates to normal operating and error-handling procedures.

6.4 Quality Assurance

Though controversial, software testing is a part of the software quality assurance (SQA) process. In SQA, software process specialists and auditors are concerned for the software development process rather than just the artifacts such as documentation, code and systems. They examine and change the software engineering process itself to reduce the number of faults that end up in the delivered software: the so-called defect rate.

What constitutes an "acceptable defect rate" depends on the nature of the software; A flight simulator video game would have much higher defect tolerance than software for an actual airplane.

Although there are close links with SQA, testing departments often exist independently, and there may be no SQA function in some companies.

Software testing is a task intended to detect defects in software by contrasting a computer program's expected results with its actual results for a given set of inputs. By contrast, QA (quality assurance) is the implementation of policies and procedures intended to prevent defects from occurring in the first place.

6.5 System Implementation

During the implementation stage the system in physically created. Necessary programs are coded, debugged and documented. A new hardware is selected, ordered and installed.

6.6 Installation

The application installation script have to be generated from the current server where the application source code saved and installed in the main server from where the application is to be run. This was done using a special code, which generates all SQL-Statements to insert preliminary data (like menu entries, code in code directories etc) at server and the operational modules of the application made available to the end user successfully.

6.7 Implementation

The system is still under construction few report are yet to me made after that this system will be implanted at client side. Users will be given a training to use the package and special work shop is conducted by the courier for the purpose and according to their feedback the change implanted in the software.

CONCLUSION

Our E-Learning will be used for many important works. It has mainly two users, Teacher, Student. A presenter will conduct a Classrooms for, Students which will attend the classroom from anywhere in the world. When a classroom is started, teacher can conduct classes, upload notes, create assignments, can teach online for students in the classroom. As a teacher he can add new students to the classroom. Teacher can create topic for the classroom that will give an outline about the classroom. When participants enters in classroom , he can attend the classroom, he is able to download the resources submitted by teacher, he can answer the doubt of other student also, and also he can see the responses submitted by other students to that doubt he can also follow various numbers of teachers on their permission. He can download the matter submitted by the teachers. Both teacher and student will receive notification for the various activities happening. Report will be generated for the assignments.

7.1 Discussion and Conclusion

Although my ambition was to achieve a complete system that will have a highly accuracy. I have managed to develop a system and a guideline to on how an application can be developed for course management system based on web. I have face with many errors and fixed it. I designed this application interface is simply and well organized so that the user can easily cooperate with it. I tried to improve its accuracy and keep it acceptable by user. I tried my best for best result and keep user friendly. And I hope the user will be benefitted.

7.2 Outcome

- I learned how to architect a web application.
- Doing this project I got to know about many new things and I did a proper use of
- internet.
- And I learned how to complete the work according to the plan.

7.3 Limitation

- There have no major limitation in this project. I finished the project as I
- supervised but if there are other user requirements then this will be developed
- according to the requirements.
- User can’t modify any types of data in this application.

7.4 Scope of Development for Future Suggested Work

The system has been developed with future development possibilities in consideration. I hope I could promote the system and reduce the limitation of the system.

This project also has the future scope of enhancement such as:

- More attractive user interface to make it more user friendly.
- Can add more feature.
- The reliability of the web application can be increase.
- I intend to implement an artificial intelligence.

REFERENCE

1. Online Course Management System .Net Project - 1000 Projects
2. (PDF) The Development of a Final Year Project Management System for Information Technology Programmes (researchgate.net)
3. Use Case Diagram For Student Information System Project (meeraacademy.com)
4. Laravel - Wikipedia
5. How Laravel web development can grow business? (techliance.com)
6. S. Bsiri, M. Geierhos, and C. Ringlstetter, "Structuring E Learning search via local grammars," Advances in Natural Language Processing an Applications, pp. 201, 2008.
7. M. Mansourvar and N. Y. Mohd, "E learning portal as a knowledge management system in the universities," World Academy of Science Engineering and Technology, vol. 70, pp. 968-974, 2010.
8. M. Gangle, "The only way is up? Employment protection and E Learning mobility among recent entrants to European labour markets," European Sociological Review, vol. 19, pp. 429, 2007.
9. E. Galanki, "The decision to recruit online: a descriptive study," Career Development International, vol. 7, pp. 243-251, 2002

BIBLOGRAPHY

1. Biech, E. (2014). ASTD handbook: The definitive reference for training & development (2nd ed.). Alexandria, VA: ASTD Press.
2. Clark, R. (2014). Evidence-based training methods: A guide for training professionals (2nd ed.). Alexandria, Va.: ASTD Press.
3. Dirksen, J. (2015). Design for how people learn (2nd ed.). Berkeley, California: New Riders.
4. Clark, R. C., & Mayer, R. E. (2016). e-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning. John Wiley & Sons.
5. Garrison, D. R., & Kanuka, H. (2004). Blended Learning: Uncovering its transformative potential in higher education. The Internet and Higher Education, 7(2), 95-105.
6. Siemens, G. (2005). Connectivism: A learning theory for the digital age. International Journal of Instructional Technology and Distance Learning, 2(1), 3-10.
7. Bates, T. (2019). Teaching in a Digital Age: Guidelines for Designing Teaching and Learning. Tony Bates Associates Ltd.
8. Rosenberg, M. J. (2006). Beyond e-Learning: Approaches and Technologies to Enhance Organizational Knowledge, Learning, and Performance. John Wiley & Sons.
9. Allen, M. W. (2003). Michael Allen's Guide to e-Learning: Building Interactive, Fun, and Effective Learning Programs for Any Company. John Wiley & Sons.
10. Downes, S. (2005). E-learning 2.0. eLearn Magazine, 2005(10).
11. Pappas, C. (2018). The Instructional Design Book: A Comprehensive Guide to Designing Successful e-Learning Courses. CreateSpace Independent Publishing Platform.
12. Bates, A. W., & Sangrà, A. (2011). Managing Technology in Higher Education: Strategies for Transforming Teaching and Learning. John Wiley & Sons.
13. Rieber, L. P., & Dempsey, J. V. (2011). Trends and Issues in Instructional Design and Technology. Pearson.