ONLINE NITK WEBSITE

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Contents

Abstract

A Website is a collection of web pages and related content that is identified by a common domain name. College Website is a web application that can be used to covey information to general audience and helps to handle various academic as well non-academic activites of the college using a secure role-based login system in order to reduce manpower utilization. This system can be accessed by students, faculties as well as administration for various purposes. The major goal of creating a role-based Student Activity Management System is to provide a simple and safe manner to manage their numerous activities based on their respective privileges such as add, delete, and update. We have built a role-based access paradigm in which a user can access the approved sites and modules based on their status as a student, or an faculty.

1 INTRODUCTION

1.1 Purpose of project

The purpose of NITK website, which is mainly emphasizing on CSE and IT department, is to provide a facility to display all the department related information at a single place. This project also helps us to provide details of all faculty, staff members and students in one place for convenience of everyone. Also important notice and announcements can displayed on the website. The main advantage of the website is to reduce the errors while insertion data in the records. It also provides easy access to the data. This project tries to create the NITK CSE and IT departments website so that it is useful for many visitors to know what we are and what our student are doing.

1.2 System Analysis

It is a process of collecting and interpreting facts, identifying the problems, and decomposition of a system into its components. System analysis is conducted for the purpose of studying a system or its parts in order to identify its objectives. It is a problem solving technique that improves the system and ensures that all the components of the system work efficiently to accomplish their purpose.Two of the steps are:

- Identification of need
- Preliminary investigation

1.3 Identification of need

1.3.1 Performance of the system:

Performance of the system depends upon:

- System design
- Tools
- Coding

The system should be FAST, ACCURATE and RELIABLE.

1.4 Preliminary investigation

- Evaluation of project request is major purpose of preliminary investigation.
- It is the collecting information that helps committee members to evaluate merits of the project request and make judgment about the feasibility of the proposed projects.

Preliminary investigation has three parts:

- Request clarification
- Feasibility study
- Request approval

Feasibility study is the most important in preliminary investigation,lets's discuss it in detail.

1.5 Feasibility study

A feasibility study is part of the initial design stage of any project/plan. It is conducted in order to objectively uncover the strengths and weaknesses. It is a measure of the software product in terms of how much beneficial product development will be for the organization in a practical point of view. Feasibility study is carried out based on many purposes to analyze whether software product will be right in terms of development, implantation, contribution of project to the organization etc.

1.5.1 Types of Feasibility Study :

The feasibility study mainly concentrates on below five mentioned areas. Among these Economic Feasibility Study is most important part of the feasibility analysis and Legal Feasibility Study is less considered feasibility analysis.

1. ***TechnicalFeasibility*** **:**In Technical Feasibility current resources both hardware software along with required technology are analyzed/assessed to develop project. This technical feasibility study gives report whether there exists correct required resources and technologies which will be used for project development.

2. ***OperationalFeasibility*** **:**In Operational Feasibility degree of providing service to requirements is analyzed along with how much easy product will be to operate and maintenance after deployment. Along with this other operational scopes are determining usability of product, Determining suggested solution by software development team is acceptable or not etc.

3. ***EconomicFeasibility*** **:**In Economic Feasibility study cost and benefit of the project is analyzed. Means under this feasibility study a detail analysis is carried out what will be cost of the project for development which includes all required cost for final development like hardware and software resource required, design and development cost and operational cost and so on. After that it is analyzed whether project will be beneficial in terms of finance for organization or not.

4. ***LegalFeasibility*** **:** In Legal Feasibility study project is analyzed in legality point of view. This includes analyzing barriers of legal implementation of project, data protection acts or social media laws, project certificate, license, copyright etc. Overall it can be said that Legal Feasibility Study is study to know if proposed project conform legal and ethical requirements.

1.5.2 Feasibility Study Process :

The below steps are carried out during entire feasibility analysis.

- Information assessment
- Information collection
- Report writing
- General information

1.5.3 Need of Feasibility Study :

Feasibility study is so important stage of Software Project Management Process as after completion of feasibility study it gives a conclusion of whether to go ahead with proposed project as it is practically feasible or to stop proposed project here as it is not right/feasible to develop or to think/analyze about proposed project again. Along with this Feasibility study helps in identifying risk factors involved in developing and deploying system and planning for risk analysis also narrows the business alternatives and enhance success rate analyzing different parameters associated with proposed project development.

2 VISION

Our main aim is to make it too easy for users to get useful information from NITK website ,mainly focussing on CSE and IT deparments ,so that value of technology will increase day by day.Also by looking the way we created this project,students will get motivate to work more in the field of web development.

3 Technology Used

3.1 Front end

- **HTML5:** Hypertext Markup Language (HTML) is the standard markup language for documents designed to be displayed in a web browser. It can be used by other technologies such as CSS and javascript. It is used to design the skelton of a webpage.
- **CSS:** Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a mark-up language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.
- **Jinja 2 Template:** Jinja is a fast, expressive, extensible templating engine. Special placeholders in the template allow writing code similar to Python syntax. Then the template is passed data to render the final document.

3.2 Backend

- **Python Flask framework:** The system backend is developed using Flask which is a micro webframework written in Python. It is classified as a microframework because it does not require particular tools or libraries. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions.

3.3 Database

- **SQLAlchemy:** The system database is built using SQLAlchemy, a Python SQL toolkit and Object Relational Mapper that gives application developers the full power and flexibility of SQL. SQL was chosen as the database as it suits well to the relational model of our application.

4 Software Development Life Cycle

SDLC is a process followed for a software project, within a software organization. It consists of a detailed plan describing how to develop, maintain, replace and alter or enhance specific software. The life cycle defines a methodology for improving the quality of software and the overall development process.

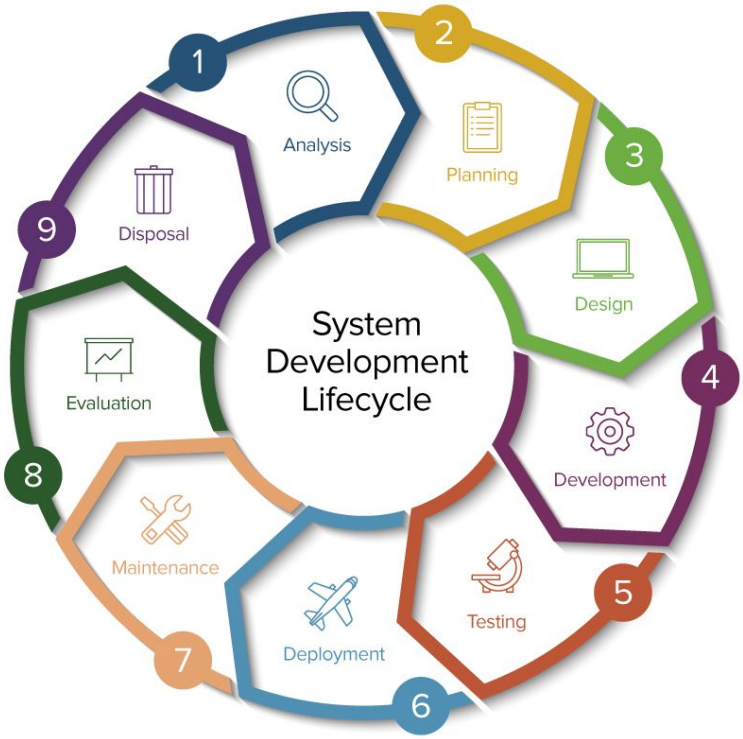

Figure 1: SDLC: Software Development Life Cycle

The Software Development Life Cycle (SDLC) refers to a methodology with clearly defined processes for creating high-quality software. SDLC methodology focuses on the following phases of software development:

- Requirement analysis
- Planning
- Design
- Development
- Testing
- Deployment
- Maintenance
- Evaluation
- Disposal

5 Waterfall model

Every software development project requires a selection of suitable SDLC approach to be followed based on the internal and external factors. In this project we have used waterfall model because of the following characteristics of project:

- The Waterfall model is very easy to manage due to the rigidity of the model, which suits our purpose
- Requirements are well documented and fixed.
- Technical stack is well defined.
- There are no ambiguous requirements.

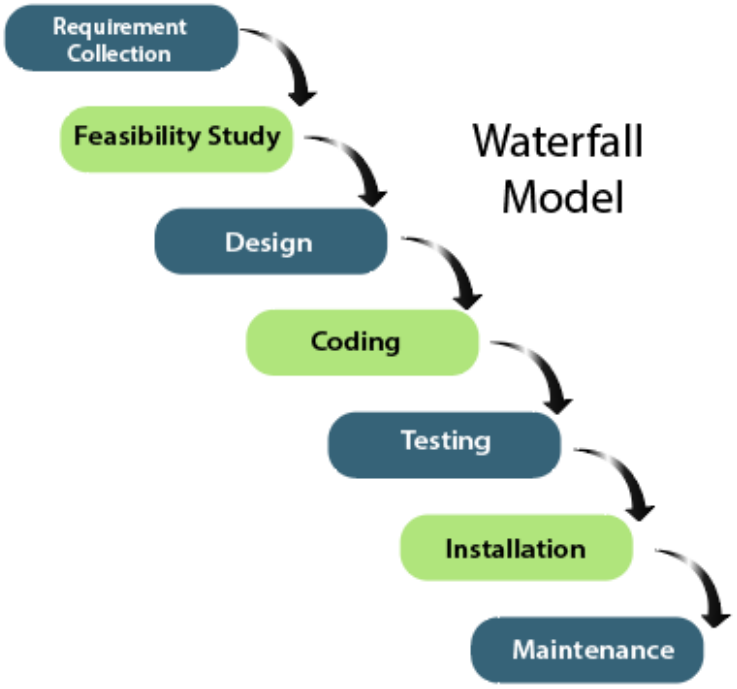

Figure 2: Waterfall Model

5.1 Requirement gathering and Analysis

Requirement Analysis, also known as Requirement Engineering, is the process of defining user expectations for a new software being built or modified. In software engineering, it is sometimes referred to loosely by names such as requirements gathering or requirements capturing. We have gathered information from our existing institute website i.e. https://nitk.ac.in.

5.2 System Design

UML Diagrams are made

1. Flowchart
2. ER Diagram
3. UseCase diagram

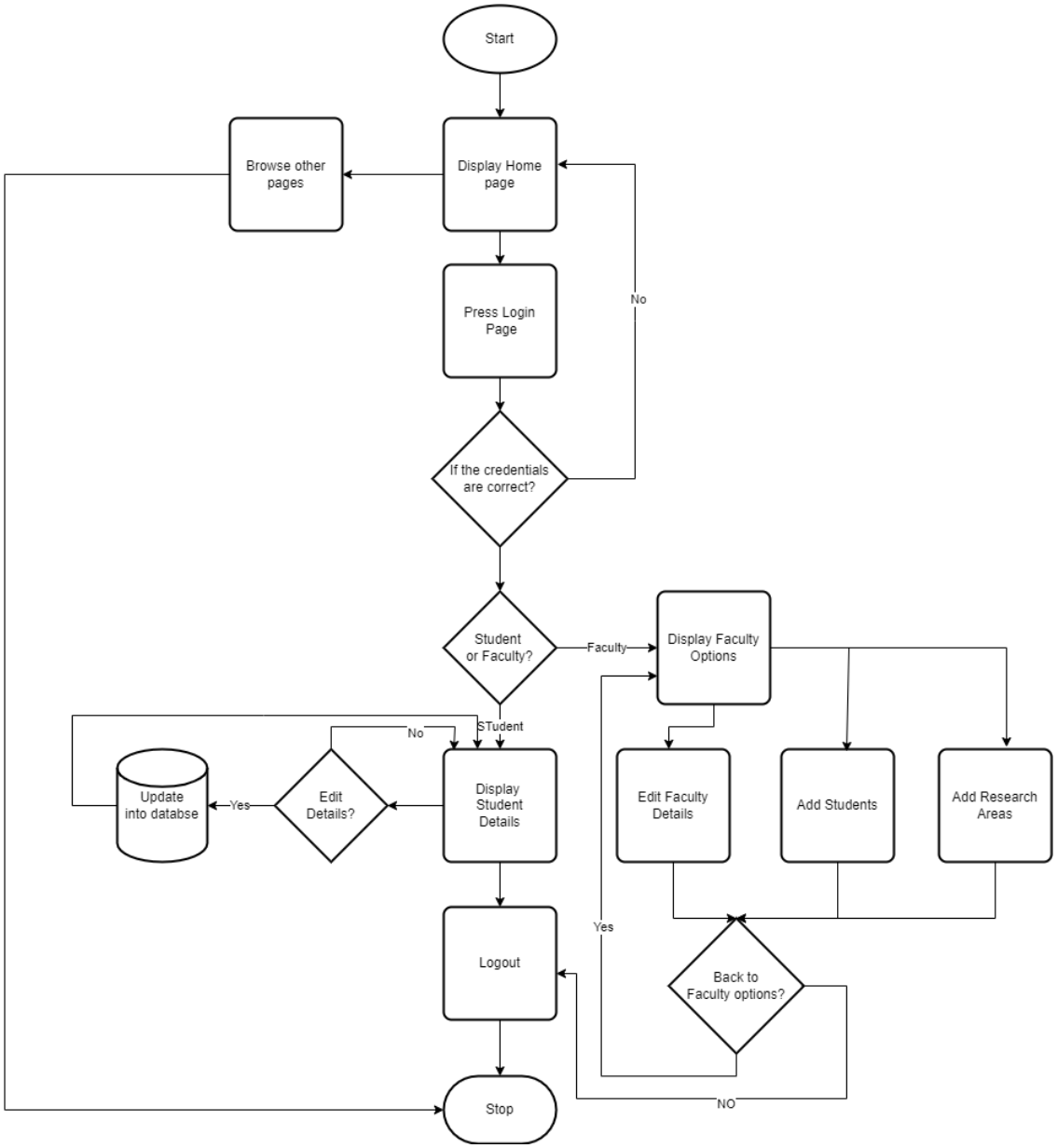

Figure 3: Flow Chart Diagram

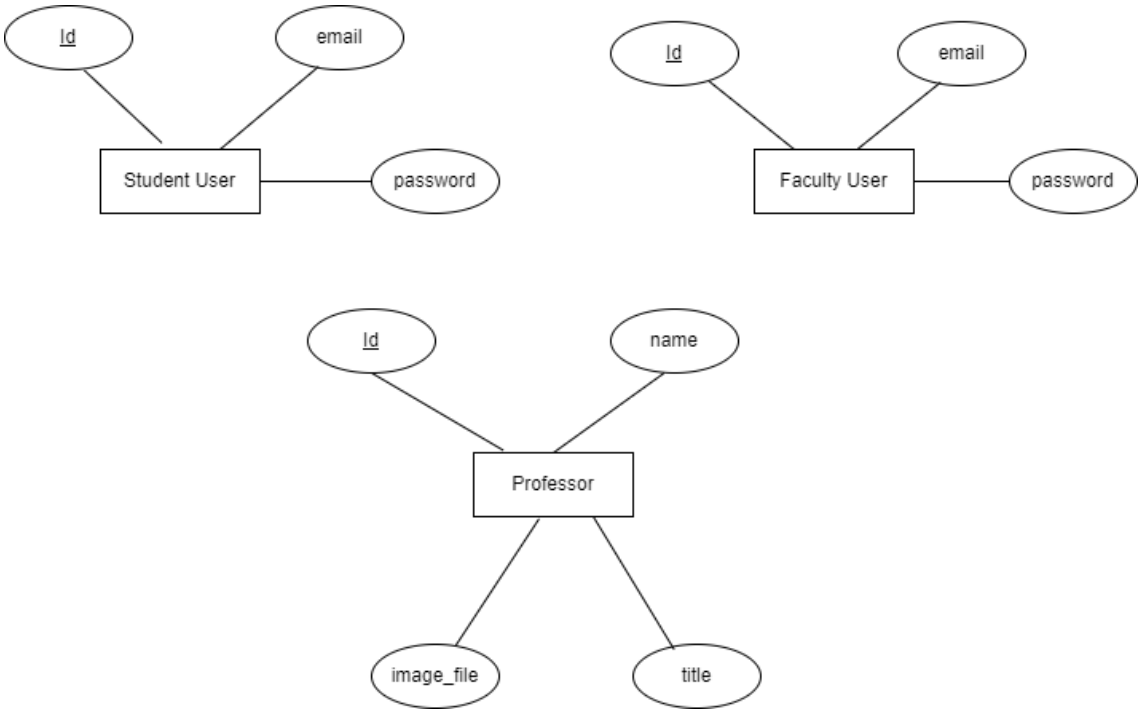

Figure 4: ER Diagram

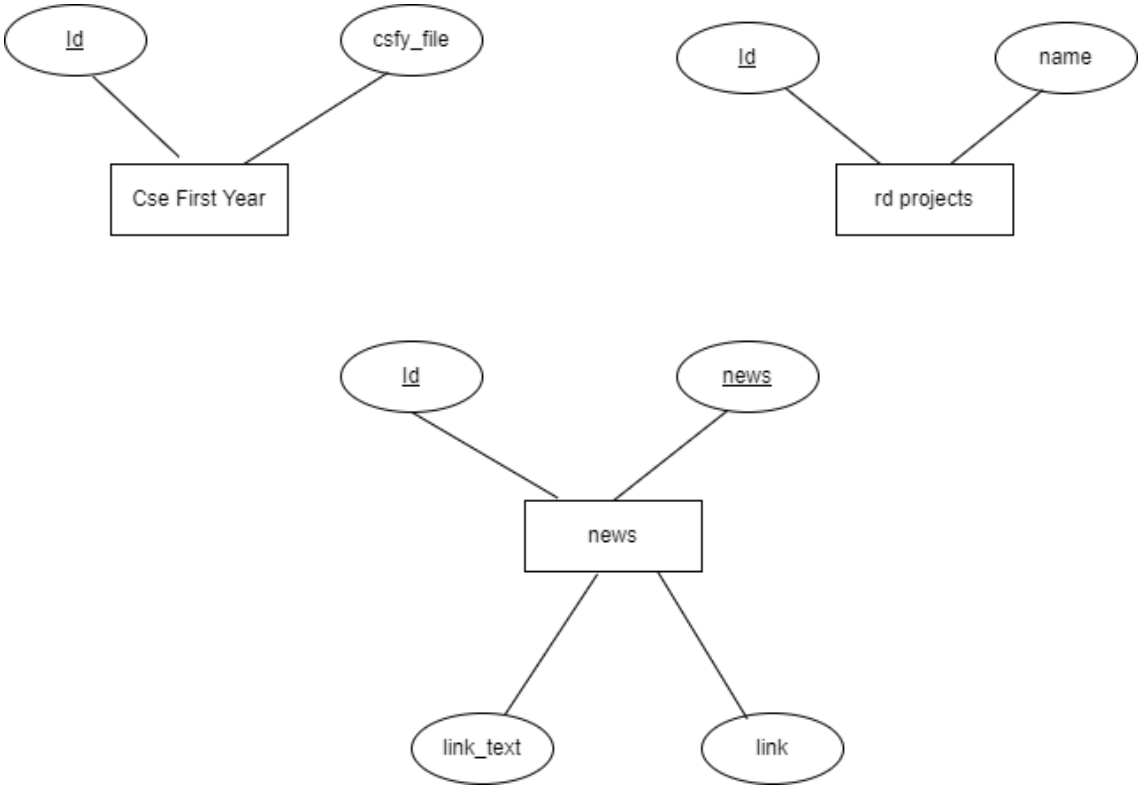

Figure 5: ER Diagrams

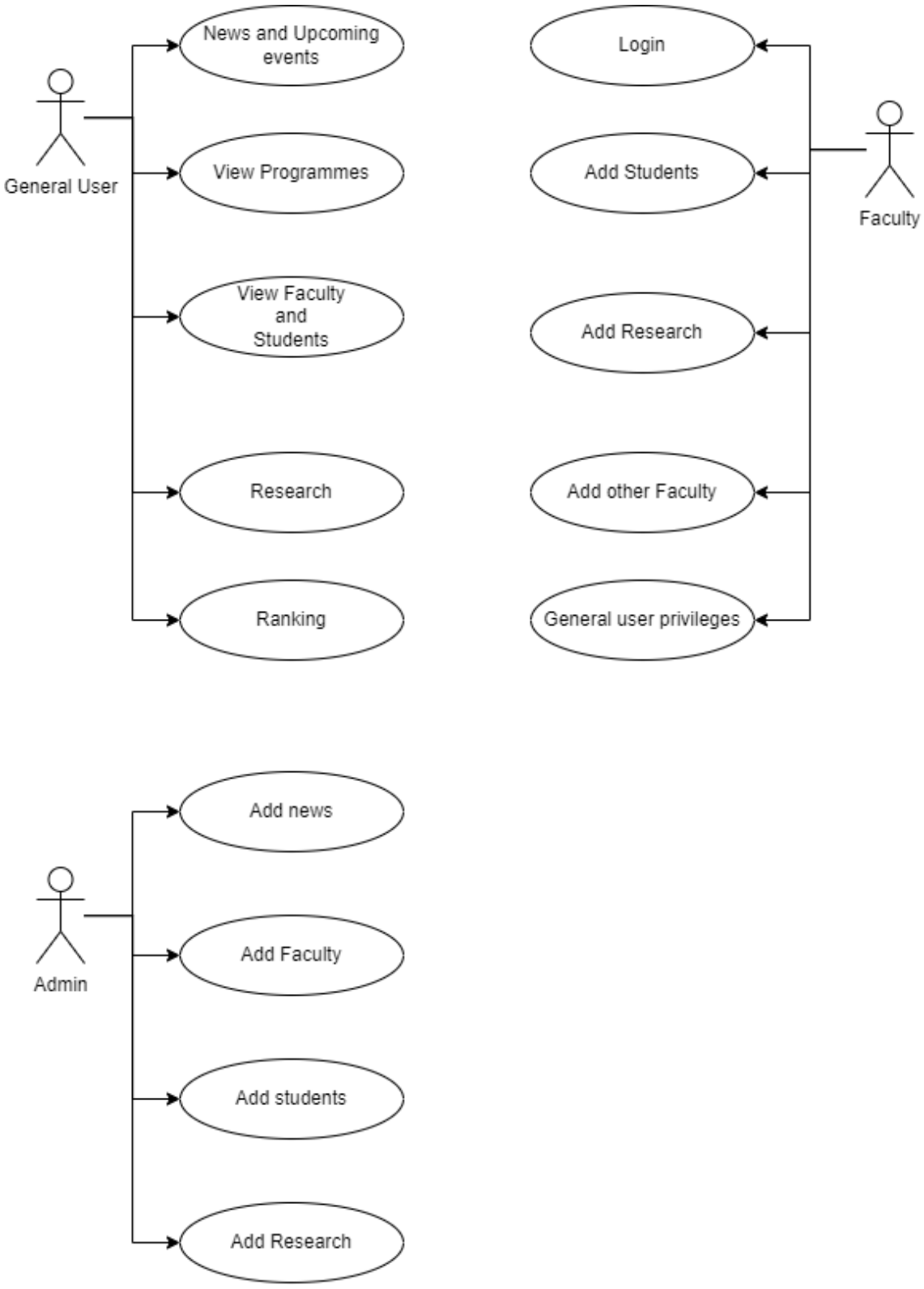

Figure 6: UseCase Diagram

5.3 Implementation

- Platform used for Development- PyCharm
- Browser- Google Chrome, Firefox, etc
- Version Control- Github for Desktop
- Front end Development
    1. HTML 5(to structure a web page and its content)
    2. CSS (for styling)
    3. Jinja 2 templates(template inheritance)
- Back end Development-Python Flask Framework(Web application framework)
- Database- SQL Alchemy(SQL toolkit for object relation mapping)

5.4 Integration and Testing

- Following the implementation phase, the various modules and components generated by various team members are merged into a single primary module that meets all of the requirements.
- After the integration, the main module is tested for proper operation.

5.5 Maintenance

- We made some changes after building a working site.
- Some changes that we made are
    1. The entire site's theme has been modified to make it more appealing and user-friendly.
    2. Created some more tables to include some additional needs.
    3. Authentication is improved to make it more reliable.

Figure 7: Planning Diagram

6 Testing

6.1 System Testing

It is a very essential issue in a system development. It is a type of software testing that is performed on a complete integrated system to evaluate the compliance of the system with the corresponding requirements.

6.2 White Box Testing

It is software testing technique in which internal structure, design and coding of software are tested to verify flow of input-output and to improve design, usability and security. In white box testing, code is visible to testers so it is also called Clear box testing.

6.3 Black Box Testing

It is a method of software testing that examines the functionality of an application without peering into its internal structures or workings. This method of test can be applied virtually to every level of software testing: unit, integration, system and acceptance. It is sometimes referred to as specification-based testing.

6.4 Validation Testing

The process of evaluating software during the development process or at the end of the development process to determine whether it satisfies specified customer requirements.

7 Interface

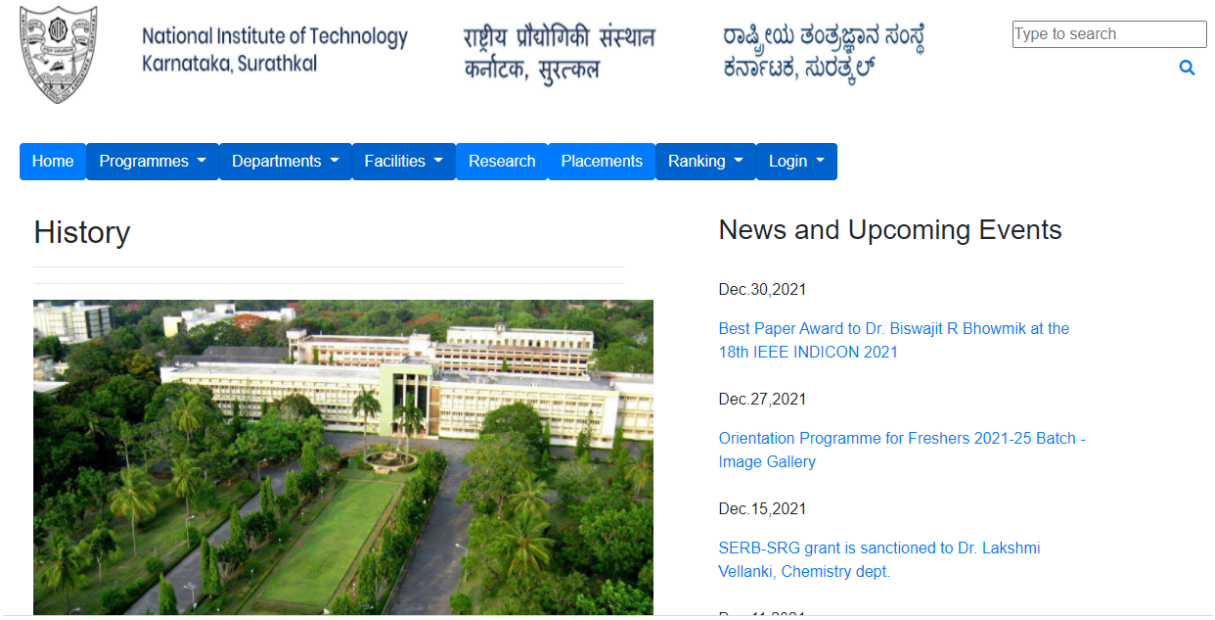

Figure 8: Front Page

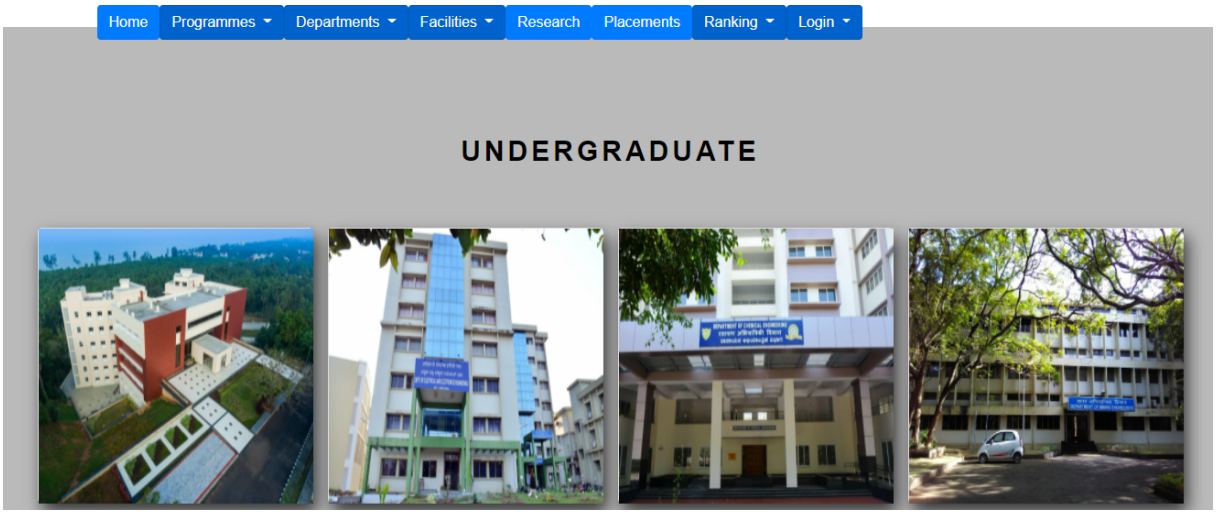

Figure 9: Under Graduates

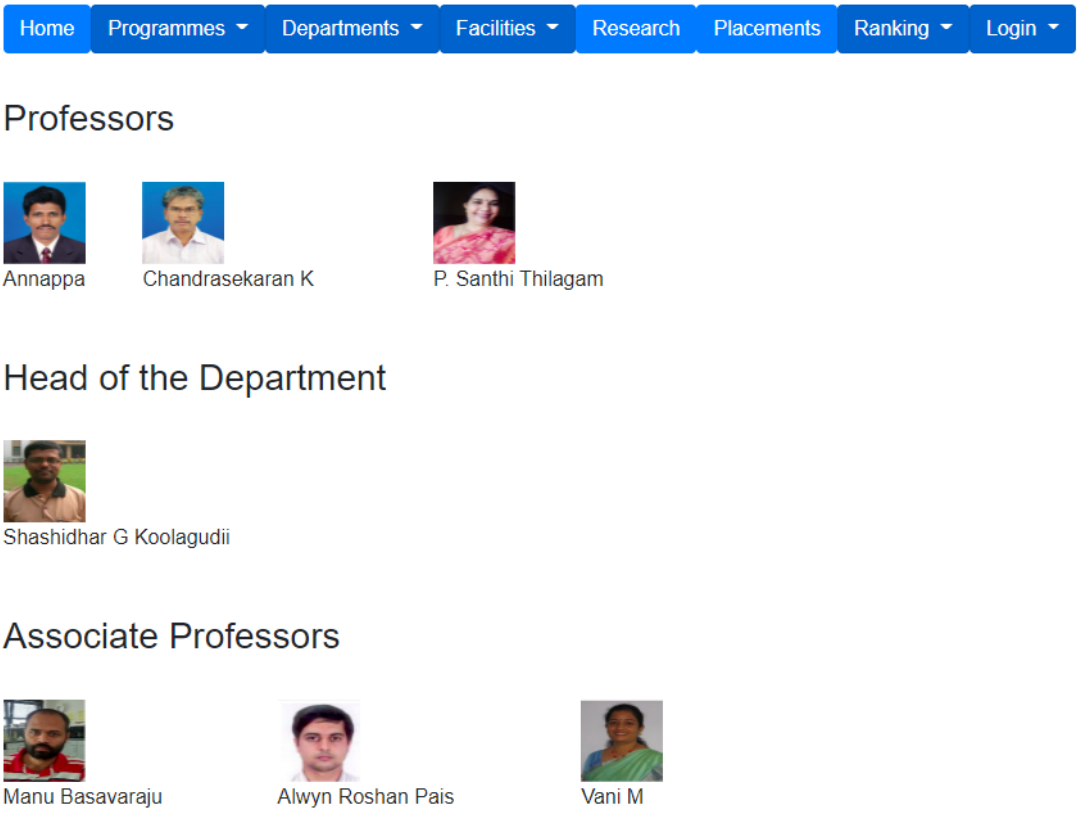

Figure 10: CSE Department Faculties

Figure 11: Faculty Login Page

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