PROJECT REPORT

ON

FEE DASHBOARD USING
PYTHON STREAMLIT

Centurion University of Technology & Management
Andhra Pradesh

A PROJECT REPORT

Submitted by

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in partial fulfillment for the award of the

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in

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SCHOOL OF ENGINEERING AND TECHNOLOGY

BHUBANESWAR CAMPUS

CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT ANDHRA PRADESH

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SPECIMEN CERTIFICATE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
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BONAFIDE CERTIFICATE

Certified that this project report **Fees Dashboard Using Python Streamlit** is the bonafide work of "**V. Supreethi, N. Venkata Akhil, T. TarunKumar, B. Harshini, B. Harini** who carried out the project work under my supervision. This is to further certify to the best of my knowledge, that this project has not been carried out earlier in this institute and the university.

Mr. Amit Kumar
Professor of Computer Science and Engineering

Certified that the above mentioned project has been duly carried out as per the norms of the college and statutes of the university.

Dr.Subrat Kumar Parida

HEAD OF THE DEPARTMENT / DEAN OF THE SCHOOL
Professor of Computer Science and Engg

DEPARTMENT SEAL

DECLARATION

I hereby declare that the project entitled “Fees Dashboard using Python Streamlit” submitted for the “Minor Project” of 6th semester B. Tech in Computer Science and Engineering is my original work and the project has not formed the basis for the award of any Degree / Diploma or any other similar titles in any other University / Institute.

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I would be failing in my duty if I don't acknowledge the cooperation rendered during various stages of image interpretation by

I am highly grateful to who evinced keen interest and invaluable support in the progress and successful completion of my project work.

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LIST OF ACROYNMS

1. SRS: Software Requirements Specification
2. BTech: Bachelor of Technology
3. BBA: Bachelor of Business Administration
4. BSc: Bachelor of Science

LIST OF FIGURES

ABSTRACT

The Fee Dashboard project for Centurion University aims to revolutionize fee management processes through the development and implementation of a web-based application tailored for efficient fee administration. This transformative solution addresses challenges associated with manual fee management, offering a centralized platform for students and administrators to streamline fee-related activities.

The project encompasses the creation of two primary interfaces: one for regular students and another for administrators. The Dynamic Fee Dashboard integrates seamlessly with the university's database for student information. It aims to enhance transparency, reduce administrative overhead, and improve overall fee management processes.

This document serves as the Software Requirements Specification (SRS) for the Dynamic Fee Dashboard project, providing comprehensive guidelines for developers, testers, and administrators involved. It outlines specific requirements, functionalities, and non-functional aspects of the system, ensuring alignment with Centurion University's objectives. Through this initiative, Centurion University seeks to enhance fee management processes and offer a superior user experience for both students and administrators.

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CHAPTER – 1 INTRODUCTION

1.1 Identification:

The scope of the Dynamic Fee Dashboard for Centurion University encompasses the development and implementation of a web-based application tailored for efficient fee management. This includes but is not limited to user registration, login/logout functionality, personalized dashboards for regular students and administrators, secure payment options, robust search and filter capabilities, comprehensive reporting tools, and seamless integration with the university's existing systems. The project aims to address current challenges related to manual fee management, providing a scalable and user-friendly solution that enhances transparency, reduces administrative overhead, and improves the overall fee management process.

1.2 Project Overview:

Centurion University aims to enhance its fee management processes by implementing a Dynamic Fee Dashboard. This dashboard will serve as a centralized platform for students and administrators to efficiently manage and monitor fee-related activities.

1.3 Project Background:

Centurion University currently faces challenges related to manual fee management, resulting in delayed payments and difficulties in tracking student fee information. The Dynamic Fee Dashboard intends to streamline these processes, offering real-time insights, transparency, and improved user experiences for both students and administrators.

1.4 Objective:

The specific objectives of the Dynamic Fee Dashboard project are outlined. These objectives may include enhancing transparency, reducing administrative overhead, improving user experience, and streamlining fee management processes.

1.5 Significance:

Emphasizes the significance of the Dynamic Fee Dashboard project for Centurion University. It discusses the potential benefits such as real-time insights, improved transparency, and enhanced efficiency in fee management.

1.6 Scope:

Scope of the project defines the boundaries and extent of the Fee Dashboard's functionalities and features. It outlines the key components to be included in the system, such as admin login/logout functionality, personalized dashboards, secure payment reports, repoand integration with existing university systems.

1.7 System Overview:

The Dynamic Fee Dashboard is positioned as a transformative solution for Centurion University, centralizing and automating fee-related processes. The system consists of two primary interfaces: one for regular students and another for administrators. Regular students gain access to a personalized dashboard displaying fee-related information, payment history, and upcoming due dates. Administrators, on the other hand, are equipped with specialized dashboards for BTech, BBA, and BSc courses, along with advanced search and filter options, student details access, and payment management functionalities. The system interfaces with the university's database for student information, external payment gateways for transactions, and internal components to ensure seamless data flow.

CHAPTER – 2 FORMULATION OF PROJECT / IDENTIFICATION OF THE PROBLEM

2.1 Problem Statement:

The absence of a centralized and automated system results in administrative inefficiencies, lack of transparency, and potential errors. Additionally, the existing system lacks robust security measures to protect sensitive student data. There is a need for a dynamic, user-friendly, and secure fee management solution that streamlines fee-related processes for both students and administrators. The new system must offer real-time insights, simplified data retrieval, and role-based access to ensure efficient fee management while maintaining data privacy and security. This project aims to address these challenges by developing the Dynamic Fee Dashboard, a web-based application tailored to meet the specific requirements of Centurion University.

2.2 Background:

Centurion University currently relies on a manual fee management system, leading to several challenges. The manual processes result in delayed fee payments, making it difficult for the university to maintain consistent cash flow. Tracking and managing student fee information manually is time-consuming and prone to errors, causing administrative inefficiencies. The lack of a centralized system also hampers transparency and makes it challenging for students to access timely and accurate fee-related information. Moreover, the absence of robust security measures exposes sensitive student data to potential risks. These challenges highlight the urgent need for an automated, centralized, and secure fee management solution to streamline processes, enhance transparency, and improve overall efficiency for both students and university administrators.

2.3 Why does the Problem Matters:

The challenges faced in the fee management system have significant implications for

both the institution and its stakeholders.

1. Financial Stability: Delayed fee payments disrupt the university's financial planning and can lead to cash flow issues, affecting its ability to provide quality education and services.

2. Administrative Efficiency: Consume valuable administrative resources, diverting time and effort that could be better utilized in other critical areas of university management.

3. Transparency and Trust: A lack of transparency in fee management erodes trust among students and parents, potentially affecting the university's reputation and enrollment rates.

4. Data Security and Privacy: Without robust security measures, sensitive student data is at risk of unauthorized access, potentially leading to privacy breaches and legal implications.

5. Operational Costs: Inefficient manual processes can lead to increased operational costs over time, as more resources are needed to manage and maintain the existing system.

Addressing these challenges through the development and implementation of the Fee Dashboard is crucial to ensuring financial stability, improving administrative efficiency, enhancing transparency and trust, safeguarding data privacy, enhancing student experience, and optimizing operational costs for Centurion University.

2.4 Current Technology Challenges:

1. **Manual Processes:** The existing fee management system relies heavily on manual processes, leading to delays, errors, and inefficiencies in fee collection and management.

2. Data Discrepancies: Without a centralized system, there's a risk of data discrepancies between various records, leading to inconsistent information and potential errors.

4. Security Concerns: The absence of robust security measures exposes sensitive student and financial data to potential risks, including unauthorized access and data breaches.

5. Operational Costs: Maintaining and managing the current system requires significant manual effort and resources, leading to increased operational costs over time.

Addressing these technology challenges is crucial for Centurion University to streamline its fee management processes, enhance data security, improve system scalability, and provide a better user experience for administrators and students.

CHAPTER 3 PROJECT WORK PART-I

3.1 Overview:

Centurion University aims to enhance its fee management processes by implementing a Dynamic Fee Dashboard. This dashboard will serve as a centralized platform for administrators to efficiently manage and monitor fee-related activities. This includes but is not limited to user registration, login/logout functionality, personalized dashboards for regular administrators, robust search and filter capabilities, comprehensive reporting tools, and seamless integration with the university's existing systems. The project aims to address current challenges related to fee management, providing a scalable and user-friendly solution that enhances transparency, reduces administrative overhead, and improves the overall fee management process.

3.2 Software Tools and Technologies:

The project employs a strategic combination of Python programming language for overall development, python libraries including Pandas and Plotly . Streamlit serves as the pivotal framework, facilitating the creation of intuitive and interactive user interfaces for seamless engagement with Fees DashBoard.

3.2.1 Python Programming Language:

Python is a high-level, interpreted programming language known for its readability and simplicity. It supports multiple paradigms and has a vast standard library, making it versatile for various applications. Python's dynamic typing and automatic memory management contribute to rapid development, and its extensive community fosters a wealth of resources for developers.

3.2.2 Pandas:

Pandas is a popular Python library for data manipulation and analysis. It provides data structures like DataFrame and Series that are flexible and efficient for handling structured data.

With its powerful tools, you can easily read, write, and manipulate data from various sources like CSV files, Excel spreadsheets, and databases. Pandas offers functions for data cleaning, transformation, and aggregation, making it easier to prepare data for analysis. It integrates well with other libraries like NumPy and Matplotlib, allowing for seamless data processing and visualization. Its indexing and slicing capabilities enable efficient data selection and filtering. Additionally, Pandas supports time-series data operations, making it suitable for financial and temporal data analysis. The library also provides tools for handling missing data, enabling users to fill, drop, or interpolate missing values. With its rich set of functionalities, Pandas has become an essential tool for data scientists and analysts working with tabular data in Python.

3.2.3 Plotly:

Plotly is a versatile Python library that enables interactive data visualization. It offers a range of chart types like line, scatter, bar, and pie charts, as well as 3D plots and maps. Users can create rich, interactive plots with features like zooming, panning, and hovering to explore data dynamically. Plotly supports integration with popular frameworks like Dash for building web-based applications. It can be used in various environments including Jupyter Notebooks, web browsers, and standalone Python scripts. Plotly visualizations can be exported in multiple formats like HTML, PNG, and SVG. The library provides APIs for several programming languages, not just Python, making it widely accessible. With Plotly, users can customize plots extensively by adjusting colors, fonts, annotations, and more. Plotly also offers built-in tools for statistical analysis and data exploration, enhancing its utility for data scientists and analysts.

3.2.4 Website:

The website for the Department of Administration provides a comprehensive Fess Dashboard. It serves as a centralized platform for accessing crucial information related to Fees Structure of various Departments. Admin can navigate property details , student’s Academic Fees, Transportation Fees and Hostel Fees streamlining administrative processes and promoting informed decision-making. The site plays a pivotal role in enhancing accessibility and accountability in Fees of the Students.

3.2.5 Streamlit Framework:

Streamlit is a Python framework for creating web applications with minimal code. It simplifies the process of turning data scripts into interactive apps, enabling easy sharing of insights. With its intuitive syntax, it supports rapid development and real-time updates, making it ideal for data scientists and developers. Streamlit's focus is on simplicity and efficiency in building engaging and functional data-driven applications.

3.3 Streamlit Software:

Fig3.3 Streamlit Logo

Streamlit is a powerful and user-friendly Python framework designed for rapid development of web applications and interactive data dashboards. Its simplicity lies in its ability to transform data scripts into shareable web apps with minimal effort, making it an ideal choice for projects requiring quick and efficient deployment. Streamlit's intuitive syntax allows developers to focus on data analysis and visualization, eliminating the need for extensive web development expertise. With built-in widgets and easy integration with popular data science libraries, Streamlit empowers users to effortlessly create interactive visualizations and deploy data-driven applications, streamlining the process of turning data insights into accessible and engaging web-based tools.

3.4 Visual Studios Code:

Fig3.4: Visual Studio Code Logo

Visual Studio Code (VS Code) is a lightweight, open-source code editor developed by Microsoft. It offers robust features for coding, debugging, and version control, making it popular among developers. With its integrated terminal and built-in Git support, developers can work seamlessly without leaving the editor. VS Code supports multiple programming languages and offers a rich marketplace of extensions to enhance functionality. Its customizable user interface allows users to adapt the editor to their preferences. The editor provides IntelliSense, which offers smart code completion and suggestions based on context. It has a powerful search and replace functionality across files. VS Code is cross-platform, running on Windows, macOS, and Linux. It has a vibrant community that contributes to its ecosystem, creating extensions and sharing knowledge. The editor is free to use and continues to evolve with regular updates from Microsoft.

CHAPTER – 4 PROJECT WORK PART-II

4.1 Sig in Page:

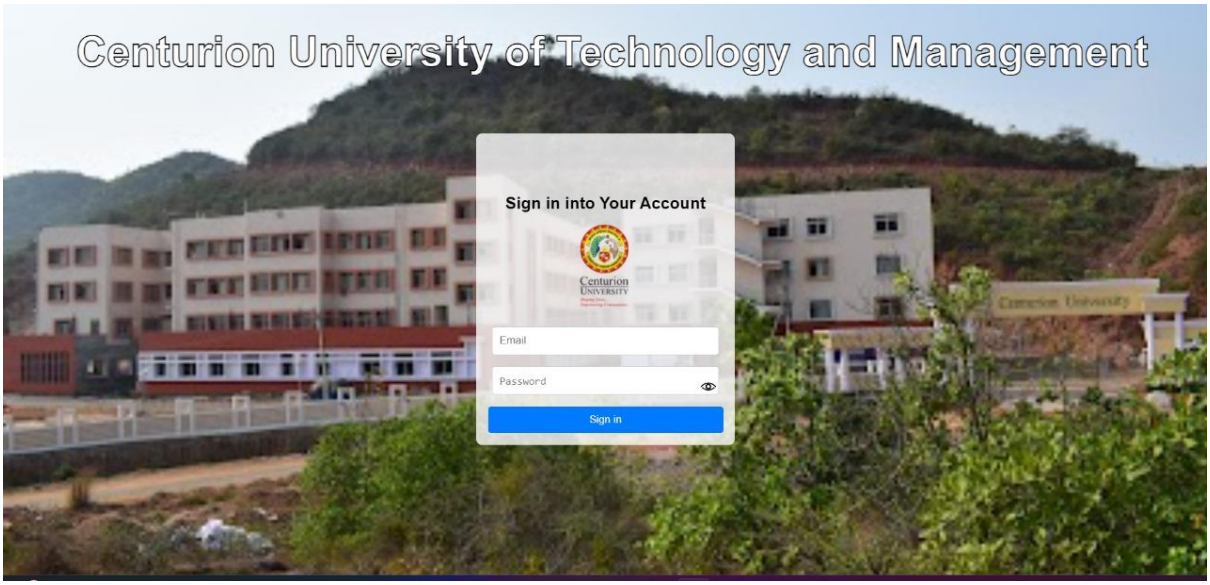


Fig4.1: Sigin Page

In the "Fees Dashboard" project, we designed a sign-in page specifically for admin access. On this page, admins can enter their user email and password into the designated fields. Once the credentials are filled in, there's a "Sign In" button to initiate the login process. This login mechanism ensures secure access to the admin section of the dashboard. The page is designed with a user-friendly interface to make the login process straightforward for admins. It incorporates validation checks to ensure the accuracy of the entered credentials. If the email or password is incorrect, appropriate error messages will be displayed to alert the user. The design is clean and intuitive, focusing on functionality and security. It's a pivotal part of the dashboard, ensuring that only authorized users can access the sensitive information and functionalities of the system.

4.2 Home Page:

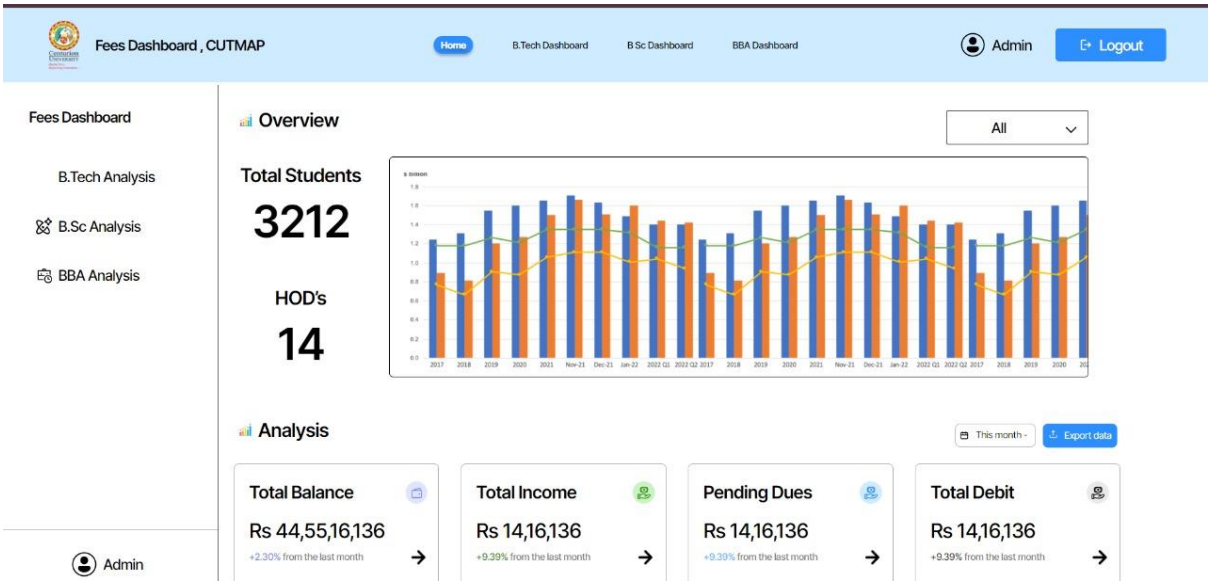


Fig4.2: HomePage

After logging into the "Fees Dashboard", the admin is directed to the Home page. This Home page prominently features four buttons at the top: "HOME", "B.Tech Dashboard", "B.Sc. Dashboard", and "BBA Dashboard". Additionally, in the top right corner, there's an "Admin Logout" option for the admin to securely log out.

The Home page provides key insights into the college's student body and administrative structure. It displays the total number of students currently pursuing their degrees and the total count of Heads of Departments (HODs) across departments.

Below these statistics, there's a graphical representation showcasing analytics related to student fees. This graph offers insights into the overall financial status of the student body, visualizing the trends and patterns of fee payments over time.

Further down on the Home page, there's an "Analysis" section. This section breaks down the financial data into specific categories. It displays the "Total Balances" of the fee structure, the "Total Income" generated from fees, "Pending Dues", and the "Total Debit" amounts. Each of

these categories is interactive; clicking on them redirects the admin to dedicated pages that provide more detailed information and data related to the selected category.

4.3 Department Overall Analytics:

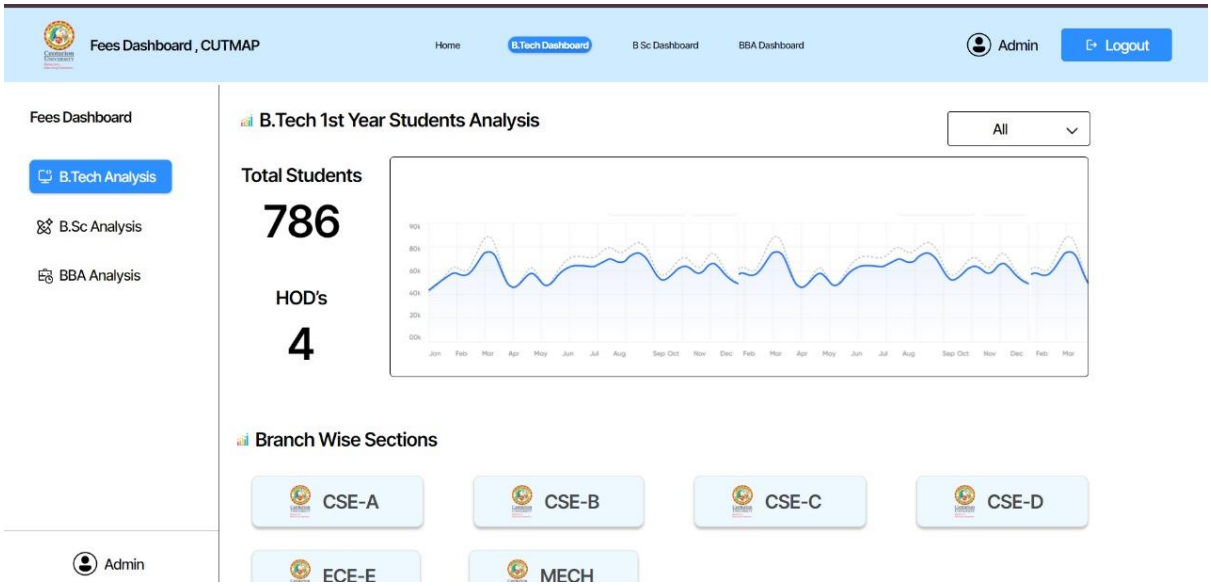


Fig4.3: Analytics

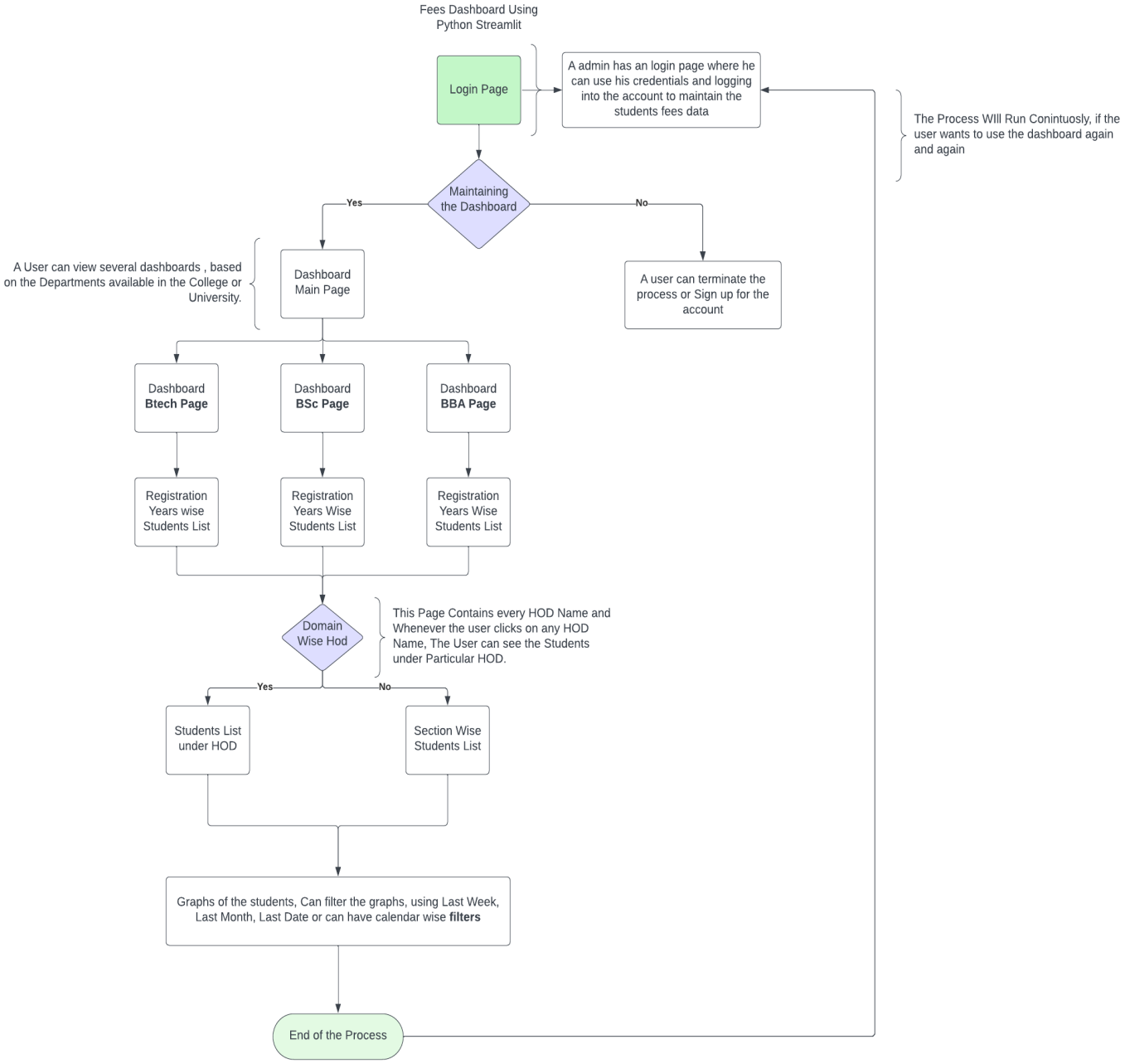
Upon navigating to the "B.Tech Dashboard" by clicking on the respective button at the top of the Home page, the admin can view detailed insights tailored to the B.Tech program. The dashboard provides information on the total number of students enrolled in B.Tech across various departments and the number of HODs leading those departments.

Additionally, the dashboard offers interactive visualizations. When the admin selects a specific year from the dropdown menu, the dashboard dynamically updates to display branch-wise data. For instance, branches like CSE-A, CSE-B, CSE-C, CSE-D, CSE-E, and Mechanical are listed with their respective sections.

Each branch and section listed on the dashboard is clickable. Clicking on any of these items redirects the admin to a dedicated page or section, providing deeper insights and data specific to that particular branch or section within the B.Tech department. This allows the admin to drill down into the details and access specific information related to student enrollment, HODs, fees,

and other relevant data for each branch and section.

4.4 **FlowChart:**



CHAPTER – 5 SUMMARY, CONCLUSIONS & SCOPE FOR FURTHER STUDY

5.1 Summary:

The Dynamic Fee Dashboard project aims to modernize Centurion University's fee management system, addressing its current limitations and challenges. The project focuses on automating manual processes, enhancing security measures, and improving user experience for both administrators and students. Using Python as the primary backend language the system will be built to ensure robustness and scalability. On the frontend, dynamic and interactive interfaces will be developed, complemented by UI frameworks for a consistent design. Security will be prioritized through data protection and secure authentication mechanisms. Testing phases will encompass unit, integration, and UI testing to ensure the system's reliability and performance. Deployment will leverage cloud platforms for scalability, while pipelines will automate the build and deployment processes. Monitoring tools will be implemented for continuous performance tracking. The project's structured methodology will guide its development, from requirements analysis to maintenance and support, ensuring a seamless transition to a modern fee management solution.

5.2 Conclusion:

The "Dynamic Fee Dashboard" project has effectively tackled the complexities of fee management by centralizing and automating processes. Through real-time fee updates and customized dashboards, the project has significantly improved transparency and operational efficiency. Utilizing technologies like Streamlit for visualization ensures that the system is scalable and adaptable to future needs.

This initiative showcases a blend of innovation, a focus on user-centric design, and a commitment to continuous improvement. As we look ahead, the project will continue to evolve with ongoing enhancements aimed at further streamlining fee management processes. This ongoing development will reinforce the project's positive impact and value to Centurion

University.

We extend our heartfelt gratitude to all stakeholders and team members who have played a pivotal role in the project's success. Their contributions have been invaluable, driving the project towards achieving its goals and making a difference in fee management at Centurion University.

5.3 Future Scope:

The Dynamic Fee Dashboard is envisioned as an evolving platform with potential for expansion and enhancement in the future. Some of the avenues for future development and scope include:

1. Advanced Analytics.
2. Mobile Application.
3. Integration with ERP Systems.
5. Enhanced Security Features.
6. Feedback Mechanism.
7. Expand Reporting Capabilities.
8. Payment Gateway Integration.
9. API Development.

5.4 Appendix:

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