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Student Nomination System For FSKTM

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Prototype Methodology, Web-Based System, Nomination

Abstract

The Student Nomination System is a technology-driven system designed to simplify and improve the process of nominating students for various awards or recognitions within a learning environment. This system was developed to overcomes the constraints of traditional nomination processes by providing a more structured and efficient procedure. The primary purpose is to improve the speed, accuracy, and efficacy of student nominations. The methodology that uses for this project is prototype model. By using this method, it will increase the possibility that the result will meet the user expectation in terms of performance, appearance and usability. The significance of this project is to enhance the educational experience of student by making academic materials easily accessible, improving performance monitoring, and facilitating more effective management.

1. Introduction

The Student Nomination System for FSKTM enhance efficiency, accessibility, and effectiveness in student nomination processes. It tracks and qualifies student for graduation awards, foster collaboration between student and faculty, support an inclusive student development approach, and provides analytical tools for continuous performance evaluation. The system acknowledges the importance of an outstanding student development process, emphasizing academic and co-curriculum aspects. It empowers student to manage the co-curriculum activities, automates scoring for award qualification, and promotes transparency, motivating active students, evaluating academic and co-curriculum balance, and providing valuable guidance for comprehensive student success.

The existing system faces challenge with limited faculty access and delayed student tracking after graduation, hindering active engagement and mentorship opportunities. Management and data issue arise with a growing student population, complicating account management and leading to potential inefficiencies. Additionally, student lack full access to the system, impacting their personal development by missing opportunities for growth, analysts of co-curriculum activities, and monitoring cumulative points. The proposed system aims to address these issues, serving as a comprehensive system for real-time feedback and insight into student progress.

The objective of Student Nomination System for FSKTM is to develop a comprehensive system for student nomination management, develop Student Nomination System using web-based approach and to test the developed system to meet the needs of users. Student Nomination System for FSKTM aims to develop an effective student nomination management for the Faculty of Computer Science and Information Technology. It seeks to transform the handling of student information, academic result, and co-curriculum records to enhance student experience, simplify administrative processes, ensure data protection, and comply with rules. The system prioritizes simplicity for both student and faculty while maintaining secure and compliant data practices. The scope includes user management with distinct roles, award management for administrator, nomination

submission, review and evaluate features, and reporting. The system's focus is on leveraging technology to improve processes and decision-making for FSKTM faculty and students.

2. Literature Review

A literature review necessitates the analysis and evaluation of multiple source types, including academic and professional journal articles, books, and web-based materials. A literature search is necessary for identifying and discovering relevant publications and other sources[1]. At this point, it explains the existing understanding of a system in the context of research and highlights relevant subtopics.

2.1 Study of Existing Related System

The analysis of the current system entails a thorough evaluation and analysis of a system's or process's current status in order to discover its strengths, weaknesses inefficiencies, and areas for development. The objective of this study is to get a complete knowledge of how the system works so that prospective improvements or the development of a new system may be informed.

The Tokoh Siswa Award System is highly regarded for recognizing students' outstanding achievements in organizational leadership and the development of high-impact programs on both the national and international levels. As a crucial platform, this award recognizes and inspires student leaders who have demonstrated not just brilliance but also a comprehensive and capable approach to leadership, perfectly in line with the goals set forth in Leap 1 of the Education Development Plan for Higher Education[2]. The main purpose of the Tokoh Siswa Award system is to recognize outstanding student accomplishments in the areas of organizational leadership and high-impact program development on a national and worldwide level.

A Student Information System (SMAP) is a complete software application designed to handle and organize a wide range of student information inside an educational institution. As a centralized repository, the SMAP collects and maintains full profiles for each student, including personal information, contact information, academic background, and enrollment status. This technology is critical in simplifying administrative operations and enabling duties like as enrollment, registration, and course schedule development. SMAP allow students to use it to register for classes, view class schedules, and track their academic progress.

Student Award System at UTM was created based on the assessment procedure and the selection of students to receive academic awards at the convocation event. According to the established criteria, this recommendation mechanism can help committee members find and choose qualified applicants for the award. This is because the recommendation system can give a way of comparison and control over the environment, methods, and approaches in the evaluation of applicants for the awarding of academic prizes the mentioned. The main purpose of UTM's Student Award System is to serve as an effective tool for recommendations and selection. In accordance with established requirements, it simplifies the process of assessing and selecting candidates for academic honors during convocation ceremonies.

2.2 Comparison with the Existing Systems.

As for the existing systems, which Tokoh Siswa Award System, Student Information System (SMAP), and Student Award System (UTM), provide a comprehensive set of features designed to manage student information, recognize outstanding achievements, and streamline administrative and academic processes within educational institutions. Table 1 shows the comparison between Student Nomination System for FSLKTM and others existing system.

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Table 1: Existing System Comparison

Features/System	Tokoh Siswa Award System	Student Information System (SMAP)	Student Award System of UTM	Student Nomination System of FSKTM
Login Module	√	√	√	√
User Information Module	√	√	√	√
Co-curriculum Module	√	√	√	√
Academic Module	√	√	√	√
Nomination Module	√	x	√	√
Scoring & Evaluating Module	x	x	x	√
Reporting Module	x	x	√	√

3. Methodology

This chapter will explain about the methodology that are used to developed Student Nominations System. The methodology that used for this project is Prototyping Model. The Prototype Model places more emphasis on developing the program itself than on creating a lot of documentation. This method allows the functional software to release early. By giving user, the opportunity to see and interact with a prototype, prototyping encourages increased user participation and gives them the ability to offer more thorough and insightful feedback and requirements. Users may avoid a lot of miscommunications that frequently occur when both sides presume mutual comprehension by having a prototype available for evaluation. Prototypes enable product teams to clarify calculations and highlight errors in requirements, swiftly assess alternative techniques, and offer intermediate, functional versions for feedback to end users and other interested parties[3]. The prototype approach can stimulate the effective development of applications by separating a complicated, occasionally ill-defined, problem into numerous comprehensive yet smaller and simpler parts[4]. Because of the model's adaptability and willingness to evolve, it is also perfect for encouraging creativity and innovation by enabling the investigation of different design concepts and features. Figure 1 show the Prototype Model of the system.

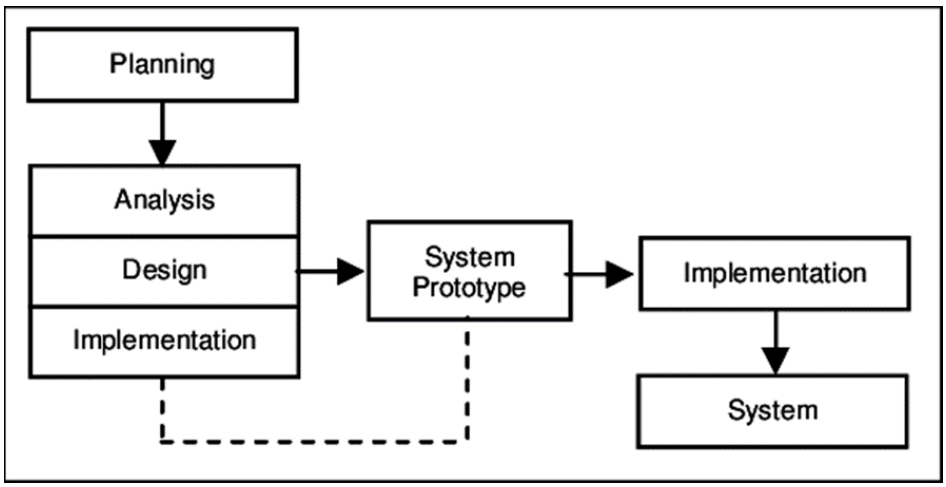

Fig. 1: Prototype Model

3.1 Prototype Model Phase

Table 2 shows a list of tasks carried out for each phase in Prototype model for the development of Student Nomination System for FSKTM.

Table 2: Task list for each phase in Prototype Model

Phase	Task
Planning	• Proposed the project • Determine the project schedule, activities and output
Analysis	• Gather and analyse user requirements • Interview the stakeholder • Studying existing system • Identify project risk
Design	• Design the interface of the system • Create system architecture and design
Implementation	• Write a code of the system • Test the functionality of the system
System Prototype	• Develop a working prototype • Gather user feedback and make improvement
Implementation	• Code the final system based on prototype • Conduct system testing
System	• Deploy the system to the production environment

4. Analysis and Design

Analysis and Design is an important phase that establishes the framework for the whole project. It is a techniques and approaches to design systems more effectively and efficiently[5]. The major goal is to properly understand and explain the system requirements by analyse functional and non-functional requirement of the project.

4.1 Functional & Non-functional Requirement

Various approaches, including stakeholder interview and document analysis are used throughout this phase to discover and gather both functional and non-functional requirements. Table 3 and Table 4 show the functional and non-functional requirement of the system.

Table 3: Functional Requirements

Module	Description
Login Module	• Allow the existing users to login with the email and password. • Redirect the valid users to dashboard when successful login.
User Information Module	• Allow user to interact with their valid dashboard. • Allow admin to create, update, view, and manage user profiles.
Co-curricular Module	• Allow student to record their activities involvement throughout their studies. • Allow student to record their participation in co-curriculum activities. • Allow student to record their skills, and achievement through participation in co-curriculum activities. • Allow academic advisor, appraiser, and administrator to get information of student activities involvement. • Allow faculty advisor, appraiser and administrator to check student eligibility for the award.
Academic Module	• Allow student to record their CPA and GPA result for every semester. • Allow system to display award for student based on their CPA result. • Allow faculty advisor, appraiser and administrator to check student eligibility for the award in academic performance. • Implement a workflow for the review of nominations for awards.
Scoring & Evaluating Module	• Allow system to calculate the mark for each category of student activities involvement. • Allow appraiser to evaluate and monitoring student score for the award.
Nomination Module	• Allow administrator to define and set up different award categories within the system. • Allow appraiser to choose award for deserving student.
Reporting Module	• Allow for real-time tracking of the nomination workflows.

Table 4: Non-functional Requirements

Requirement	Description
Security	The system only allow user to access to their own account only based on their username and password.
Performance	The system should be always usable and quick responding.
Usability	The system should be user friendly and easy to use.
Operational	The system should be able to work on any web browser
Reliability	The system should run smoothly.

4.2 Context Diagram

Context diagrams present the overview of interaction between the system and its user. Context diagram also show the input and output to and from its user and system. Figure 2 show the context diagram of the system.

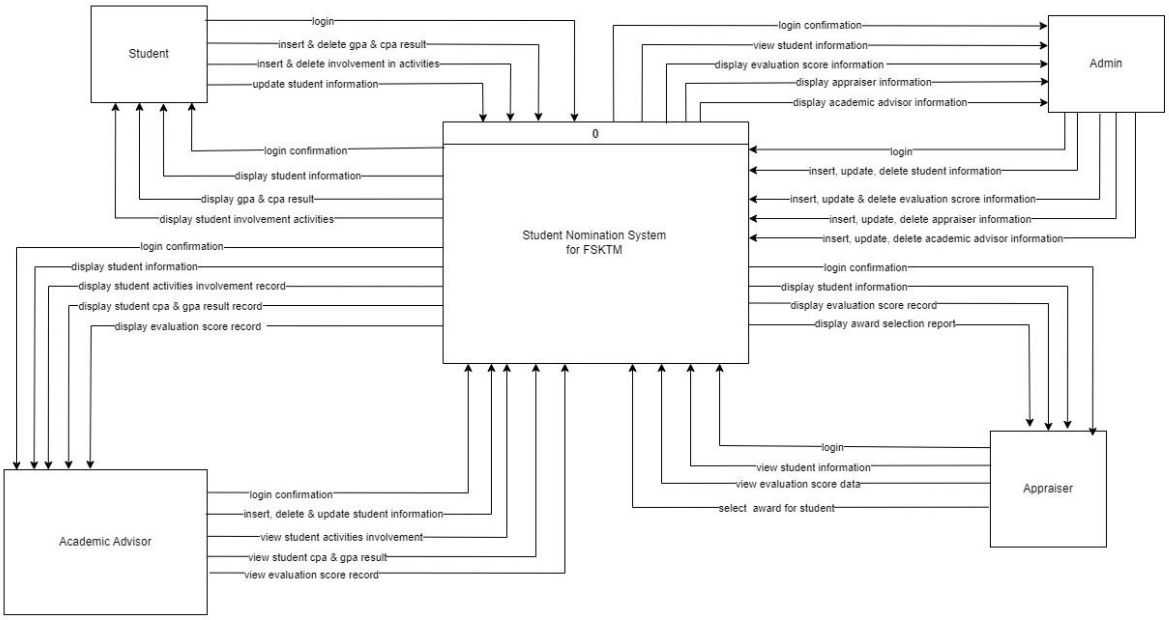

Fig. 2: Context Diagram of Student Nomination System

4.3 Data Flow Diagram

Data Flow Diagram (DFD) is a graphical diagram used to describe, build, and visualize a system's model[6], which then generates output either to another entity or stored in data storage. DFD shows each input and output for each entity and process. Figure 3 show the Level 0 Data Flow Diagram (DFD 0) of the developed system.

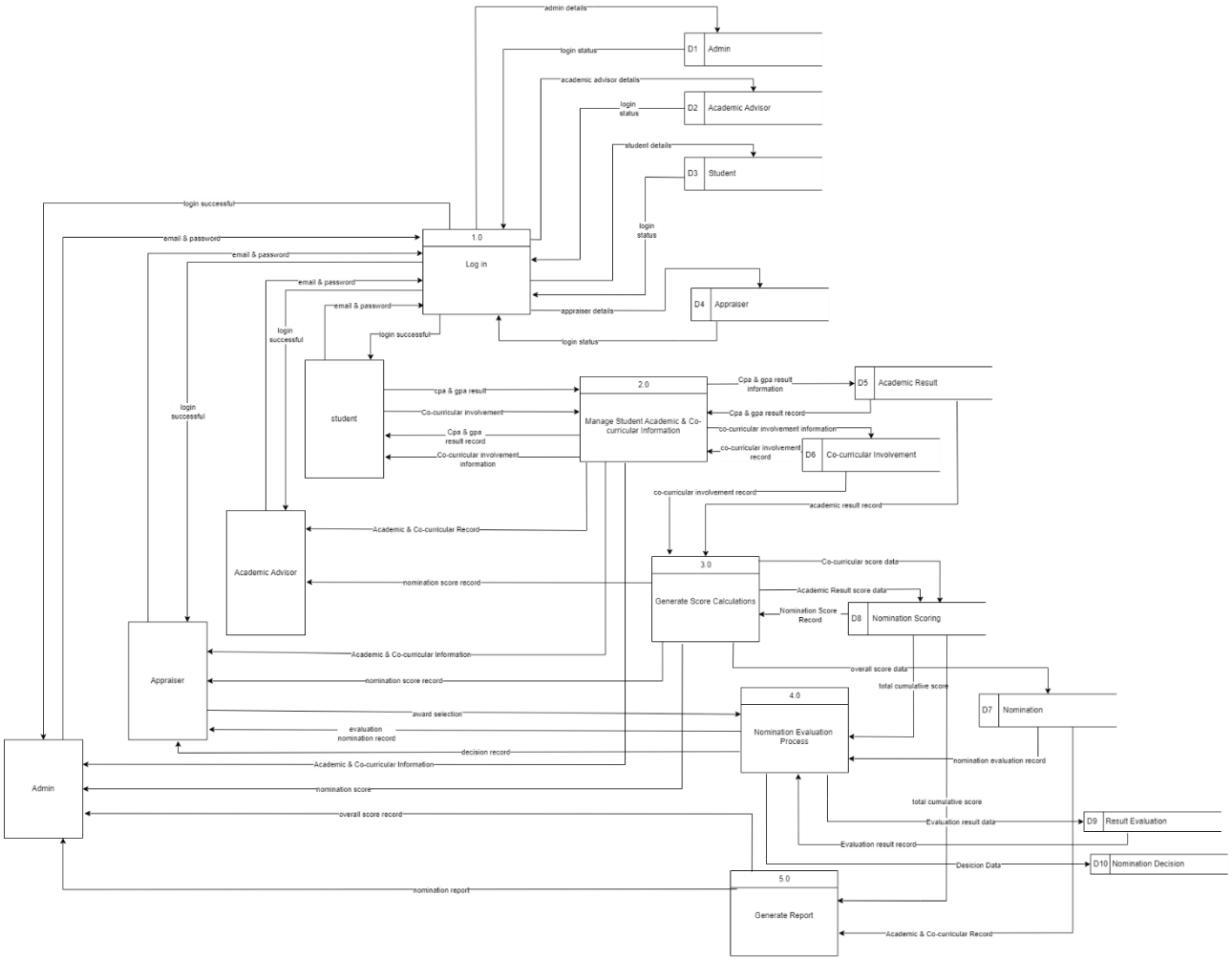

Figure 3: Data Flow Diagram Level 0

4.4 Entity Relationship Diagram

Entity-Relationship Diagram (ERD) is a common approach for designing data structures and database systems[7]. It used in database design to illustrate the structure of a database and how different entities interact. ERD use a set of system to represent the entities, attributes and relationships. Figure 4 show the ERD of the Student Nomination System.

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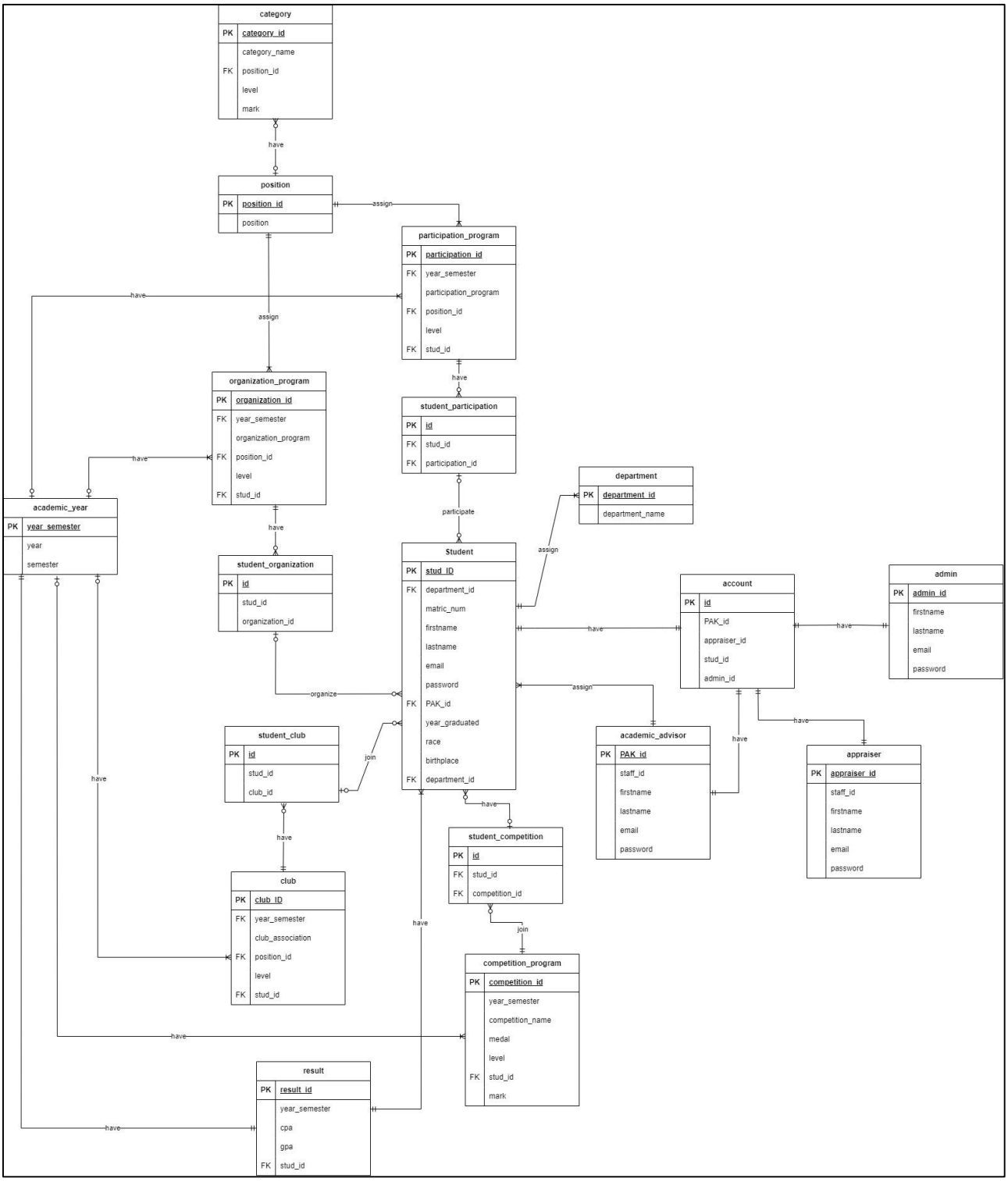

Figure 4: ERD of the Student Nomination System

4.5 Flowchart

Flowchart is a visual representation of a process, system or algorithm that use standardized symbols to describe various processes, choices, and information flow. Flowchart are frequently used to illustrate the sequential phases of a process, making it easier to comprehend and evaluate. Figure 5, 6, 7 and 8 show the flowchart of each user of the system.

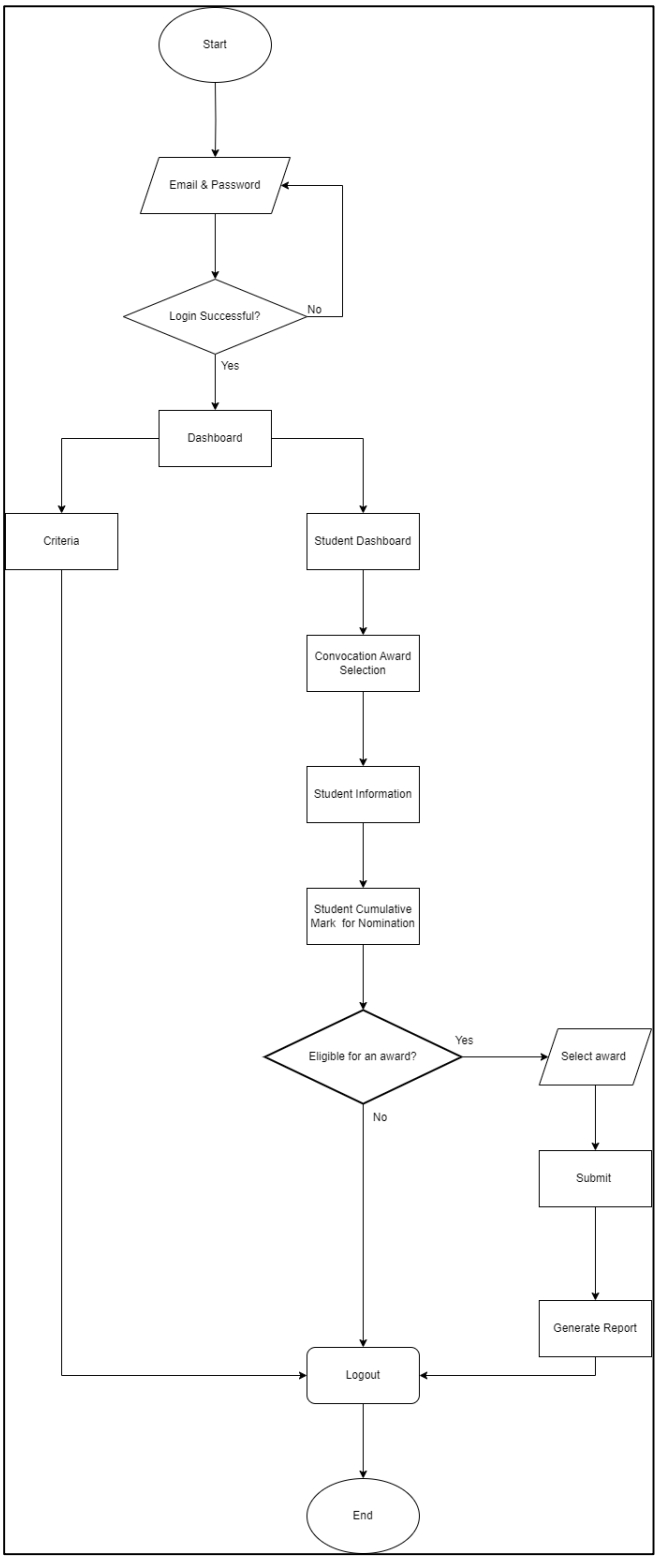

Fig. 5: Flowchart of Student Nomination (Appraiser)

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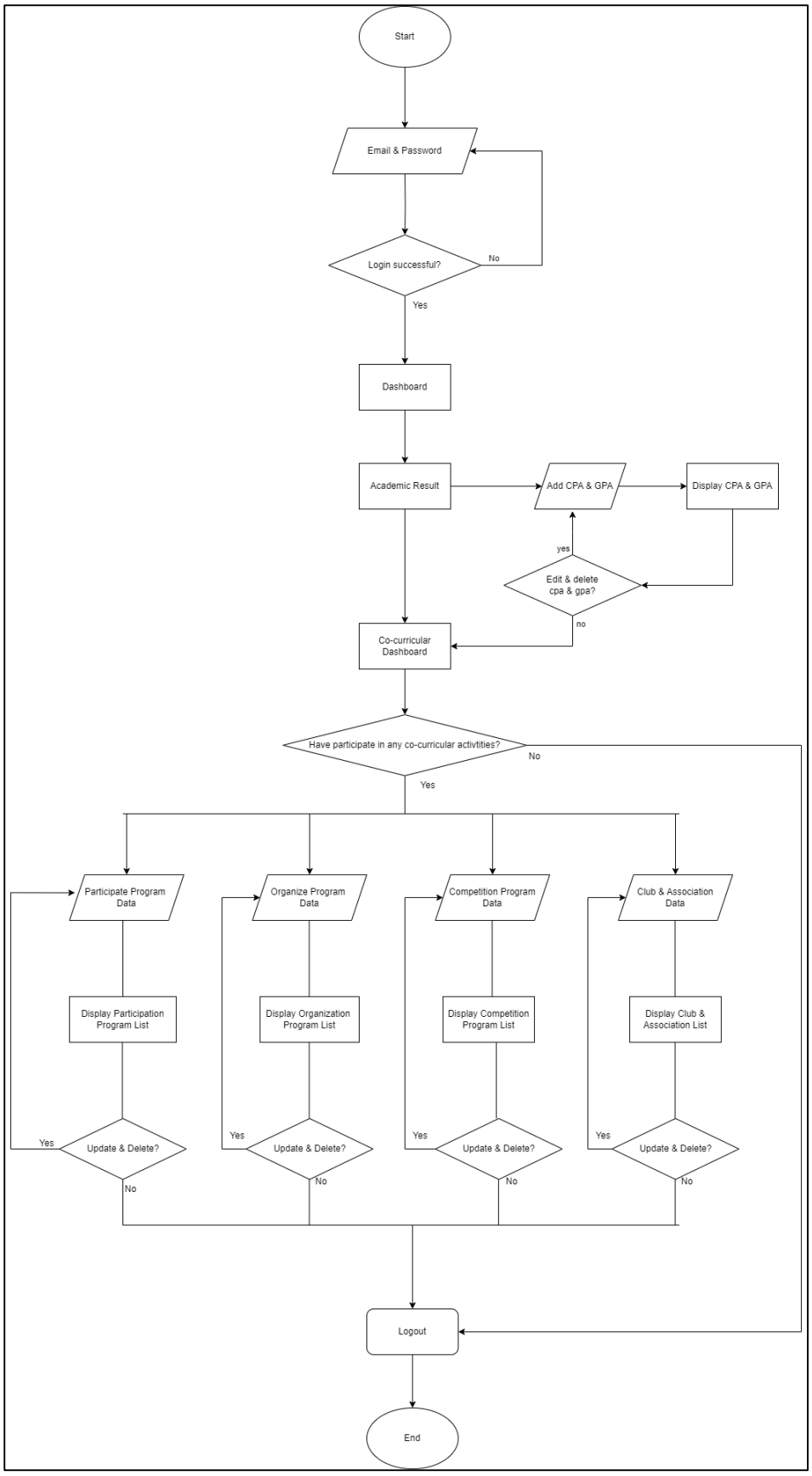

Fig. 6: Flowchart of Student Nomination (Student)

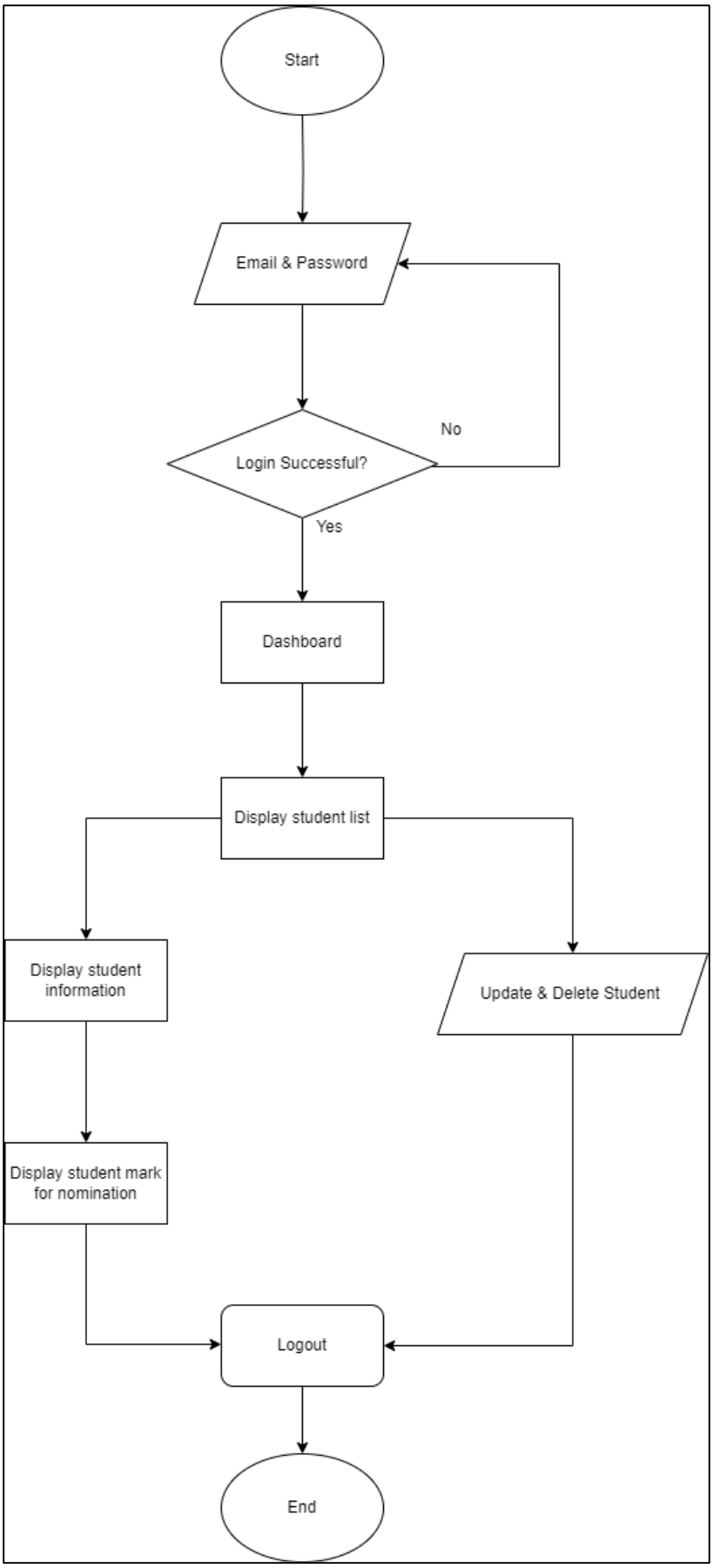

Fig. 7: Flowchart of Student Nomination (Academic Advisor)

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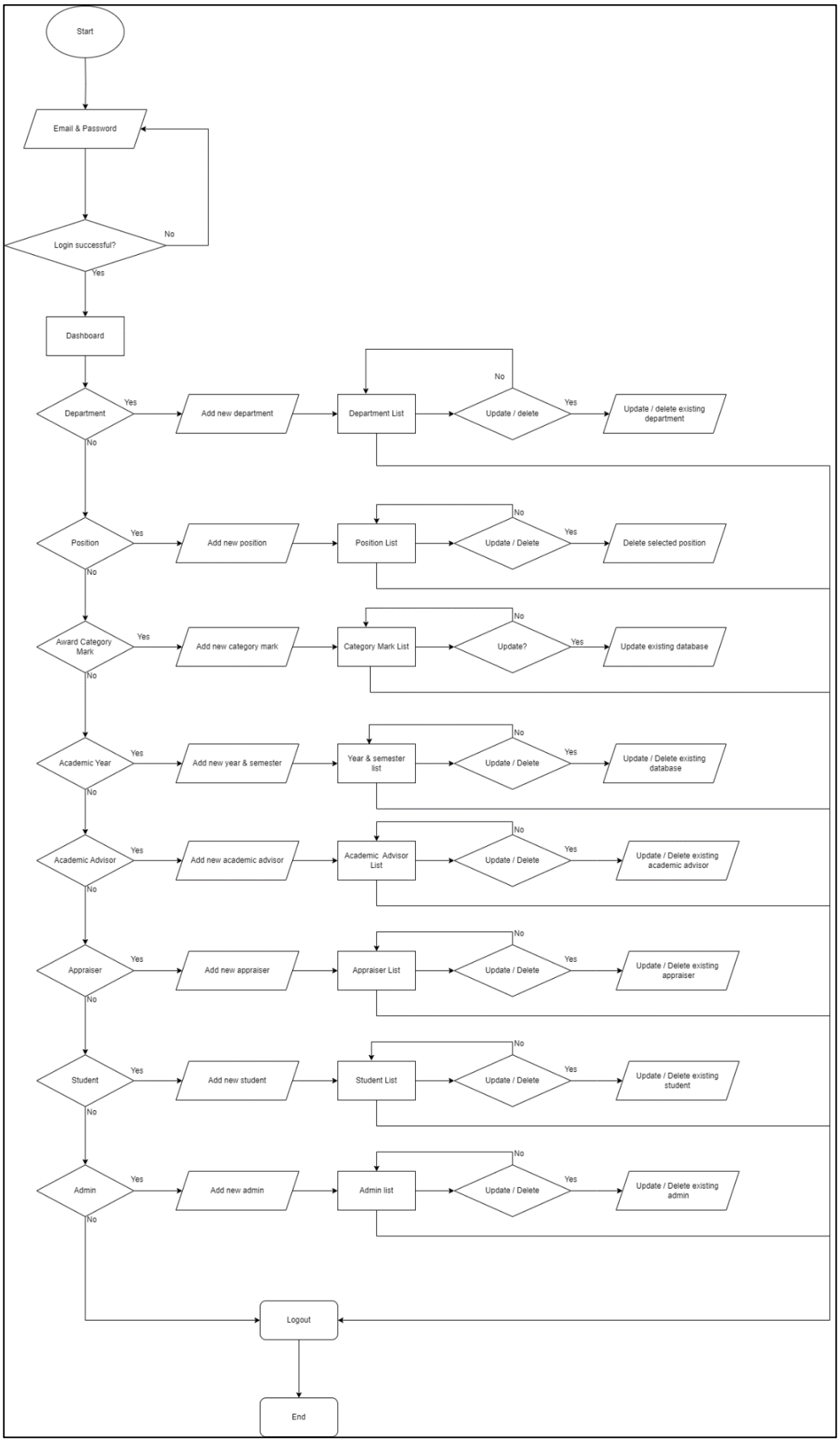

Fig. 8: Flowchart of Student Nomination (Academic Advisor)

5. Result and Discussion

The process of implementing a system in the development stage involves building the system based on requirements and making sure it meets quality standards. This step includes writing the systems programs, which entails coding and setting up the database. The main objective of testing the system is to ensure it runs smoothly without any issues and that all features meet the needs and expectations of users. Initially testing is done with a group of users before rolling out to all users. This section covers three testing phases; unit testing, system integration testing and user acceptance testing.

5.1 System Implementation

Student Nomination System required four users to access to this system which is student, admin, academic advisor and appraiser. Students utilize the system to submit their GPA and CPA scores, as well as track their participation in activities. Administrators monitor the whole system, including user accounts and system settings, to ensure uninterrupted functioning and data accuracy. Academic advisers monitor and assist their students, using their academic and activity information to give personalized counsel. Appraisers analyse student nominations based on the data provided, assuring fair and consistent grading. In the implementation phase, it involves the coding which is HTML, CSS and PHP to build and executing the system.

5.1.1 Student

Figure 9 show the Academic Result page. In this page, there is a "Result List" table displaying academic result for different semesters. The table includes column for Year & Semester, GPA, CPA and Action. The Action column have function for editing and deleting the data. At the right side, there is "Add New" button which allow student to add new result, and search bar that helps filters the result. This page helps student to manage their academic record easily.

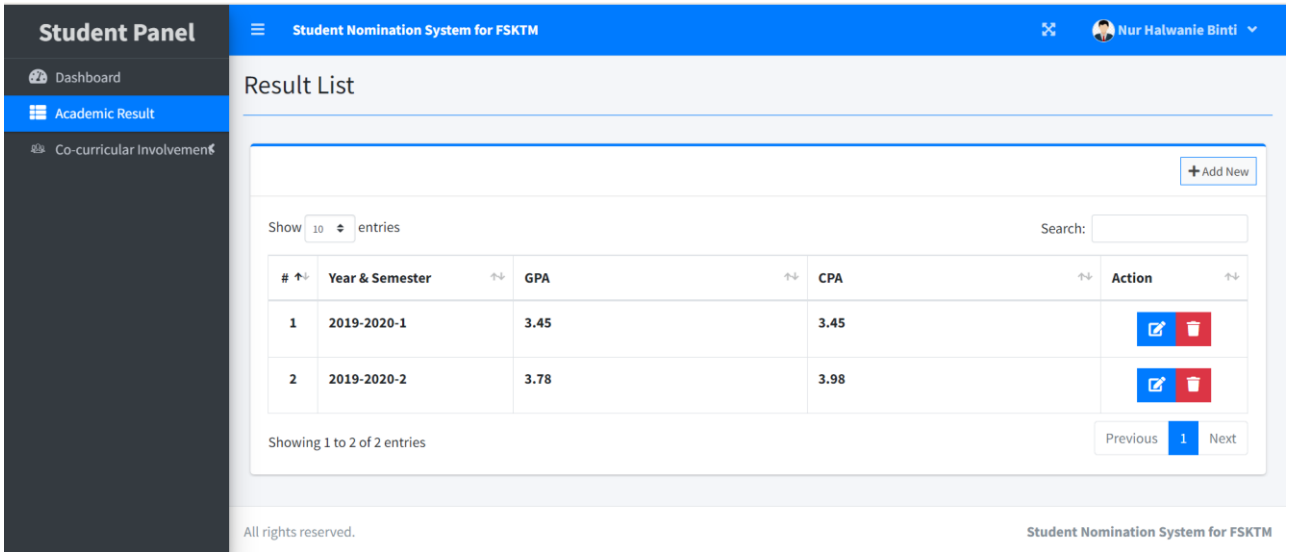

Fig. 9: Academic Result Page

Figure 10 shows the "Co-curricular Involvement" page. The left sidebar highlights the "Co-curricular Involvement" tab, indicating it is currently active, with further sub-options like "Competition Program Involvement", "Organization Program Involvement," "Participation Program Involvement," and "Club & Association Involvement." In the figure 11, it displays the "Competition List" page which it shows the details of student's participation in competitions. The table includes column for Year & Semester, Program, Medal, Level and Action. At the right side of this page also have "Add New" button for adding new competition program and a search bar for filtering the list.

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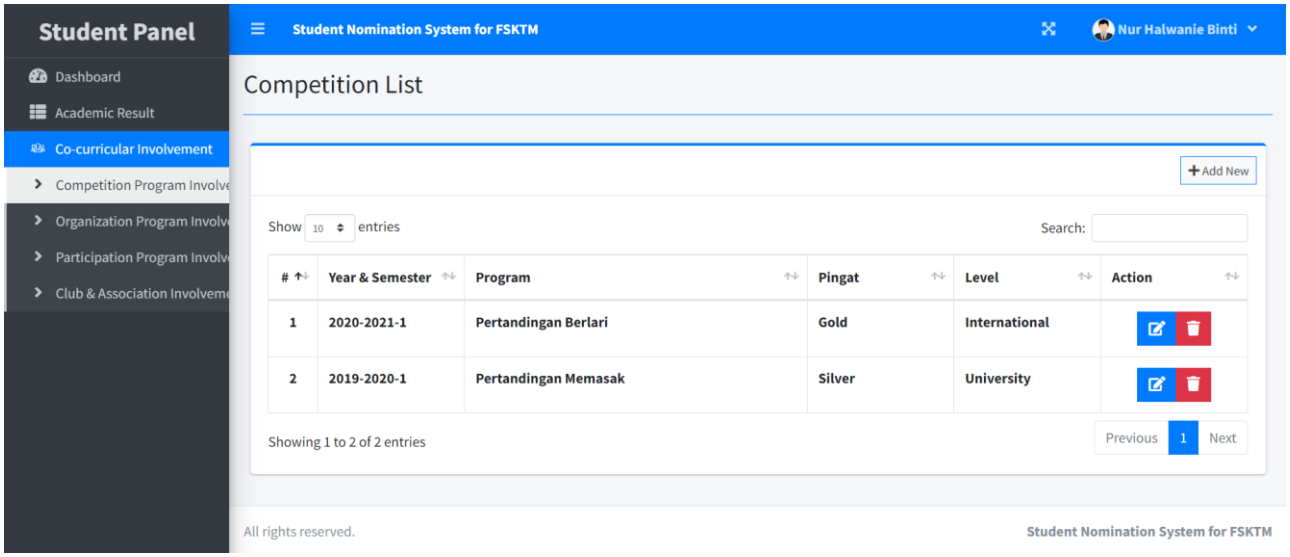

Fig. 10: Competition Program Involvement

5.1.2 Admin

Figure 11 show the Award Category Mark page which is display the data of mark for every involvement of the student. This page allow admin to assign mark based on category, position and level. Each of it have different mark.

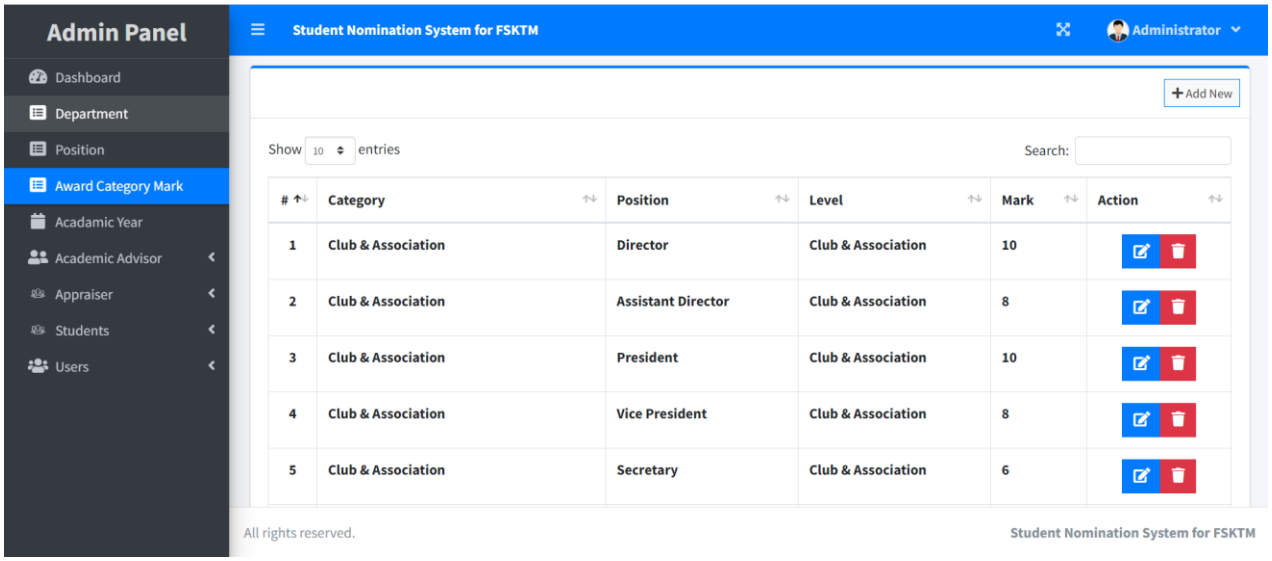

Fig. 11: Award Category Mark Page

Figure 12 show the Student List page. In this page, it displays the list of students that have been add to the system along with their information such as matric number, name, race, birthplace, email and department. In Action column, admin is able to display student information, update student data and delete student.

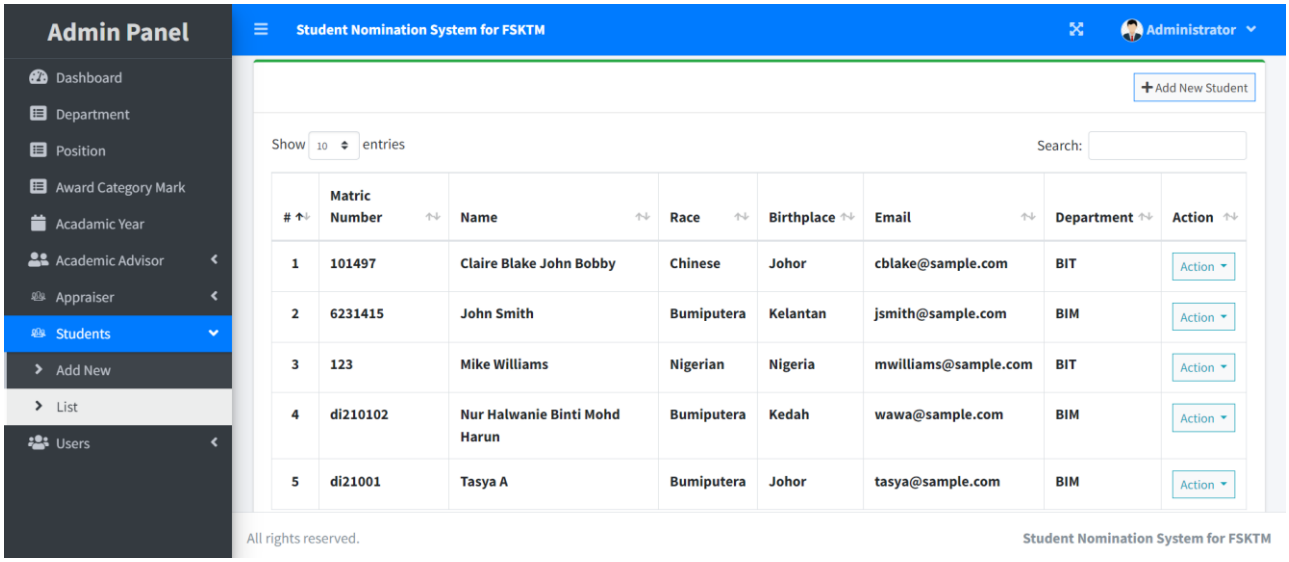

Fig. 12: Student List Page

5.1.3 Appraiser

Figure 13 show the Convocation Award Selection page where it displays the student information and award list. In this page, user can select an award that is eligible for students. After the click on the award, user can click submit button at the right side of the page to nominate student for graduation. There also have View Information button on the right side which it allows user to view the student information data before nominate students.

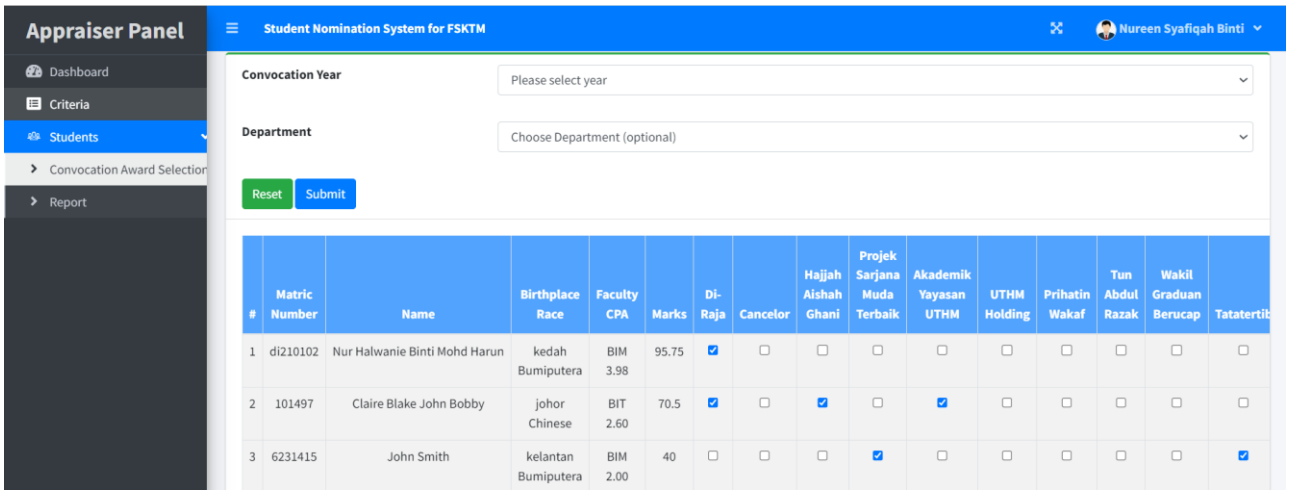

Fig. 13: Convocation Award Selection Page

Figure 14 show the Report page. After user click submit for the award selection, the data will show in this page. This page allow user to print the report of the nomination. Only student who got the award will be displayed in this page. On top of the page, there are function where user can select convocation year to display the report based on student convocation year.

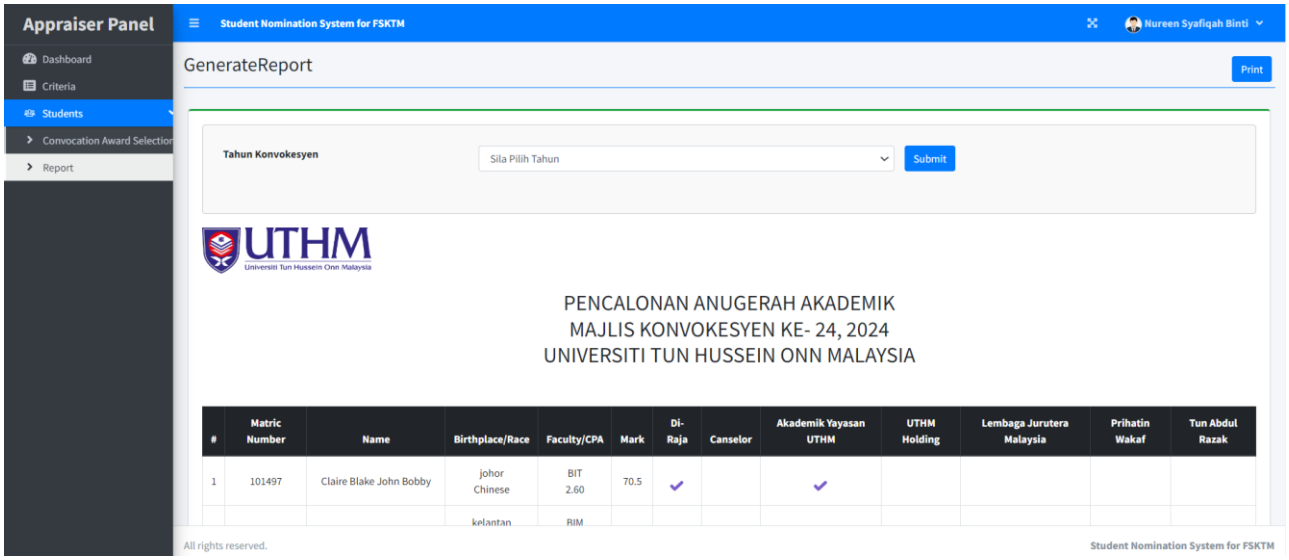

Fig. 14: Report Page

5.1.4 Academic Advisor Interface

Figure 15 shows the Academic Advisor interface dashboard for the "Student Nomination System for FSKTM". On the right side of this bar, there are logged-in user's name as well as a user icon or avatar. User can click on the name and edit profile function will pops-up which allow student to edit their information. The left side of the screen has a vertical navigation menu labeled "Student Panel" that includes two options: Dashboard and Students. The Dashboard option is highlighted in blue to indicate that it is the currently active area. The primary content section greets students by name and offers a simple, structured interface for exploring and maintaining their academic and extracurricular data. This style allows students to simply access and manage their information within the system.

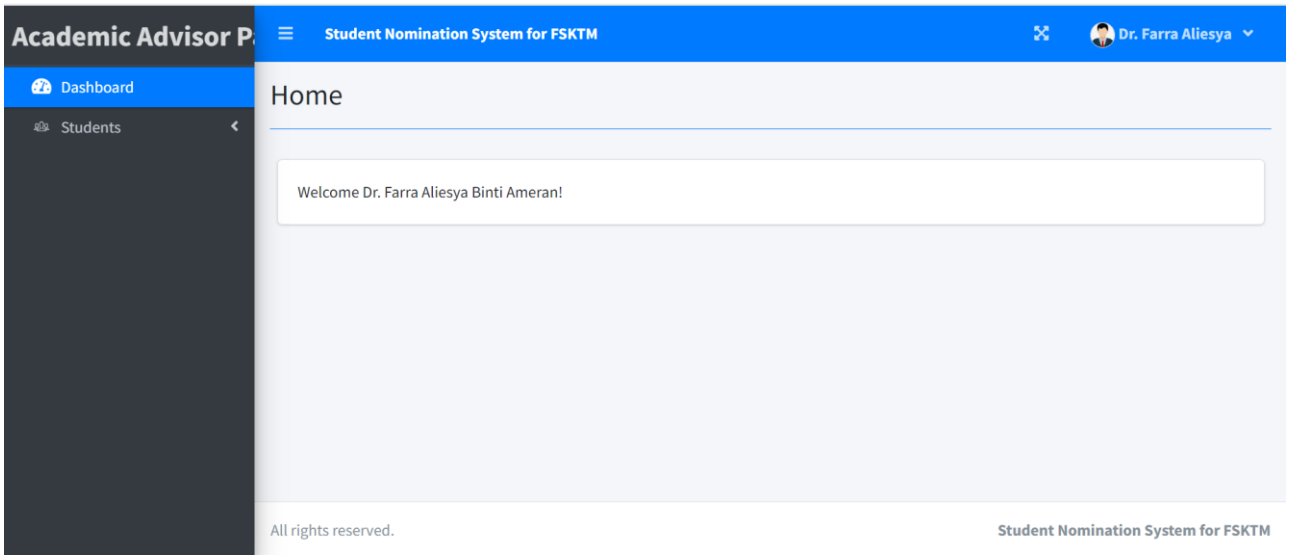

Fig. 15: Academic Advisor Dashboard

Figure 16 show the Student List page. In this page, it displays the list of students that have been add to the system along with their information such as matric number, name, race, birthplace, email and department. In Action column, admin is able to display student information, update student data and delete student.

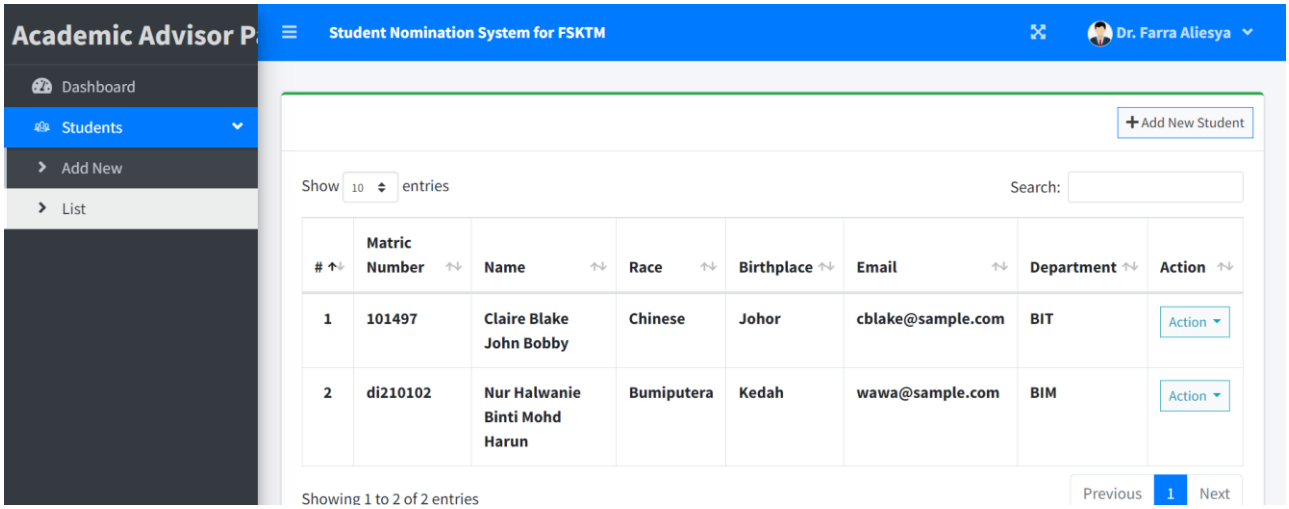

Fig.16: Student List page

5.2 Functional Testing

Table 5: Test Plan for User Login

No	Test Cases	Expected Outcome	Result
1.	User login with valid email and password	Login successful and redirect user dashboard	As Expected
2.	User login with invalid email and password	Login unsuccessful and message of email or password is incorrect	As Expected

Table 6: Test Plan for Manage Student Information

No	Test Cases	Expected Outcome	Result
1.	Add new student information with valid details	Student information is successfully added	As Expected
2.	Add new student information with missing details	Error message indicating which details are missing	As Expected
3.	Add new student information with existing details	Error message indicating that student already exist	As Expected
4.	Edit existing student information with valid updates	Student information is successfully updated	As Expected
5.	View student information	Student information is displayed correctly	As Expected
6.	Delete student information	Student information is successfully deleted	As Expected

Table 7 Test Plan for Generate Score Calculations

No	Test Cases	Expected Outcome	Result
1.	Calculate score with valid GPA and activities data	Score calculations are performed accurately	As Expected
2.	Calculate score with missing GPA or activities data	Score calculations not performed accurately	As Expected
3.	Display calculated scores	Score are displayed correctly	As Expected
4.	Update score calculation formula	Scores are recalculated correctly with updated formula	As Expected

Table 8 Test Plan for Nomination Process

No	Test Cases	Expected Outcome	Result
1.	Select award for nomination	Award is successfully selected for nomination	As Expected
2.	View nomination result	Nomination result is displayed correctly	As Expected
3.	Updates nomination criteria	Nomination is updated correctly according to new criteria	As Expected
4.	Submit award selection	Award selection is successfully submitted	As Expected

Table 9 Test Plan for Generate Report

No	Test Cases	Expected Outcome	Result
1.	Generate report with complete data	Report is generated correctly	As Expected
2.	Generate report with incomplete data	Error message indicating missing data	As Expected
3.	View generated report	Report is displayed correctly	As Expected

5.3 User Acceptance Testing

User Acceptance Testing (UAT) is the last stage of the application software development lifecycle. It acts as an important phase for end users to ensure that the system fulfils their needs and expectations before it is launched for operational usage. UAT assures that the program not only performs as expected on a technical level, but also meets business objectives and user expectations. The goal of UAT is to ensure that the system is ready for real-world usage by the target audience. This includes comparing the system to user requirements, verifying that all capabilities operate properly, and validating that the system can handle real-world scenarios and workflows. Figure 17 and Figure 18 show the result of User Acceptance Testing from all user.

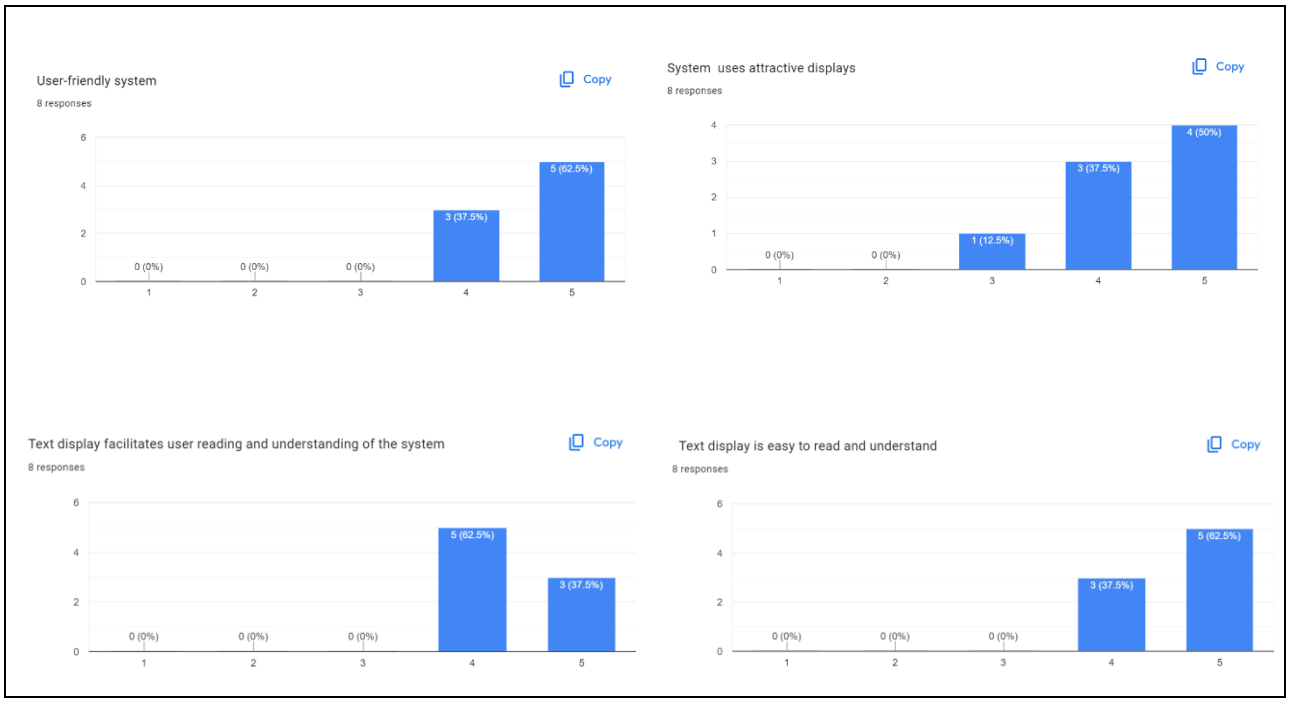

Fig. 17: User Acceptance Testing Result

Fig. 18: User Acceptance Testing Result

6. Conclusion

The project covers the development of a Student Nomination System for the Faculty of Computer Science and Information Technology (FSKTM). The system's goal is to simplify student nomination processes, addressing issues such as limited faculty access and delayed student monitoring. It presents a complete web-based solution with an emphasis on ease of use, user roles, and effective data administration. A literature review compares the proposed system to current ones, and the technique includes software development utilizing the Prototyping Model. During the analysis and design phases, functional and non-functional needs are outlined, and architectural overviews are provided using context diagrams, data flow diagrams, and entity-relationship diagrams. The system's overall goal is to improve student nomination within the educational system.

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