SOFTWARE REQUIREMENT SPECIFICATION FOR FIVE CO WISE PERIODICAL TEST MARKS AND CO,PO CALCULATION AND RESULT ANALYSIS

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SEAT NUMBER: 495
PROJECT ID: 14
PROJECT TITLE: ACADEMIC PERFORMANCE TRACKER(APT)

TECHNICAL COMPONENTS:

COMPONENT	TECH STACK
BACKEND	NODE JS , EXPRESS JS
FRONTEND	NODE JS
DATABASE	MONGODB
API	OPEN API

PROBLEM STATEMENT:

Faculty members often face challenges in efficiently tracking and analyzing students' academic performance due to the manual and fragmented nature of current processes. This results in difficulties in timely identification of students who are struggling, inconsistent calculation of Course Outcomes (CO) and Program Outcomes (PO), and a lack of streamlined data management. There is a need for a comprehensive platform that can simplify the entry, management, and analysis of student performance data from various assessments, ensuring accurate calculation of CO and PO, and providing actionable insights to improve student outcomes.

PROJECT - FLOW:

Purpose:

The purpose of this project is to create a platform that enables faculty to streamline the process of tracking students' academic performance through periodic tests and innovative practices. This platform will allow faculty to efficiently enter, manage, and analyze student data, calculate key performance metrics, and identify students who need additional support, thereby improving overall academic outcomes.

Scope:
The scope of this project includes developing a web-based platform for faculty members to input department, semester, and assessment information, creating a system to calculate CO and PO scores based on student marks, identifying students who are below the CO threshold for a particular subject, calculating CO and PO scores for the end semester, generating a PO attainment sheet, ensuring the platform is user-friendly and easy to navigate for faculty members, and providing a secure and reliable system for storing and managing student data. By achieving these objectives, the project will provide a valuable tool for faculty members to improve student performance and academic outcomes.

Business context:

Develop a web-based platform for Bannari Amman Institute of Technology to streamline faculty tracking of student academic performance, enabling efficient data management, performance analysis, and timely student support to enhance overall academic outcomes.

Consideration:

- All faculty can possess active Google accounts for authentication.
- Users have regular access to internet-enabled devices.
- A streamlined workflow that allows for efficient CO and PO calculation of students and track their academic performance.

Dependencies :

- **Data Ingestion and Integration**: To gather information on student performance, the platform will need to be integrated with a number of data sources, including assessment tools, student information systems (SIS).Dependency on data formats: To handle a variety of data sources, the platform must support multiple data formats, including CSV, Excel, and JSON.
- **Database Management System:** A database management system is needed to store students' academic performance, calculate key performance metrics like CO and PO, and provide actionable insights to improve student outcomes.
- **Analytics and Reporting Tools:** Integration with analytics and reporting tools is necessary to leverage the strengths of each tool and ensure smooth communication between the backend and frontend.

User Personas:

1)Students:

- They can track and analyze student performance data through periodical tests and innovative practice**s.**
- They can identify students who need additional support and provide targeted interventions.

2)Admin:
Faculty(activity masters):
- They can manage and maintain the platform, ensuring data accuracy and integrity.
- They can generate reports and analytics to inform institutional decision-making.

Functional requirements:

1) User Registration and Authentication:
Users (faculty members, and admin) should be able to login and authenticate themselves on the platform.

2) Data Ingestion and Integration:

- The platform will be able to collect and integrate student performance data from various sources,

including Learning Management Systems (LMS), Student Information Systems (SIS), and assessment tools.
● The platform will need to support various data formats such as CSV, Excel, and JSON to accommodate different data sources.

3) Data Analytics and Reporting:
● A user-friendly interface for tracking and analyzing student performance data, including metrics such as Course Outcomes (CO) and Programme Outcomes (PO), should be made available to faculty members by the platform.
● In order to enhance overall academic performance and assist with institutional decision-making, the platform needs to produce reports and analytics.

4) Students Performance Tracking:
Faculties should be able to use the platform to monitor students' progress over time and identify their areas of strength and weakness.

5) Security and Authentication:
The platform should ensure the security and integrity of student performance data, including authentication and authorization protocols to ensure only authorized users can access the data.

Non Functional Requirements:

1) Scalability:
The platform should be designed to handle large volumes of student performance data and scale to meet the needs of a growing user base.
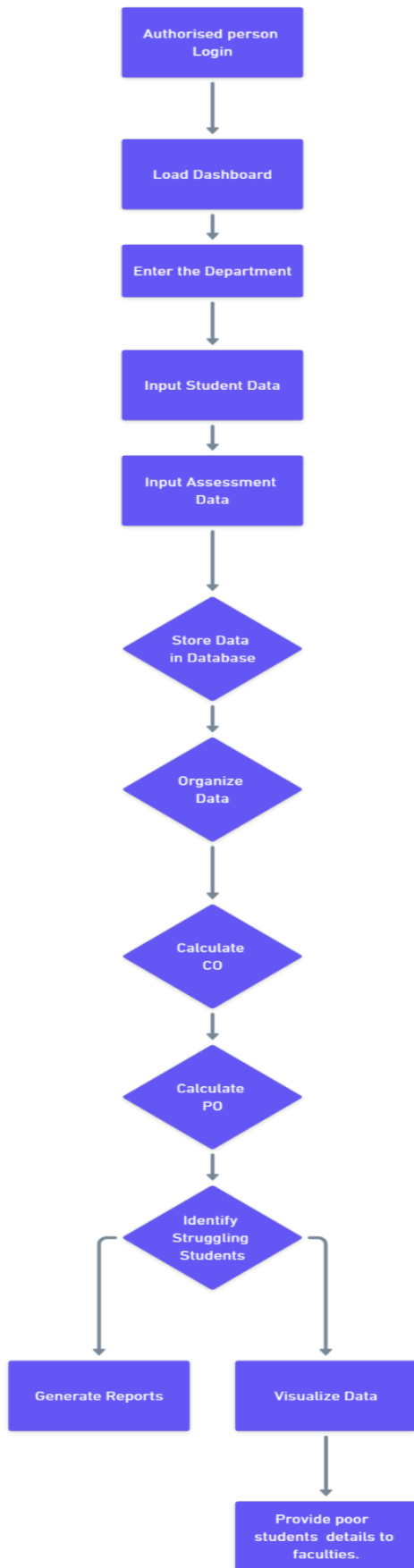
2)Usability
For administrators and educators, the platform should have a low learning curve and be simple to use.

3) Data Security and privacy:
The platform should ensure the security and privacy of student performance data, including encryption, access controls, and auditing

FLOW DIAGRAM:

```
┌─────────────────┐
│ Authorised person│
│      Login       │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  Load Dashboard  │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│Enter the Department│
└─────────────────┘
         │
         ▼
┌─────────────────┐
│ Input Student Data│
└─────────────────┘
         │
         ▼
┌─────────────────┐
│ Input Assessment │
│      Data        │
└─────────────────┘
         │
         ▼
      ◇ Store Data ◇
      ◇ in Database ◇
         │
         ▼
      ◇ Organize ◇
      ◇   Data   ◇
         │
         ▼
      ◇ Calculate ◇
      ◇    CO     ◇
         │
         ▼
      ◇ Calculate ◇
      ◇    PO     ◇
         │
         ▼
      ◇  Identify   ◇
      ◇ Struggling  ◇
      ◇  Students   ◇
     ┌───┘      └───┐
     ▼              ▼
┌──────────┐  ┌──────────┐
│ Generate │  │ Visualize│
│ Reports  │  │   Data   │
└──────────┘  └──────────┘
                   │
                   ▼
              ┌──────────┐
              │Provide poor│
              │students details to│
              │ faculties. │
              └──────────┘
```

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ACADEMIC PERFORMANCE TRACKER

Screen 1 — Login

Welcome Back !

BANNARI AMMAN
INSTITUTE OF TECHNOLOGY
Stay Ahead

BIT Performance tracker

Google Sign In

Sign in with your BIT Account

Screen 2 — Select Activity

HOME

Select Activity:

- Periodical Test I
- Periodical Test II
- Innovative Practice I
- Innovative Practice II
- End Semester

Screen 3 — Faculty Entry

HOME · PERIODICAL I · PERIODICAL II · ATTENDANCE · END SEMESTER

Faculty Name:

Course code-Name:

| Reg.No	Student Name	PT I(50)	PT II(50)	OP(50)	IP(20)
xxxxx	yyyy				
xxxxx	yyyy				
xxxxx	yyyy				
xxxxx	yyyy				
xxxxx	yyyy				
xxxxx	yyyy				

Screen 4 — Attendance

HOME · PERIODICAL I · PERIODICAL II · ATTENDANCE · END SEMESTER

Course code-Name:

Total no.of students:

Total present:

No.of absenties:

Reg no	Student name:	PT I	PT II	END SEMESTER
xxxx	yyyyy	Present	Present	Present
xxxx	yyyyy	Present	Present	Present
xxxx	yyyyy	Present	Absent	Present
xxxx	yyyyy	Absent	Present	Present
xxxx	yyyyy	Present	Absent	Present

Screen 5 — PT I Marks

HOME · PERIODICAL I · PERIODICAL II · ATTENDANCE · END SEMESTER

PT I

Total no.of students:

No.of students present:

Reg.no	Student Name	Marks allocated CO I	CO II	CO III	Marks obtained CO I	CO II	CO III
xxx	yyyy	20	20	10			
xxx	yyyy	20	20	10			
xxx	yyyy	20	20	10			
xxx	yyyy	20	20	10			
xxx	yyyy	20	20	10			

Screen 6 — PT I CO Attainment

HOME · PERIODICAL I · PERIODICAL II · ATTENDANCE · END SEMESTER

Target CO's:

Total no.of students:

No.of student present:

Reg.no	Student Name	CO Attainment % CO I	CO II	CO III	Attainment of CO'S CO I	CO II	CO III
xxx	yyyy				1	1	1
xxx	yyyy				1	1	1
xxx	yyyy				1	1	1
xxx	yyyy				1	1	1
xxx	yyyy				1	1	1

Screen 7 — PT II Marks

HOME · PERIODICAL I · PERIODICAL II · ATTENDANCE · END SEMESTER

PT II

Total no.of students:

No.of students present:

Reg.no	Student Name:	Marks allocated CO III	CO IV	CO V	Marks obtained CO III	CO IV	CO V
xxxx	yyyyy	10	20	20			
xxxx	yyyyy	10	20	20			
xxxx	yyyyy	10	20	20			
xxxx	yyyyy	10	20	20			
xxxx	yyyyy	10	20	20			

Screen 8 — PT II CO Attainment

HOME · PERIODICAL I · PERIODICAL II · ATTENDANCE · END SEMESTER

Target CO's:

Total no.of students:

No.of student present:

Reg.no	Student Name	CO Attainment % CO III	CO IV	CO V	Attainment of CO'S CO III	CO IV	CO V
xxx	yyyy				1	1	1
xxx	yyyy				1	1	1
xxx	yyyy				1	1	1
xxx	yyyy				1	1	1
xxx	yyyy				1	1	1

Screen 9 — SEM Marks

HOME · PERIODICAL I · PERIODICAL II · ATTENDANCE · END SEMESTER

SEM

Total no.of students:

No.of students present:

Reg.no	Student Name	Marks allocated CO I	CO II	CO III	CO IV	CO V	Marks obtained CO I	CO II	CO III	CO IV	CO V
xxxx	yyyyy	20	20	20	20	20					
xxxx	yyyyy	20	20	20	20	20					
xxxx	yyyyy	20	20	20	20	20					
xxxx	yyyyy	20	20	20	20	20					
xxxx	yyyyy	20	20	20	20	20					

Screen 10 — SEM CO Attainment

HOME · PERIODICAL I · PERIODICAL II · ATTENDANCE · END SEMESTER

SEM

Target CO's:

Total no.of students:

No.of students present:

Reg.no	Student Name:	CO Attainment % CO I	CO II	CO III	CO IV	CO V	Attainment of CO's CO I	CO II	CO III	CO IV	CO V
xxxx	yyyyy						1	1	1	1	1
xxxx	yyyyy						1	1	1	1	1
xxxx	yyyyy						1	1	1	1	1
xxxx	yyyyy						1	1	1	1	1
xxxx	yyyyy						1	1	1	1	1

Screen 11 — Level & Direct Assessment

HOME · PERIODICAL I · PERIODICAL II · ATTENDANCE · END SEMESTER

Name	Level	Range from:	Range to:
Level 0	0	0	50
Level 1	1	50	60
Level 2	2	60	70
Level 3	3	70	100

Direct assesment:		CO1	CO 2	CO 3	CO 4	CO 5
PT 1	0.15					
PT 2	0.15					
IP 1	0.1					
IP 2	0.1					
ESM	0.5					
Continuous Internal Evaluation (CIE)						
Direct CO Attainment (100%)						
Final CO Attainment Level Direct CO Att. + 20% CES)	80%					

Screen 12 — Articulation Matrix

HOME · PERIODICAL I · PERIODICAL II · ATTENDANCE · END SEMESTER

Articulation Matrix

C.no	Po1	Po2	Po3	Po4	Po5	Po6	Po7	Po8	Po9	Po10	Po11	Po12	PSO1	PSO2	PSO3
1															
2															
3															
4															
5															
Avg															

Screen 13 — PO-PSO Attainment percentage

HOME · PERIODICAL I · PERIODICAL II · ATTENDANCE · END SEMESTER

PO-PSO Attainment percentage

C.no	Po1	Po2	Po3	Po4	Po5	Po6	Po7	Po8	Po9	Po10	Po11	Po12	PSO1	PSO2	PSO3
1															
2															
3															
4															
5															
po															
pso															
level															