



PROJECT REPORT

DATABASE MANAGEMENT

CSE 303

GROUP 03

SECTION 04

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Contents

CH-1 INTRODUCTION:	3
BACKGROUND OF THE ORGANIZATION:	3
BACKGROUND OF THE PROJECT:	4
OBJECTIVES OF THE PROJECT:.....	5
SCOPE OF THE PROJECT.....	5
CH-2: REQUIREMENT ANALYSIS	6
EXISTING BUSINESS SYSTEM (WITH RICH PICTURE)	6
PROCESSES ALONG WITH SIX SYSTEM ELEMENT ANALYSIS	7
PROCESS DIAGRAM (As Is)	51
EXISTING PROBLEMS & ANALYSIS OF THE PROBLEM	57
PROPOSED BUSINESS SYSTEM (WITH RICH PICTURE)	58
PROPOSED PROCESSES ALONG WITH SIX SYSTEM ELEMENT ANALYSIS.....	59
PROCESS DIAGRAM (To Be).....	85
CH-3 LOGICAL SYSTEM DESIGN	91
BUSINESS RULES	91
ENTITY RELATIONSHIP DIAGRAM (ERD)	94
ERD TO RELATIONS.....	95
NORMALIZATION.....	96
DATA DICTIONARY.....	99
CH-4 PHYSICAL SYSTEM DESIGN.....	110
INPUT FORMS.....	110
OUTPUT QUERY & REPORTS	111
CH-5 CONCLUSION	119
PROBLEM & SOLUTION	119
ADDITIONAL FEATURE & FUTURE DEVELOPMENT	119
CONCLUSION & RECOMMENDATIONS	119

CH-1 INTRODUCTION:

BACKGROUND OF THE ORGANIZATION:

Independent University, Bangladesh (IUB) established in 1993 is the leading private university in Bangladesh with an explicit focus on Research and Global partnerships.

The Independent University, Bangladesh (IUB) has robust and versatile schools – notably consisting of following:

- Business & Entrepreneurship
- Engineering, Technology & Sciences
- Environment and Life Sciences
- Liberal Arts & Social Sciences
- Pharmacy and Public Health.

The institution has actively contributed to the development of the education industry in Bangladesh and has produced competent and knowledgeable scholars who have made contributions both domestically and internationally. The University Grants Commission (UGC), the Ministry of Education, and other necessary institutions for each of the schools, along with regular curriculum updates, the implementation of a system to track student performance based on a quantified approach between course curriculum and standards set by UGC and the Bangladesh government, and ongoing student performance monitoring have all helped IUB achieve this.

The objectives of IUB are to produce graduates of international standards in the local environment who have the knowledge and necessary skills to provide leadership in business, public service, and welfare; to encourage and support useful research; to create knowledge; and to offer opportunities for adults to continue their education.



Figure 1: Independent University, Bangladesh

BACKGROUND OF THE PROJECT:

Our project's goal is to create, develop, and distribute software that, in our opinion, will assist universities worldwide in promoting a more fruitful and efficient method of student evaluation. As the central concept of our project, we've introduced the notion of Course Outcomes (COs) and Program Learning Outcomes (PLOs), where each CO is mapped to a PLO, and each PLO represents a particular valuable skill that students are expected to acquire or improve at the conclusion of that course, such as problem analysis, design, implementation of a skill and spider chart.

The details will all be present in the course outline for the students to have easy access and have all the necessary details regarding a course. The project will determine whether each student has successfully completed the PLOs that are linked to the COs requirements in order to evaluate them effectively through tools such as spider charts. IEB input is accepted by the system when establishing PLO criteria. For the system to map the COs to PLO appropriately, the faculties then input the COs for each of their students. It was discovered via the execution of this project that the efficiency not only reduced time but also increased quality. The PLOs are carefully and deliberately selected to guarantee that each student gets the most skills out of a course.

We also have the feature where faculties can input the questions in the question bank which can be accessed by the students which will help them gain knowledge on their desired topics and will provide them a vast field to practice.

Students can monitor their progress in each area and identify their areas for growth and improvement. Our program also aims to help the institutional bodies, including faculty, administrative, and departmental bodies, track student development, departmental performance, and better distribute and allocate resources.

OBJECTIVES OF THE PROJECT:

Our project aims to develop an interactive, user-friendly program that will serve as a platform for university staff, faculty, and other participants to assist in enhancing the standard of instruction and revolutionizing how we incorporate technology into our education. We are confident that the information we have gathered, assessed, and organized will open doors for significant improvements in the educational sector as well as the field of computer science. In this situation, SMPS will broaden the project's scope in order to benefit all the departments

SCOPE OF THE PROJECT

Our approach entails building a Web application called SPMS 2 that makes use of a Relational Database Management System (RDMS) to store, edit, add, and update the data required for tracking student performance as well as for producing and archiving related OBE data, reports, and documents. We created hypothetical users for the web based SPMS system and made assumptions about their usage patterns and the information and data they would require. Since issues can occur at many different points throughout all business processes, we will create unique user interfaces and login options for various stakeholders who will also be using this system. Since our data is stored using a (RDBMS), obtaining relevant files, tabular data, and page layouts is made possible and reports become exceedingly simple, enabling real-time interaction with the required data. Additionally, we develop user interfaces that allow all users to quickly access these data and use them to produce download reports, etc. We create a platform through which faculties may work together to create course outline, course reports, marksheets, assessments, map assessments to COs and PLOs for PLO successes, and keep track of student evaluations for all their courses throughout the semester and upload questions in the question bank for the students. The systems for reaching findings are also available to students, the IUB leadership team, and governmental organizations. Each stakeholder will only see the data that is specifically relevant to them, and data will also be protected.

CH-2: REQUIREMENT ANALYSIS

EXISTING BUSINESS SYSTEM (WITH RICH PICTURE)

We create a platform through which faculties may work together to create course descriptions, course reports, marksheets, assessments, map assessments to COs and PLOs for PLO successes, and keep track of student evaluations for all their courses throughout the semester and upload questions in the question bank for the students. The systems for reaching findings are also available to students, the IUB leadership team, and governmental organizations. Each stakeholder will only see the data that is specifically relevant to them, and data will also be protected. Student responses to questions posed by the faculty are then given back to the faculty. The system receives the assessment records after it has been completed and stores them. The system keeps a record of every report.

The system offers all users illuminating bar graphs, pie charts, and tables that display PLO achievement for all students, PLO achievement for a specific student, and PLO achievement regarding certain courses. Student responses to questions posed by the faculty are then given back to the faculty. The system receives the assessment records after it has been completed and stores them. The system keeps a record of every report.

The system offers all users illuminating bar graphs, pie charts, and tables that display PLO achievement for all students, PLO achievement for a specific student, and PLO achievement about certain courses.

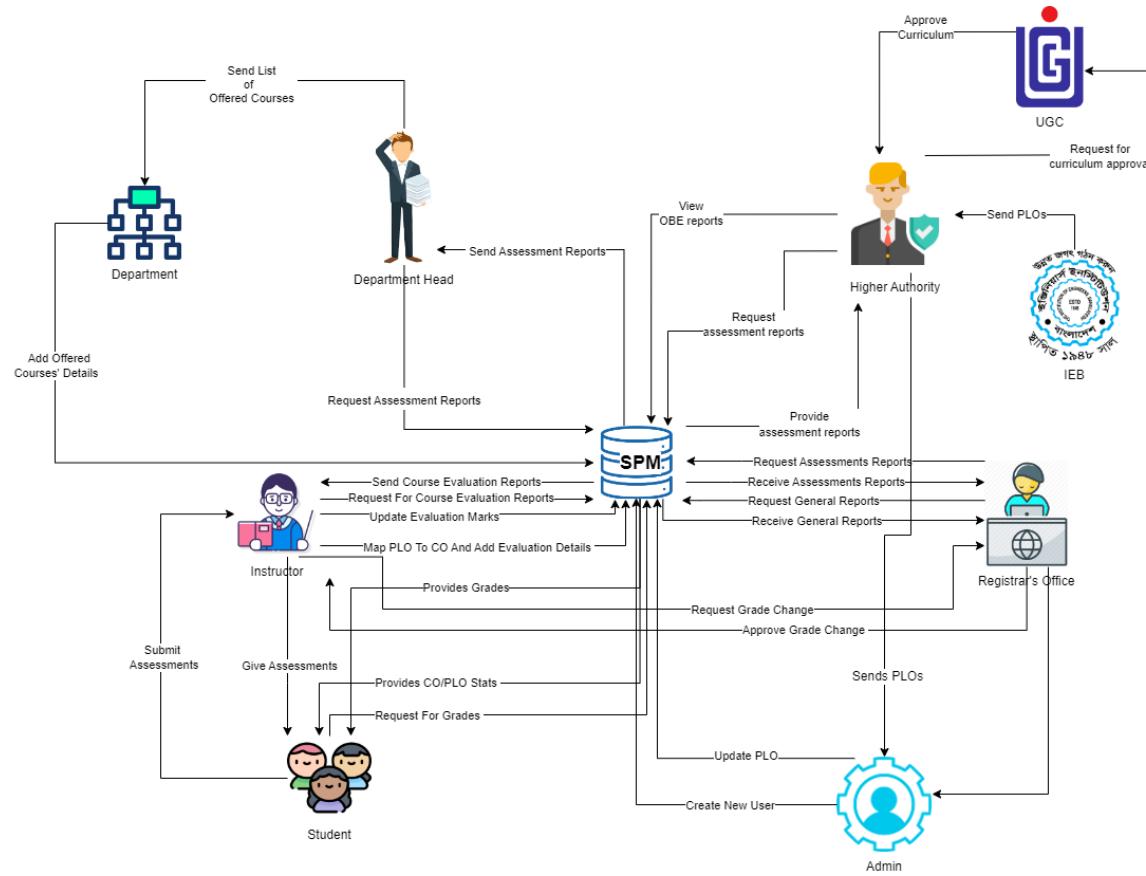


Figure 2: Rich Picture of Existing System

PROCESSES ALONG WITH SIX SYSTEM ELEMENT ANALYSIS

The Six Elements Analysis gives a thorough explanation of each element's function in each process. The table below makes it very evident that human entities predominate all important system operations, particularly the two most important ones—mapping course outcomes and examining documents associated with them. The existing approach, for instance, relies significantly on manually handled and processed hardcopy databases. As a result, there is a considerable amount of waiting involved in the interdependent processes before the Human components may perform their obligations.

Process	System Roles					
	Human	Non-Computing Hardware	Computing Hardware	Software	Database	Network and Communication
Student Enrollment a) Search for the website b) Goes to the website. c) Clicks on the form option. c) Fill up the form with required Information. Registrar's Office: a) Checks and verifies	Student: a) Used to collect information about students through enrollment forms.	Paper and Stationery: a) Admin will use Computers to access and update data. b) Users will use the computer to view the data.	Computer/ Laptop a) SPMS Database Server a) Used by SPMS Developers to collect data and	Operating Software a) Utilized by Registrar Office and SPMS. b) Uses to fill up the form from the website. SPMS a) The software for which the administrator will set up user accounts.	Register Office Database a) Used by the registrar's office to compile student data into an excel file for sending to SPMS. SPMS a) For any upgrades or new user accounts, information is kept in the database. Excel	Internet a) To access and store data to SPMS it is used. b) It is used to collect the student form from the student to registrar office. c) The Registrar office sends all the student information to SPM admin by using it.

	<p>student enrollment information from the forms from the website or hardcopy forms</p> <p>b) Registrar Office's Admin logs into the system using Admin-ID and password.</p> <p>c) Sends verified student information as an</p>		<p>maintain the software.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a) Used to access SP MS</p>		<p>a) Data from student accounts may be kept in an excel file and used later in SPMS.</p>	
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	attachmen t to Admin/Te am. Admin: a) Admin logs into the system using SPMS User-ID and password. b) Receives the student enrollmen t informatio n in the attached files. c) Admin updates the student					
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	<p>enrollment information in Database.</p> <p>d) Notifies respected Stakeholders</p> <p>Department Head:</p> <p>a) Logs into the system using them</p> <p>User-ID and password.</p> <p>b) Inputs the desired time period for number of students enrolled.</p> <p>Higher Authority</p>					

	<p>(VC/ Dean):</p> <p>a) Logs into the system using their User-ID and password.</p> <p>b) Inputs the desired time period and compare School/De partment for the number of students enrolled accordingl y.</p> <p>Faculty:</p> <p>a) logs into the system using</p>					
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	<p>Faculty ID and password</p> <p>b) Inputs the ID of the section the faculty is taking to view the students enrolled.</p>					
Student Performance Based on CGPA	<p>Student:</p> <p>a) Logs into the System using Student-ID and password.</p> <p>b) Inputs the desired time - period to</p>	<p>Computer/ Laptop</p> <p>a) User will need a computer to access SPMS</p> <p>Printer</p> <p>a) Used to print out the report if need be.</p>	<p>Operating Software</p> <p>a) The user uses it to execute SPMS</p> <p>SPMS</p> <p>a) A performance trend will be generated by the software.</p>	<p>SPMS</p>	<p>Internet</p> <p>a) To login into and access the SPMS it is used.</p>	

	<p>view self CGPA Progress.</p> <p>Registrar's Office:</p> <p>a) Logs into the System using User-ID and password.</p> <p>b) Inputs the desired time period and School, Department or program to view Statistically analyzed CGPA trend</p>		<p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a) Used to access the Internet.</p>			
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	<p>of students.</p> <p>Departme nt Head:</p> <p>a) Logs into the System using User-ID and password.</p> <p>b) Inputs the desired time- period and school,</p> <p>Departme nt or program.</p> <p>c) View statistica lly analyzed CGPA trend of students or</p>					
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	<p>any individual student.</p> <p>Faculty:</p> <p>a) Logs into the system using Faculty-ID and password.</p> <p>b) Inputs the desired time-period and program to view statistically analyzed CGPA trend of students or any</p>					
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	<p>individual student those who attended the faculty's Section.</p> <p>Higher Authority:</p> <p>a) Logs into the system using their User-ID and password.</p> <p>b) Inputs the desired time-period, School and Department</p> <p>c) View</p>				
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	statistically analyzed CGPA trend of students.					
Course-wise student performance based on CGPA	<p>Student:</p> <ul style="list-style-type: none"> a) Logs into the system using Student-ID and password. b) Inputs the course c) View self GPA for the course. <p>Department Head:</p> <ul style="list-style-type: none"> a) Logs into the System 	<p>Computer/ Laptop</p> <p>a) User will need a computer to access SPMS</p> <p>Printer</p> <p>a) Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a) Used to access the Internet.</p>	<p>SPMS</p> <p>a) A performance trend based on GPA will be generated by the software.</p>	<p>SPMS</p>	<p>Database</p> <p>a) Here, the performance will be stored and updated.</p>	<p>Internet</p> <p>a) To login into and access the SPMS it is used.</p>

	<p>using User-ID and password.</p> <p>b) Inputs the desired time-period</p> <p>Course-ID</p> <p>c) View statistically analyzed GPA trend of Students.</p> <p>Registrar's office:</p> <p>a) Logs into the System using Admin-ID and password.</p> <p>b) Inputs the desired time</p>					
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	<p>-period and coursed c) view statistica y analyzed GPA trend of students.</p> <p>Faculty:</p> <p>a) Logs into the System using Faculty- ID and password.</p> <p>b) Inputs the desired time - period Course-ID under the faculty</p>					
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	c) view statistically analyzed GPA trend of students who faculty's section. Higher Authority: a) Logs into the system using their User-ID and password. b) Inputs the desired time-period and Course-ID c) View statistically analyzed					
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	GPA trend of students for that specific course.					
Selective Number of Instructor-wise student performance based on the GPA	<p>Department Head:</p> <p>a) Logs into the system using User-ID and password.</p> <p>b) Inputs the desired time-period</p> <p>Course-ID</p> <p>c) View statistically analyzed GPA trend of</p>	<p>Computer/Laptop</p> <p>a) User will need a computer to access SPMS</p> <p>Printer</p> <p>a) Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a) Used to access the</p>	<p>SPMS</p> <p>a) a) The software will produce a performance trend for a specified instructor.</p>	<p>SPMS</p>	<p>Internet</p> <p>a) To login into and access the SPMS it is used.</p>	<p>Database</p> <p>a) Here, the performance will be stored and updated.</p>

	<p>students for a selective number of Instructors . Registrar's office:</p> <ul style="list-style-type: none">a) Logs into the system using Admin-ID and password.b) Inputs the desired time-period Course-IDc) View statistically analyzed GPA trend of		Internet.			
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	<p>students for a selective number of Instructors Faculty: a) Logs into the system using Faculty- ID and password. b) Inputs the desired time - period & Course-ID c) View statistica y analyzed GPA trend of students for a</p>					
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	<p>selective number of Instructors . . . Higher Authority: a) Logs into the System using User-ID and password. b) Inputs the desired time- period Course- ID c) View statistica y analyzed GPA trend of</p>					
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	students for a selective number of Instructors .					
VC-wise, dean-wise, or departmen t head- wise student performan ce	Departme nt Head: a) Logs into the system using User-ID and password. b) Select Input from from VC/Dean/ Departme nt Head c) View the student	Computer/ Laptop a) User will need a computer to access SPMS Printer a) Used to print out the report if need be.	SPMS a) The software will produce a performance trend	SPMS a) Here, the performance will be stored.	Internet a) To login into and access the SPMS it is used.	

	<p>performance trend as per choice.</p> <p>Registrar's office:</p> <p>a) Logs into the system using User-ID and password.</p> <p>b) Select Input from from VC/Dean/ Department Head</p> <p>c) View the student performance trend as per</p>		<p>Bridge, Hub):</p> <p>a) Used to access the Internet.</p>			
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	<p>choice.</p> <p>Dean or VC</p> <p>a) Logs into the system using User-ID and password.</p> <p>b) Select Input from from VC/Dean/ Department Head</p> <p>c) View the student performance trend as per choice.</p>					
Instructor-wise student	Department Head:		Computer/ Laptop	SPMS a) The software will	SPMS Database	Internet a) To login into and

<p>performance based on the GPA of the students</p> <p>Department-I D and Password.</p> <p>b) Inputs a particular instructor Name/ID</p> <p>c) View the student performance trend of selected Instructor.</p> <p>Registrar's office:</p> <p>a) Logs into the system using User-ID and</p>	<p>a) Logs into the system using</p> <p>Printer</p> <p>a) Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a) Used to access the Internet.</p>	<p>a) User will need a computer to access SPMS</p>	<p>produce a performance trend</p>	<p>a) The performance will be stored and updated in the database.</p>	<p>access the SPMS it is used.</p>
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	<p>password.</p> <p>b) Inputs a particular instructor</p> <p>c) View the student performance trend of selected Instructor.</p> <p>Faculty:</p> <p>a) Logs into the system using User-ID and password.</p> <p>b) Input their Name/ID.</p> <p>c) View the student performance</p>				
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	trend. Dean a) Logs into the system using User-ID and password. b) Inputs a particular instructor c) View the student performan ce trend of selected instructor VC a) Logs into the system using User-ID and					
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	<p>password.</p> <p>b) Inputs a particular instructor</p> <p>c) View the student performance trend of selected instructor.</p>					
Total PLO percentage achieved and attempted by the student along with the departmental average	<p>Student:</p> <p>a) Logs into the system using Student-ID and Password</p> <p>b) Inputs the time-period</p> <p>c) Views their comparison</p>	<p>Computer/ Laptop</p> <p>a) User will need a computer to access SPMS</p> <p>Printer</p> <p>a) Used to print out the report if need be.</p>	<p>Operating system</p> <p>a) Used by the SPMS</p> <p>SPMS</p> <p>a) A comparison of the attempted vs. achieved PLO as well as the departmental average will</p>	<p>SPMS</p> <p>a) Here, the performance will be stored.</p>	<p>Internet</p> <p>a) To login into and access the SPM it is used.</p>	

	<p>of attempted vs achieved PLO percentage along with the departmental Average.</p> <p>Department Head:</p> <ul style="list-style-type: none"> a) Logs into the system using User-ID and Password b) Inputs the time-period c) Views the comparison 		<p>Networking Devices (Router, Switch, Bridge, Hub):</p> <ul style="list-style-type: none"> a) Used to access the Internet. 	<p>be produced by the software.</p>		
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	n of students attempted PLO vs achieved PLO percentage along with the departmental average. Registrar's office: a) Logs into the system using User-ID and Password b) Inputs the time-period c) Views the					
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	<p>comparison of students Attempted PLO vs achieved PLO percentage along with the departmental average.</p> <p>Faculty:</p> <p>a) Logs into the system using User-ID and Password.</p> <p>b) Inputs the time period.</p> <p>c) Views the</p>					
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	<p>comparison of students attempted PLO vs achieved PLO percentage along with the departmental Average.</p> <p>Dean</p> <p>a) Logs into the system using User ID and Password</p> <p>b) Inputs the time period</p> <p>c) Views the</p>					
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	<p>comparison of students Attempted PLO vs achieved PLO percentage along with the departmental average.</p> <p>VC</p> <p>a) Logs into the system using User-ID and Password.</p> <p>b) Inputs the time-period.</p> <p>c) Views the</p>					
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	comparison of students attempted PLO vs achieved PLO percentage along with the departmental average.					
PLO achievement	<p>Student:</p> <p>a) Logs into the system using Student-ID and password.</p> <p>b) Selects PLO achievement</p>	<p>Computer/ Laptop</p> <p>a) User will need a computer to access SPMS</p> <p>Printer</p> <p>a) Used to print out the report if need be.</p>	<p>SPMS</p> <p>a) A PLO achievement will be generated by the software.</p>	<p>SPMS</p> <p>a) Here, the performance will be stored and updated.</p>	<p>Internet</p> <p>a) To login into and access the SPM it is used.</p>	

	c) View PLO Achievement.		Networking Devices (Router, Switch, Bridge, Hub):			
	Department Head: a) Logs into the System using user-ID and password. b) Selects PLO achievement. c) View PLO Achievement.		a) Used to access the Internet.			

	<p>password.</p> <p>b) Selects PLO achieveme nt.</p> <p>c) View PLO Achievem ent.</p> <p>Faculty:</p> <p>a) Logs into the System using Faculty- ID and password.</p> <p>b) Selects PLO Achievem ent.</p> <p>c) View PLO Achievem ent.</p> <p>Dean</p>					
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	a) Logs into the System using user-ID and password. b) Selects PLO achieveme nt. c) View PLO Achievem ent. VC a) Logs into the system using user-ID and password. b) Selects PLO achieveme nt.					
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	c) View PLO achievement					
Expected PLO-achievement versus actual score (for course's, student's, Department's, program's or school's)	<p>Student:</p> <p>a) Logs into the system using Student-ID and password.</p> <p>b) Selects PLO achievement comparison</p> <p>c) View PLO achievement</p>	<p>Computer/ Laptop</p> <p>a) User will need a computer to access SPMS</p> <p>Printer</p> <p>a) Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch,</p>	<p>SPMS</p> <p>a) A) The software will calculate the expected vs. achieved PLO.</p>	<p>SPMS</p> <p>a) Database</p> <p>a) The performance will be stored and updated in the database.</p>	<p>Internet</p> <p>a) To login into and access the SPMS it is used.</p>	

	<p>Comparison.</p> <p>Department Head:</p> <p>a) Logs into the system using user-ID and password.</p> <p>b) Selects PLO achievement comparison</p> <p>c) View PLO achievement comparison.</p> <p>Registrar's office:</p> <p>a) Logs into the system</p>		<p>Bridge, Hub):</p> <p>a) Used to access the Internet.</p>			
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	<p>using user-ID and password.</p> <p>b) Selects PLO achievement comparison.</p> <p>c) View PLO achievement comparison.</p> <p>Faculty:</p> <p>a) Logs into the System using Faculty-ID and password.</p> <p>b) Selects PLO achievement</p>					
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	comparison. c) view PLO Achievement comparison. Dean a) Logs into the system using user-ID and password. b) Selects PLO achievement comparison. c) View PLO achievement Comparison. VC					
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	a) Logs into the system using user-ID and password. b) Selects PLO achievement comparison c) View PLO achievement Comparison.					
CO-PLO achievement summary	Student: a) Logs into the system using Student-ID and password.	Computer/ Laptop a) User will need a computer to access SPMS	SPMS a) The software will produce a summary of CO-PLO accomplishments. Printer	SPMS a) The Database will be stored and updated in the database.	Internet a) To login into and access the SPMS it is used.	

	<p>b) Selects CO -PLO achievement summary.</p> <p>c) View CO- PLO achievement summary.</p> <p>Department Head:</p> <p>a) Logs into the system using user-ID and password.</p> <p>b) Selects CO -PLO achievement summary.</p> <p>c) View CO - PLO</p>		<p>a) Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a) Used to access the Internet.</p>			
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	achievement Summary. Registrar's office: a) Logs into the system using user-ID and password. b) Selects CO -PLO achievement summary. c) View CO -PLO achievement Summary. Faculty: a) Logs into the system using					
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	<p>Faculty-ID and password.</p> <p>b) Selects CO -PLO achievement summary.</p> <p>c) View CO - PLO achievement Summary.</p> <p>Dean</p> <p>a) Logs into the system using user-ID and password.</p> <p>b) Selects CO -PLO achievement summary.</p>					
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	c) View CO - PLO achievement Summary. VC a) Logs into the system using user-ID and password. b) Selects CO -PLO achievement summary . c) view CO - PLO achievement summary.					
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PROCESS DIAGRAM (AS IS)

A business process model's graphical representation for describing business processes is called the Business Process Model and Notation (BPMN). We break down each of the business processes outlined in the preceding section using business process model diagrams. Each figure divides the process participants, the interactions among them, and the decisions that each of them must make.

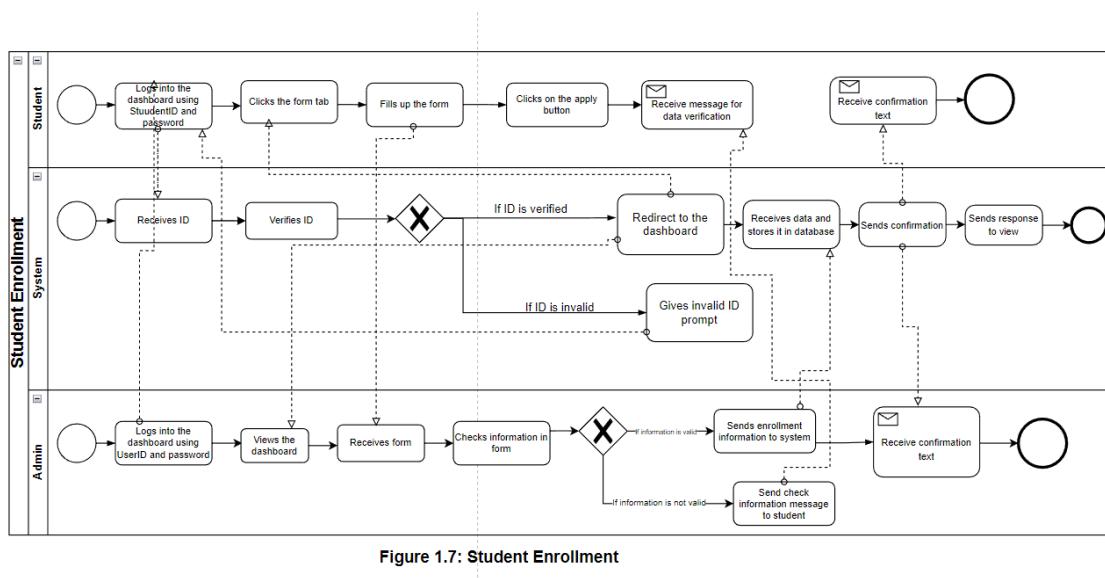


Figure 1.7: Student Enrollment

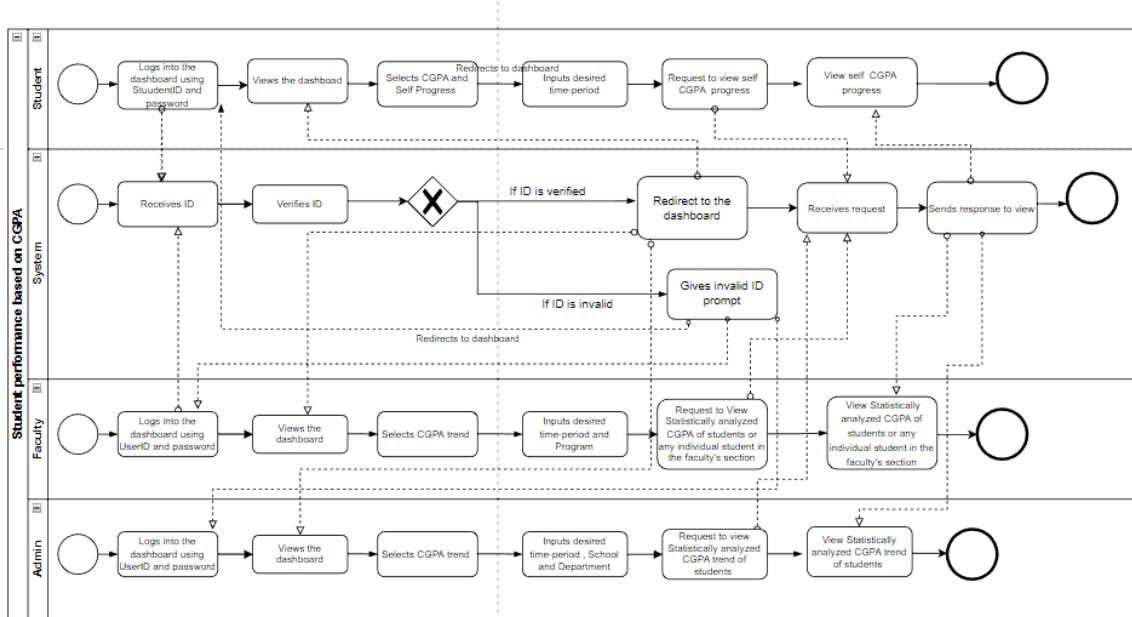


Figure 1.8: Student Performance based on CGPA

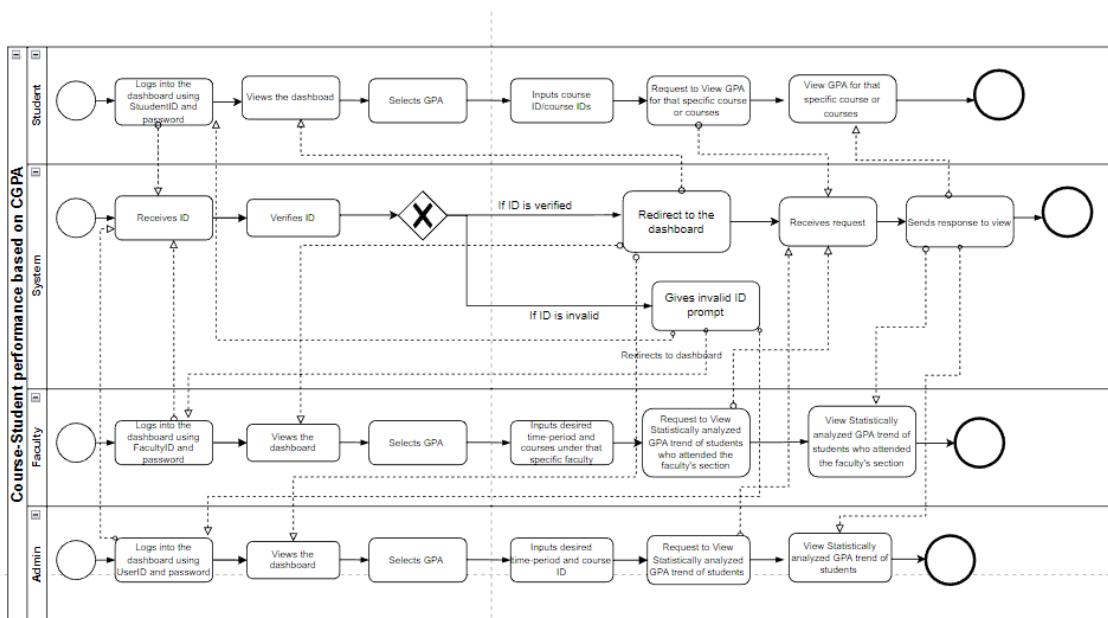


Fig 1.9:Course-Student performance based on CGPA

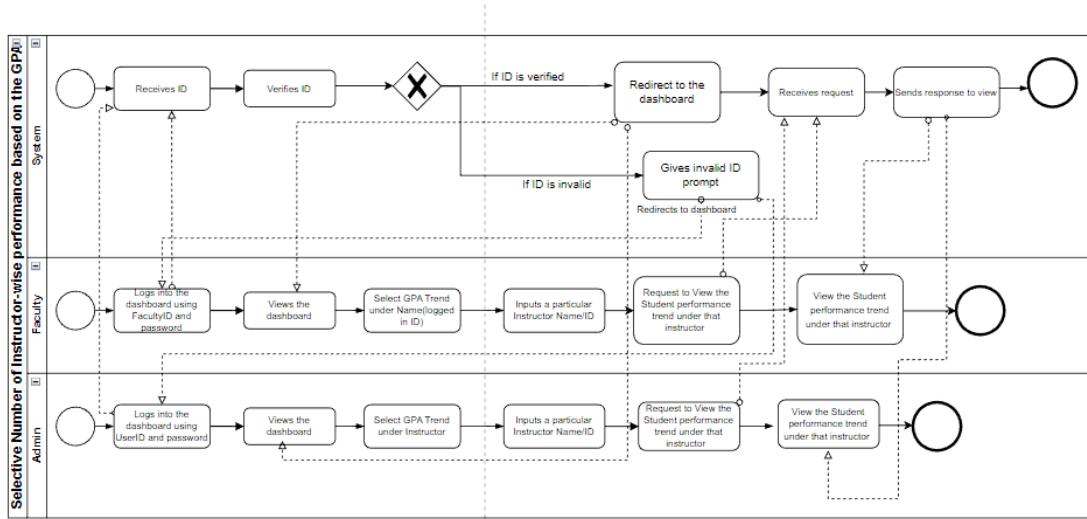


Figure 2.0: Selective Number of Instructor-wise performance based on the GPA

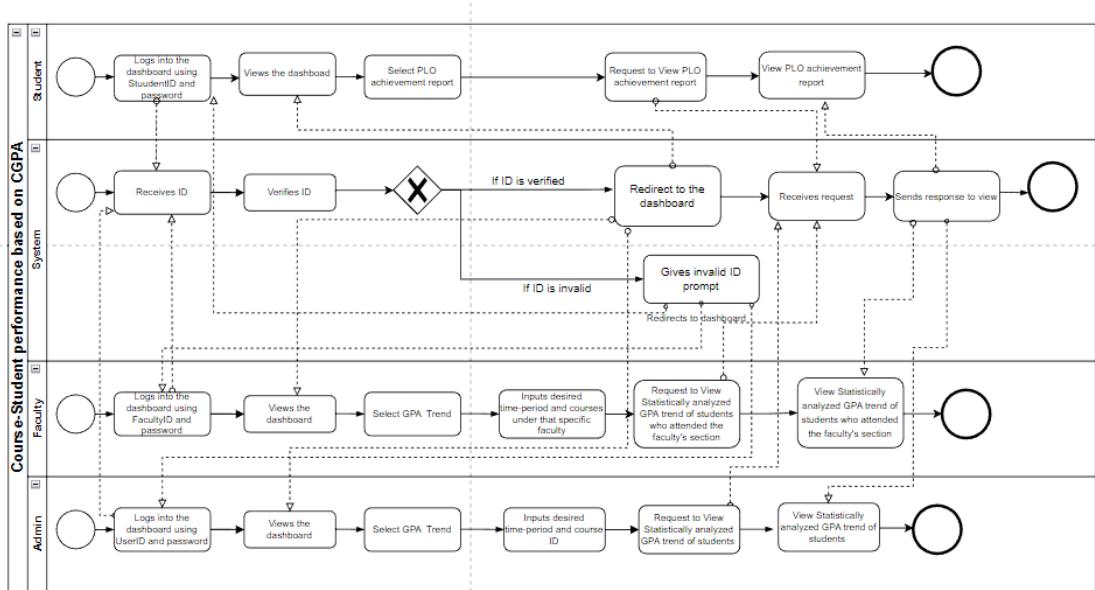


Figure 2.1: Course-wise Student Performance based on GPA

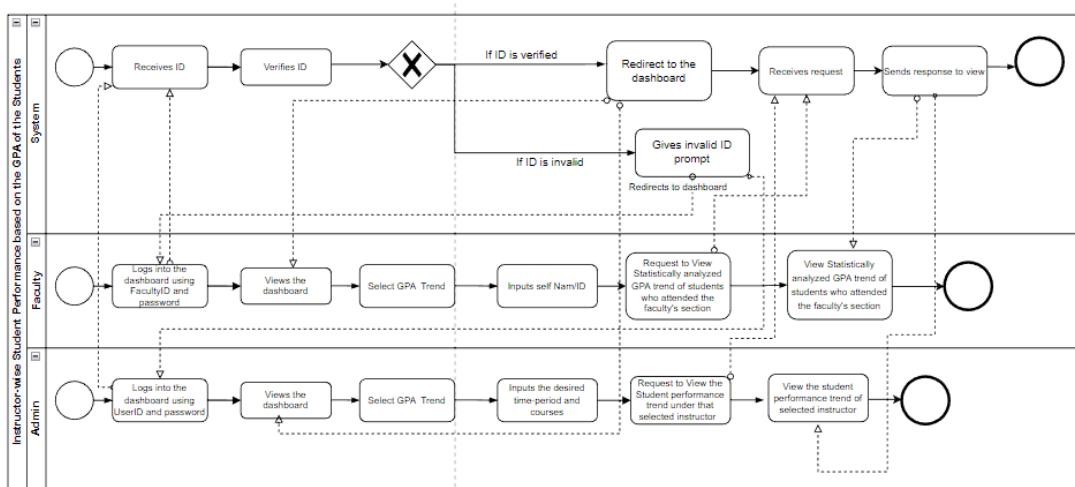


Figure 2.2: Instructor-wise Student Performance based on the GPA of the Students

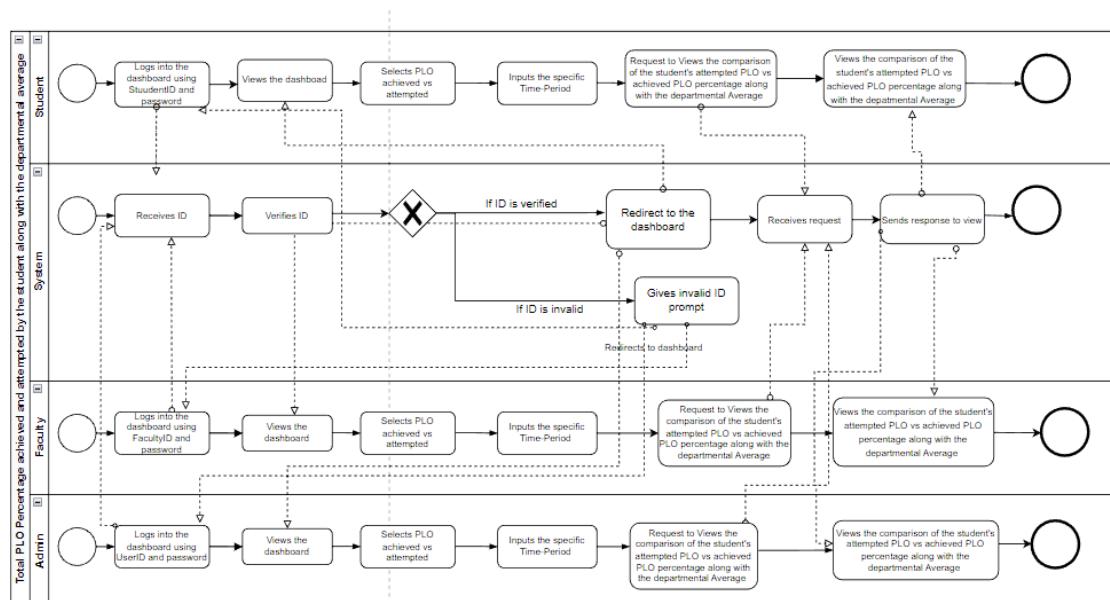


Figure 2.3: Total PLO Percentage achieved and attempted by the student along with the departmental average

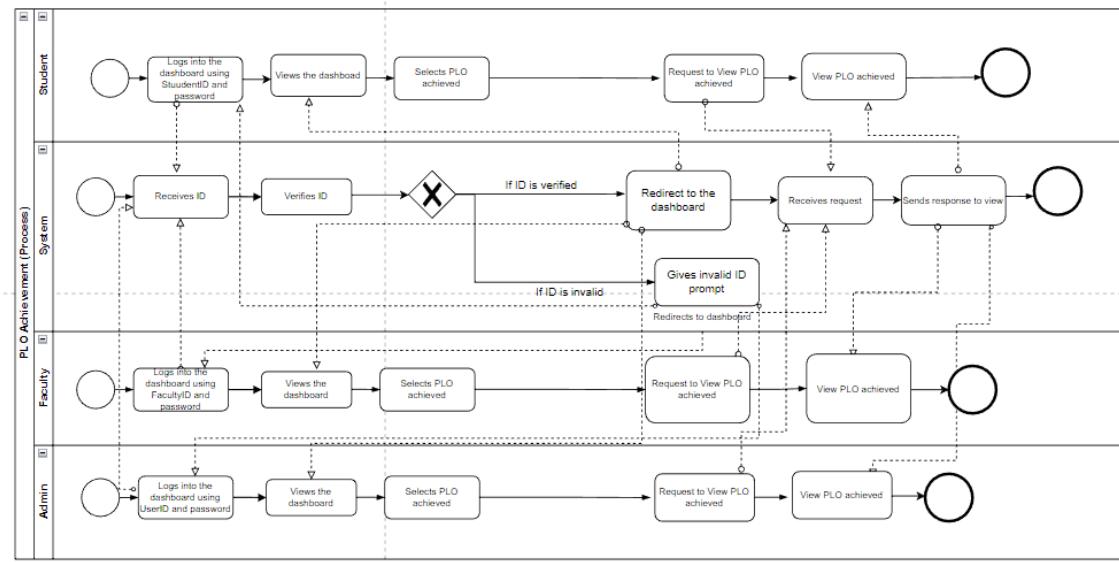


Figure 2.4: PLO Achievement (Process)

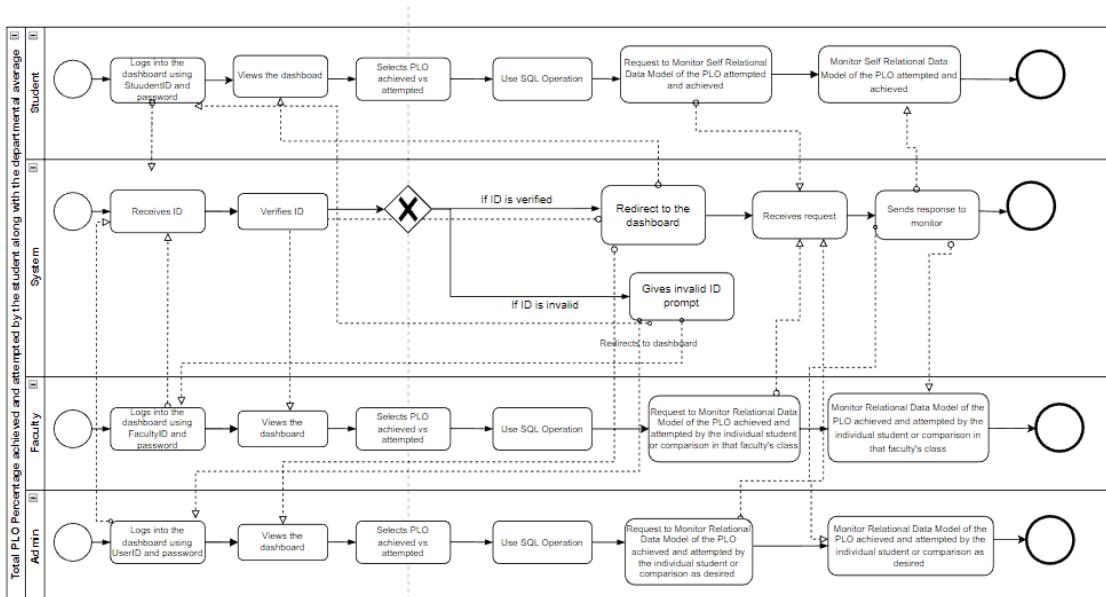


Figure 2.5: Comparison of PLO Achieved vs Attempted (Process)

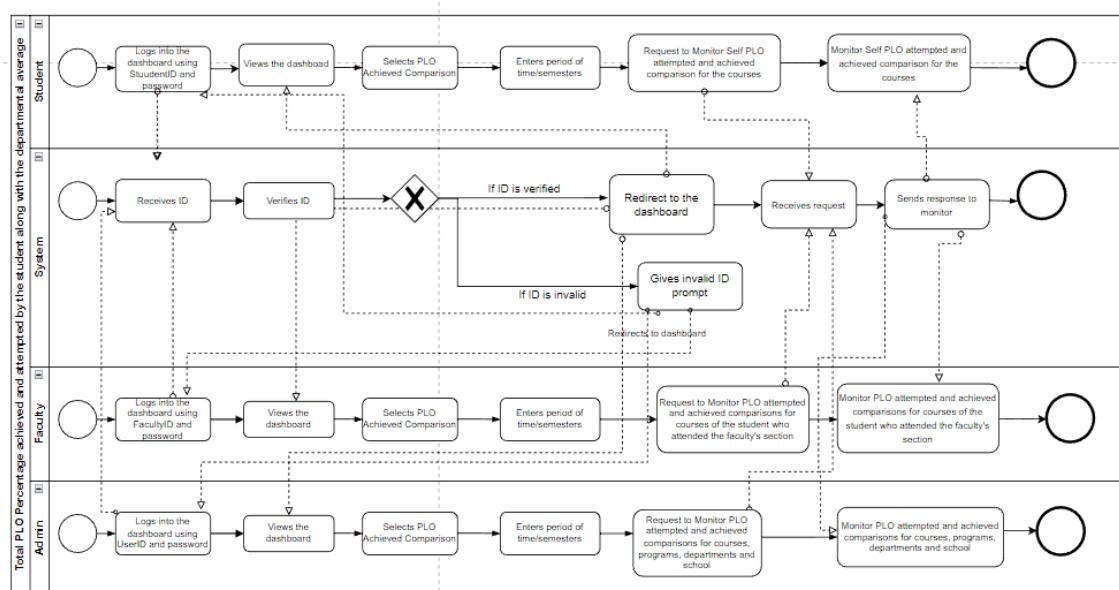


Figure 2.6: Expected PLO Achieved Vs Actual Score (Process)

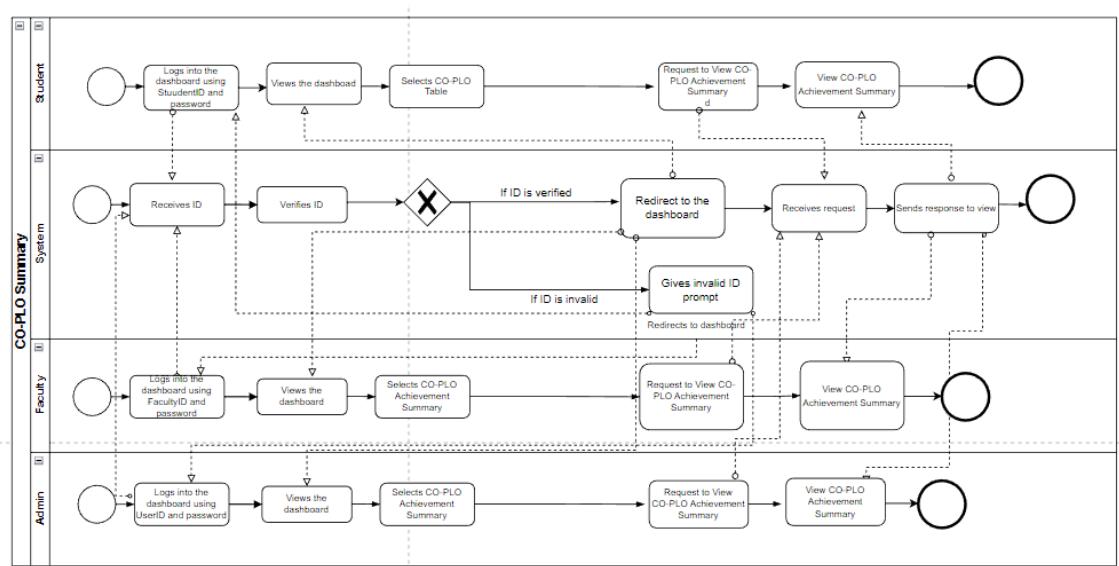


Figure 2.7: CO-PLO Summary (Process)

EXISTING PROBLEMS & ANALYSIS OF THE PROBLEM

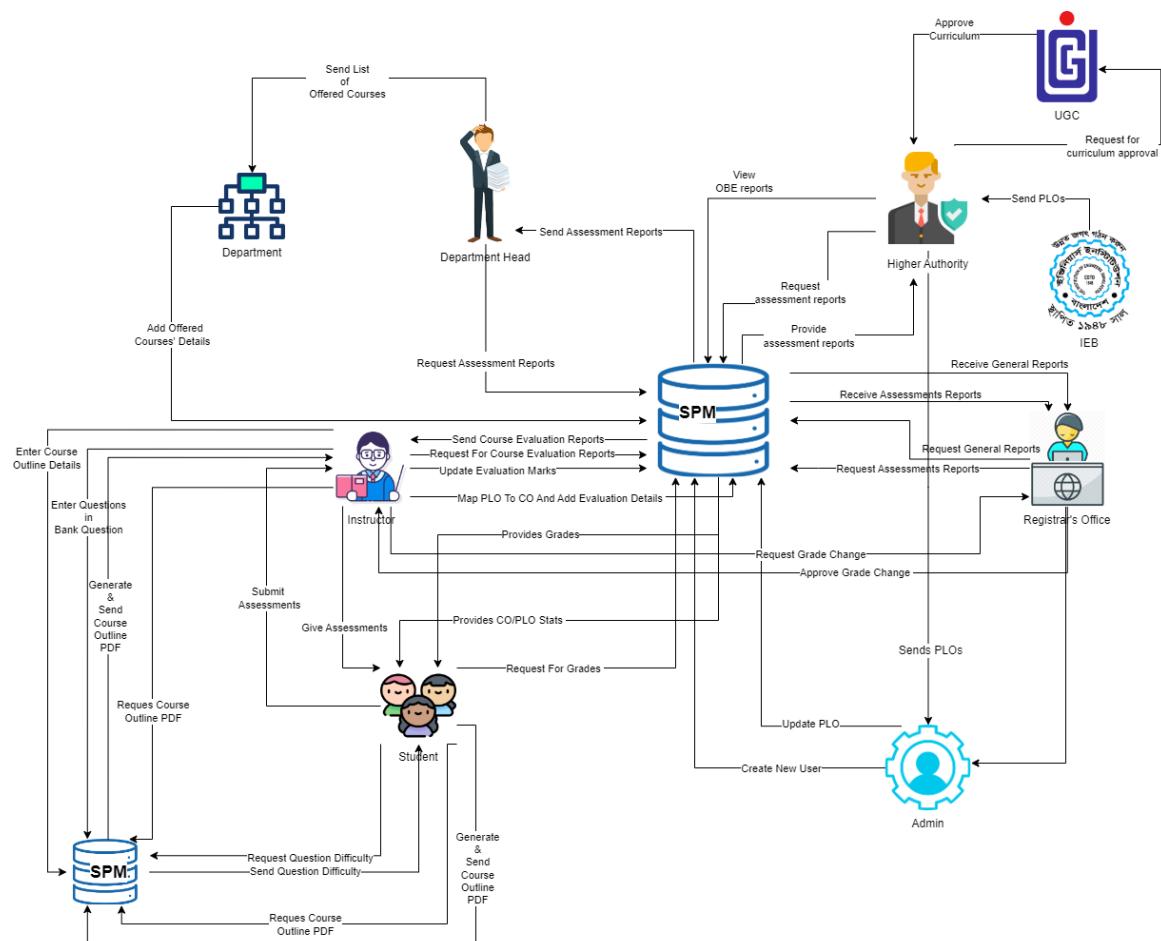
Process Name	Stakeholders	Concerns (Problems)	Analysis (Reason of the Problem)	Proposed Solution
CO-PLO Achievement	1. Student 2. Department Head 3. Registrar's Office 4. Faculty 5. Dean 6. VC	1. Generated reports may not be clear or enough to make assessment.	1. Despite generating several reports, another form of report may prove to be useful to give a clear view of COs and POs achieved.	1. Generating Spider Charts for percentages achieved of both COs and POs.
Question Bank	1. Faculty/Instructor	1. There is no interface for faculties to add assessment materials.	1. Faculty will need an option to add all the assessment materials to the system. 2. The system currently has no unified storage for past and present assessment materials.	1. Faculty will have option to add quiz/mid-term/final-term and assign marks. 2. All assessment materials can be found in one place. 3. The assigned marks will be used to calculate percentage of COs and POs achieved. 4. Difficulty level of question will be mapped from the questions according to the verbs list provided.
Course Outline	1. Faculty/Instructor	1. A feature is needed to generate course outline.	1. A feature is needed to generate course outline after providing some of the key details of course. 2. Some of the key details include course code, grading chart, CO matrix, Bloom's Learning Level, etc.	1. Provide the feature to generate course outline. 2. Provide option to download the generated course outline in a PDF file for all stakeholders involved.

PROPOSED BUSINESS SYSTEM (WITH RICH PICTURE)

The new system will allow the Faculty User to add questions to that exam. The questions will be needed to assign to a CO. The user will be able to add multiple questions under a single exam. And must assign CO with all the questions separately. The user will be given a text box to type the question. After the Faculty User adds the question, the applications will create an option to view the question. In the question view interface, the user will be able to see the domain of learning along with its level.

The faculty user will also be able to assign marks to each of the questions separately, from which the percentage of CO's and POs achieved can be calculated. All the users will be able to see a spider chart of the CO's and POs achieved by the students.

OBE based course outline of a single course will be added by the faculty user and will be available to all users. User will be able to download course outline of a course in a program separately and the user will also be able to download all the course outline of all the courses in a program in a single PDF file.



PROPOSED PROCESSES ALONG WITH SIX SYSTEM ELEMENT ANALYSIS

The six elements analysis of the proposed system is a continuation of an analysis process where each analysis is based on the one that comes before it. Based on the rich picture, the role of each element in the new system is further understood in the table below.

Process	System Roles					
	Human	Non-Computing Hardware	Computing Hardware	Software	Database	Network and Communication
Student Enrollment	Student: a) Search for the website b) Goes to the website. c) Clicks on the form	Paper and Stationery: a) Used to collect information about students through enrollment forms.	Computer/ Laptop a) SPMS admin will use Computers to access and update data.	Operating Software a) Utilized by Registrar Office and SPMS Student a) Uses to fill	Register Office Database a) Used by the registrar's office to compile student data into an excel file for	Internet a) To access and store data to SPMS it is used. b) It is used to collect the student form from

	<p>option.</p> <p>c) Fill up the form with required Information.</p> <p>Admin:</p> <p>a) Admin logs into the system using SPMS User-ID and password.</p> <p>b) Receives the student enrollment information in the attached files.</p> <p>c) Admin</p>	<p>b) Users will use the computer to view the data.</p> <p>Database Server</p> <p>a) Used by SPMS Developers to collect data and maintain the software.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a) Used to access SPMS</p>	<p>up the form from the website.</p> <p>SPMS</p> <p>a) The software for which the administrator will set up user accounts.</p> <p>Excel</p> <p>a) Data from student accounts may be kept in an excel file and used later in SPMS.</p>	<p>sending to SPMS.</p> <p>SPMS</p> <p>a) For any upgrades or new user accounts, information is kept in the database.</p>	<p>to the student to registrar office.</p> <p>c)The Registrar office sends all the student information to SPMS admin by using it.</p>
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	updates the student enrollment information in Database. d) Inputs the desired time period for number of students enrolled.					
Student Performance Based on CGPA	Student: a) Logs into the System using Student-ID and password. b) Inputs the desired	Computer/ Laptop a)User will need a computer to access SPMS	Operating Software a) The user uses it to execute SPMS 2.0	SPMS a) A	Internet a) To login into and access the SPMS it is used.	

	<p>time - period to view self CGPA Progress.</p> <p>Admin:</p> <p>a) Logs into the System using User-ID and password.</p> <p>b) Inputs the desired time period and School, Department or program to view Statistically and analyzed</p>		<p>the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a)Used to access the Internet.</p>	<p>generated by the software.</p>		
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	<p>CGPA trend of students.</p> <p>Faculty:</p> <p>a) Logs into the system using Faculty-ID and password.</p> <p>b) Inputs the desired time-period and program to view statistically analyzed CGPA trend</p>					
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	of students or any individual student those who attended the faculty's Section.					
Course-wise student performance based on CGPA	<p>Student:</p> <p>a) Logs into the system using Student-ID and password.</p> <p>b) Inputs the course</p> <p>c) View self GPA for the</p>	<p>Computer/ Laptop</p> <p>a) User will need a computer to access SPMS</p> <p>Printer</p> <p>a) Used to print out the report if need be.</p> <p>Networking Devices (Router,</p>	<p>SPMS</p> <p>a) A performance trend based on GPA will be generated by the software.</p>	<p>SPMS</p>	<p>Internet</p> <p>a) To login into and access the SPMS it is used.</p>	

	<p>course.</p> <p>Admin:</p> <ul style="list-style-type: none"> a) Logs into the System using User-ID and password. b) Inputs the desired time-period Course-ID c) View statistically analyzed GPA trend of Students. <p>Faculty:</p> <ul style="list-style-type: none"> a) Logs into the System using Faculty-ID and 		<p>Switch, Bridge, Hub):</p> <p>a)Used to access the Internet.</p>			
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	<p>password.</p> <p>b) Inputs the desired time - period Course-ID under the faculty</p> <p>c) view statistically analyzed GPA trend of students who faculty's section.</p>					
<p>Selective Number of Instructor-wise student performance based on the GPA</p>	<p>Admin:</p> <p>a) Logs into the system using User-ID and password.</p>		<p>Computer/ Laptop</p> <p>a) User will need a computer to access SPMS</p>	<p>SPMS</p> <p>a) a) The software will produce a performance trend for a specified instructor.</p>	<p>SPMS</p> <p>a) Here, the performance will be stored and updated.</p>	<p>Internet</p> <p>a) To login into and access the SPMS it is used.</p>

	<p>b) Inputs the desired time-period</p> <p>Course-ID</p> <p>c) View statistically analyzed GPA trend of students for a selective number of Instructors .</p> <p>Faculty:</p> <p>a) Logs into the system using Faculty-ID and password.</p>		<p>Printer</p> <p>a)Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a)Used to access the Internet.</p>			
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	b) Inputs the desired time - period & Course-ID c) View statistica y analyzed GPA trend of students for a selective number of Instructors . . GPA trend of students for a selective number of Instructors . .					
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Admin wise student performance	<p>Admin:</p> <ul style="list-style-type: none"> a) Logs into the system using User-ID and password. b) Select Input from from VC/Dean/ Department Head c) View the student performance trend as per choice. 	<p>Computer/ Laptop</p> <p>a)User will need a computer to access SPMS</p> <p>Printer</p> <p>a)Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a)Used to access the Internet.</p>	SPMS	<p>a) The software will produce a performance trend</p>	SPMS	<p>Database</p> <p>a) Here, the performance will be stored.</p>	Internet
Instructor-wise student	Admin:	<p>Computer/ Laptop</p>	SPMS	<p>a) The software will</p>	SPMS	<p>Database</p>	Internet

<p>performance based on the GPA of the students</p> <p>Department-I D and Password.</p> <p>b) Inputs a particular instructor Name/ID</p> <p>c) View the student performance trend of selected Instructor.</p> <p>Faculty:</p> <p>a) Logs into the system using User-ID and</p>	<p>a) Logs into the system using</p> <p>Printer</p> <p>a)Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a)Used to access the Internet.</p>	<p>a)User will need a computer to access SPMS</p>	<p>produce a performance trend</p>	<p>a) The performance will be stored and updated in the database.</p>	<p>access the SPM it is used.</p>
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	<p>password.</p> <p>b) Input their Name/ID.</p> <p>c) View the student performance trend.</p>					
Total PLO percentage achieved and attempted by the student along with the departmental average	<p>Student:</p> <p>a) Logs into the system using Student-ID and Password</p> <p>b) Inputs the time-period</p> <p>c) Views their comparison of attempted</p>	<p>Computer/ Laptop</p> <p>a)User will need a computer to access SPMS</p> <p>Printer</p> <p>a)Used to print out the report if need be.</p> <p>Networking Devices (Router,</p>	<p>Operating system</p> <p>a) Used by the SPMS</p> <p>SPMS</p> <p>a)A comparison of the attempted vs. achieved PLO as well as the departmental average will be produced by the software.</p>	<p>SPMS</p> <p>Database</p> <p>a) Here, the performance will be stored.</p>	<p>Internet</p> <p>a) To login into and access the SPM it is used.</p>	

	<p>vs achieved PLO percentage along with the departmental Average.</p> <p>Admin:</p> <ul style="list-style-type: none"> a) Logs into the system using User-ID and Password b) Inputs the time-period c) Views the comparison of students attempted PLO vs 		<p>Switch, Bridge, Hub):</p> <p>a)Used to access the Internet.</p>			
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	<p>achieved PLO percentage along with the departmental average.</p> <p>Faculty:</p> <p>a) Logs into the system using User-ID and Password.</p> <p>b) Inputs the time period.</p> <p>c) Views the comparison of students attempted</p>					
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	PLO vs achieved PLO percentage along with the departmental Average.					
PLO achievement	<p>Student:</p> <p>a) Logs into the system using Student-ID and password.</p> <p>b) Selects PLO achievement</p> <p>c) View PLO Achievement.</p>	<p>Computer/ Laptop</p> <p>a)User will need a computer to access SPMS</p> <p>Printer</p> <p>a)Used to print out the report if need be.</p> <p>Networking Devices</p>	<p>SPMS</p> <p>a) A PLO achievement will be generated by the software.</p>	<p>SPMS</p> <p>a) Here, the performance will be stored and updated.</p>	<p>Internet</p> <p>a) To login into and access the SPMS it is used.</p>	

	<p>Admin:</p> <p>a) Logs into the System using user-ID and password.</p> <p>b) Selects PLO achieveme nt</p> <p>c) View PLO Achievem ent.</p> <p>Faculty:</p> <p>a) Logs into the System using Faculty- ID and password.</p> <p>b) Selects</p>		(Router, Switch, Bridge, Hub): a)Used to access the Internet.			
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	PLO Achievement. c) View PLO Achievement.					
Expected PLO-achievement versus actual score (for course's, student's, Department's, program's or school's)	<p>Student:</p> <p>a) Logs into the system using Student-ID and password.</p> <p>b) Selects PLO achievement comparison</p> <p>c) View PLO achievement Comparison.</p>	<p>Computer/ Laptop</p> <p>a) User will need a computer to access SPMS</p> <p>Printer</p> <p>a) Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a) Used to</p>	<p>SPMS</p> <p>a) A) The software will calculate the expected vs. achieved PLO.</p>	<p>SPMS</p> <p>a) Database</p> <p>a) The performance will be stored and updated in the database.</p>	<p>SPMS</p> <p>a) To login into and access the SPMS it is used.</p>	<p>Internet</p>

	<p>Admin:</p> <p>a) Logs into the system using user-ID and password.</p> <p>b) Selects PLO achievement comparison.</p> <p>c) View PLO achievement Comparison.</p>		access the Internet.			
	<p>Faculty:</p> <p>a) Logs into the System using</p>					

	<p>Faculty-ID and password.</p> <p>b) Selects PLO achievement comparison.</p> <p>c) view PLO Achievement comparison.</p>					
CO-PLO achievement summary	<p>Student:</p> <p>a) Logs into the system using Student-ID and password.</p> <p>b) Selects CO -PLO</p>	<p>Computer/ Laptop</p> <p>a)User will need a computer to access SPMS</p> <p>Printer</p> <p>a)Used to print out the report if need be.</p>	<p>SPMS</p> <p>a)The software will produce a summary of CO-PLO accomplishments.</p>	<p>SPMS</p> <p>a)The Summary will be stored and updated in the database.</p>	<p>Internet</p> <p>a) To login into and access the SPMS it is used.</p>	

	<p>achievement summary.</p> <p>c) View CO- PLO achievement summary.</p> <p>Admin:</p> <p>a) Logs into the system using user-ID and password.</p> <p>b) Selects CO -PLO achievement summary.</p> <p>c) View CO - PLO achievement Summary.</p>		<p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a)Used to access the Internet.</p>			
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	<p>Faculty:</p> <p>a) Logs into the system using Faculty-ID and password.</p> <p>b) Selects CO -PLO achievement summary.</p> <p>c) View CO - PLO achievement Summary.</p>					
Question Bank	<p>Student:</p> <p>a) Logs into the system using</p>	Computer/ Laptop a)User will need a computer	SPMS a)The software will produce Question Bank	SPMS a) The Question Bank	Internet a) To login into and access the SPMS it is used.	

	<p>Student-ID and password.</p> <p>b) Selects Question Bank</p> <p>c) Views form</p> <p>d)Selects course, section and semester and assessmen t type.</p> <p>d)Downlo ads questions</p> <p> Faculty:</p> <p>a) Logs into the System using Faculty-ID and</p>		<p>to access SPMS</p> <p>Printer</p> <p>a)Used to print out the report if need be.</p> <p>Networkin g Devices (Router, Switch, Bridge, Hub):</p> <p>a)Used to access the Internet</p>		<p>will be stored and updated in the database</p>	
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	<p>password.</p> <p>b) Selects question bank</p> <p>c) Views form</p> <p>d)Selects course, section and semester and assessment type.</p> <p>e) Uploads questions</p>				
Course Outline	<p>Student:</p> <p>a) Logs into the system using Student-ID and password.</p> <p>b) Selects Course Outline</p>	<p>Computer/ Laptop</p> <p>a)User will need a computer to access SPMS</p> <p>Printer</p> <p>a)Used to print out</p>	<p>SPMS</p> <p>a)The software will generate course Outline</p>	<p>SPMS</p> <p>a)The Couse Outline will be stored and updated in the database</p>	<p>Internet</p> <p>a) To login into and access the SPMS it is used.</p>

	c) Views form d)Selects course, section and semester. d)Downloads course outline. Faculty: a) Logs into the System using Faculty-ID and password. b) Selects Course Outline c) Views form d)Selects course, section		the report if need be.			
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	and semester. e)Uploads course outline					
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PROCESS DIAGRAM (TO BE)

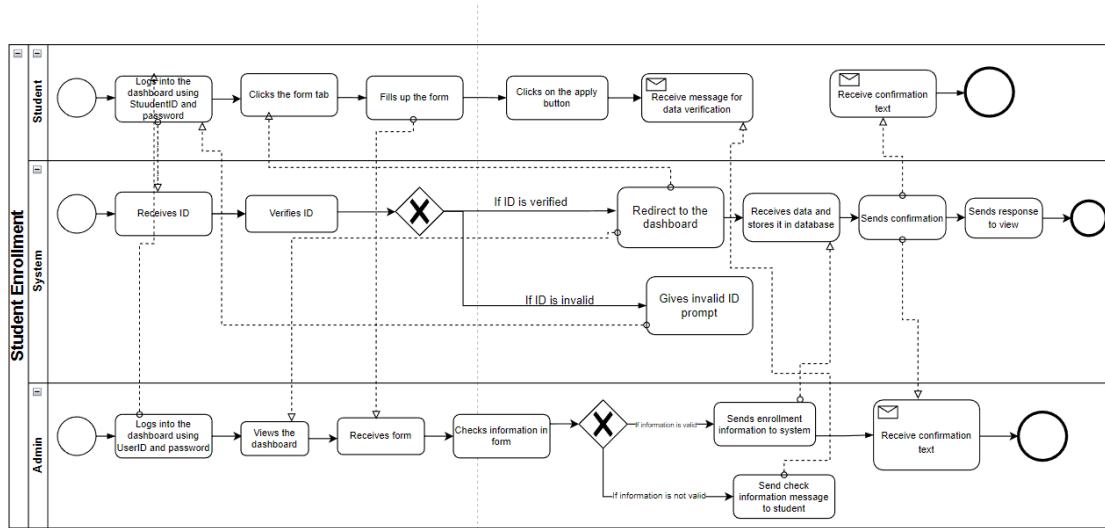


Figure 1.7: Student Enrollment

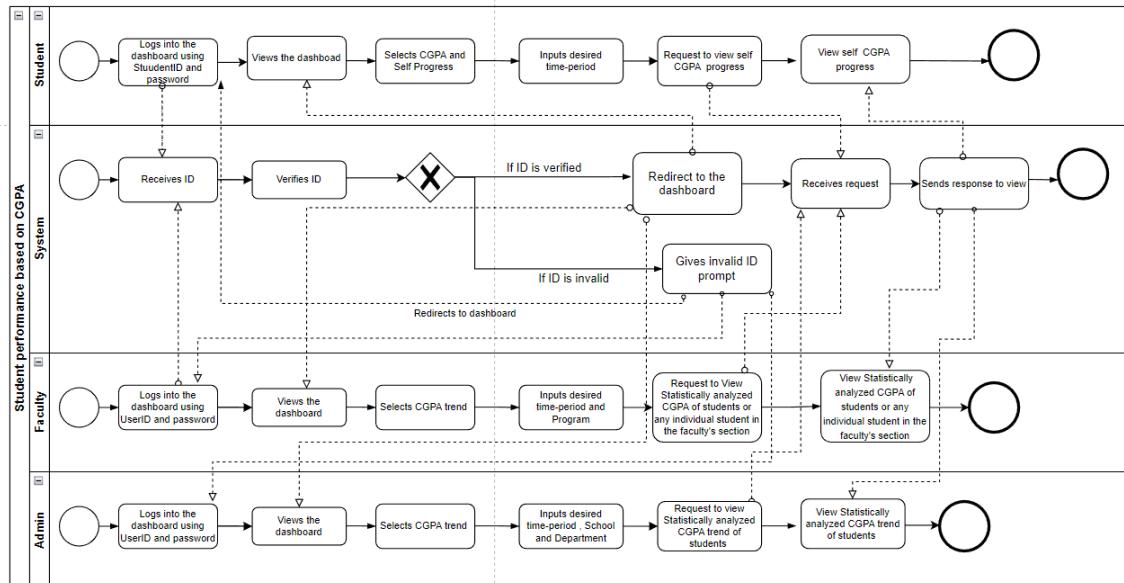


Figure 1.8: Student Performance based on CGPA

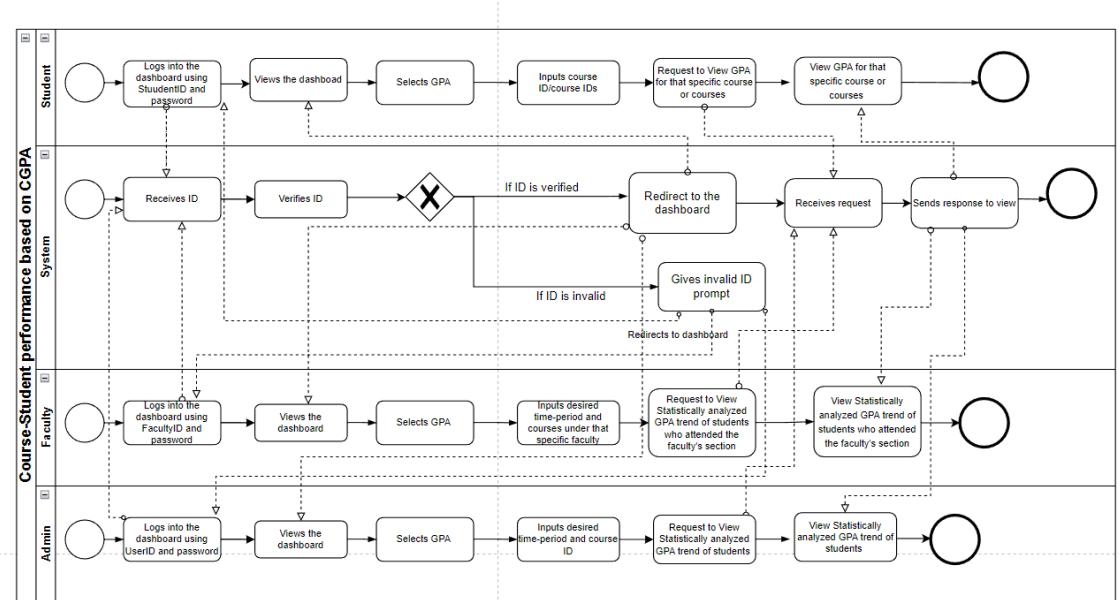


Fig 1.9:Course-Student performance based on CGPA

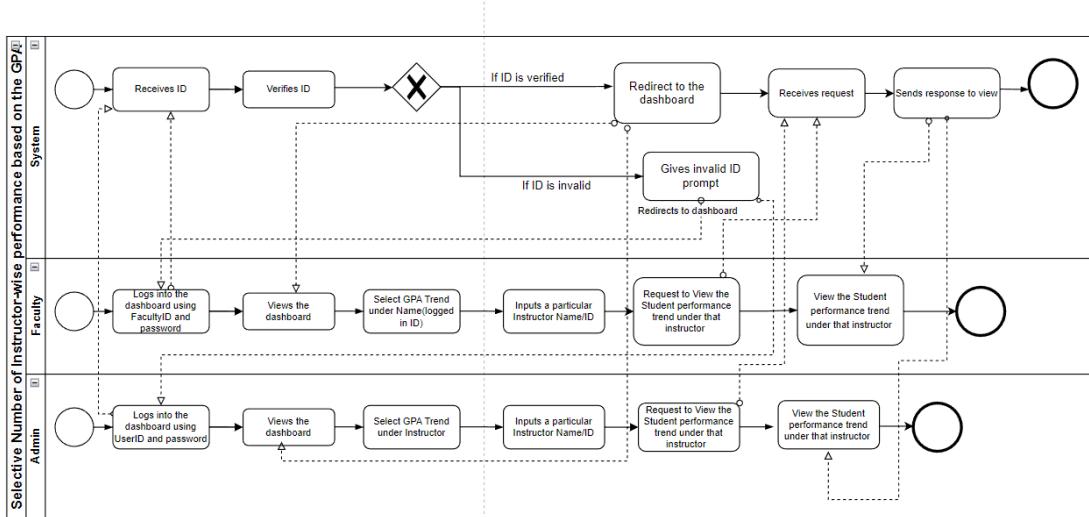


Figure 2.0: Selective Number of Instructor-wise performance based on the GPA

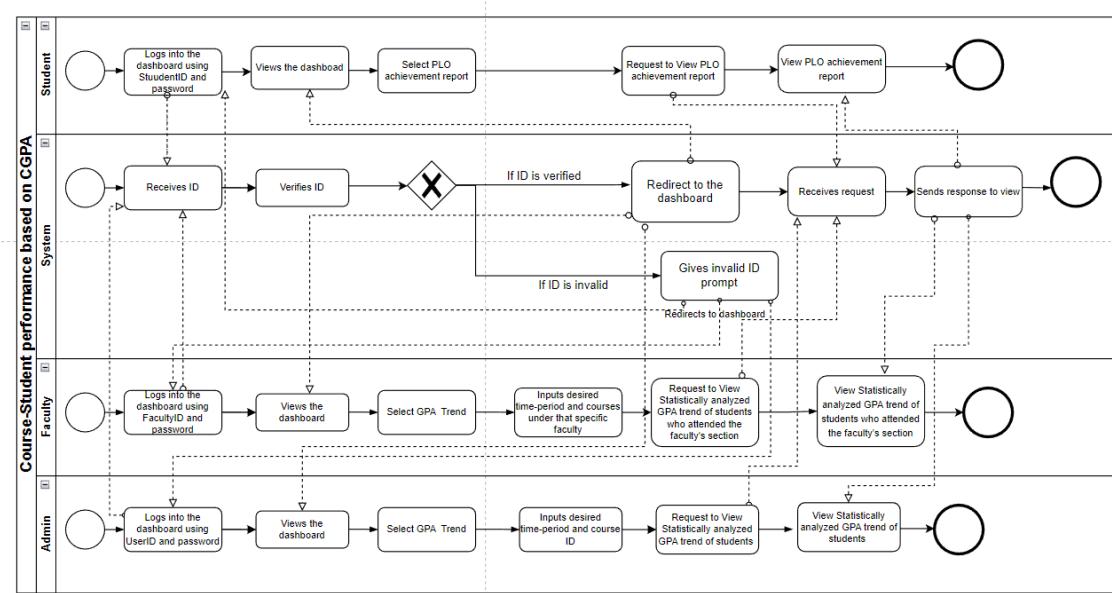


Figure 2.1: Course-wise Student Performance based on GPA

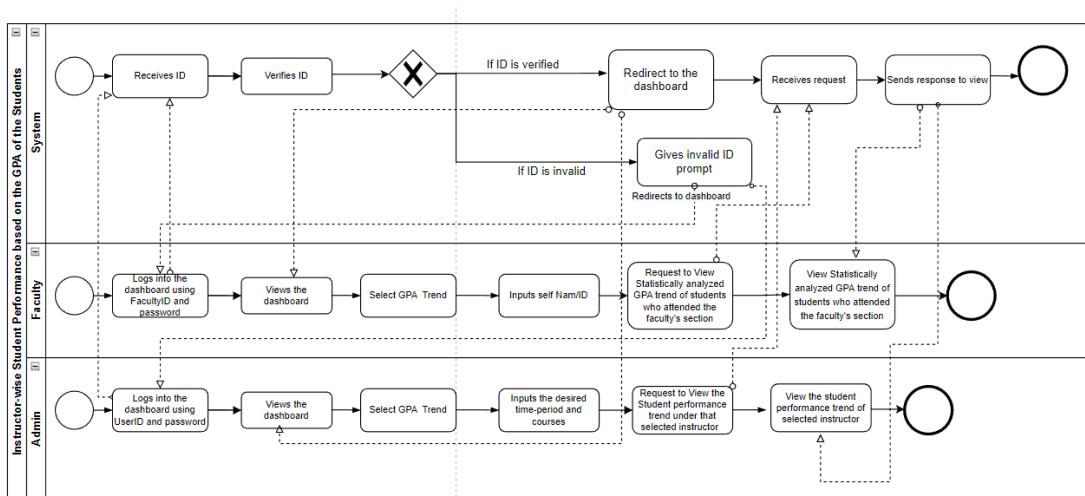


Figure 2.2: Instructor-wise Student Performance based on the GPA of the Students

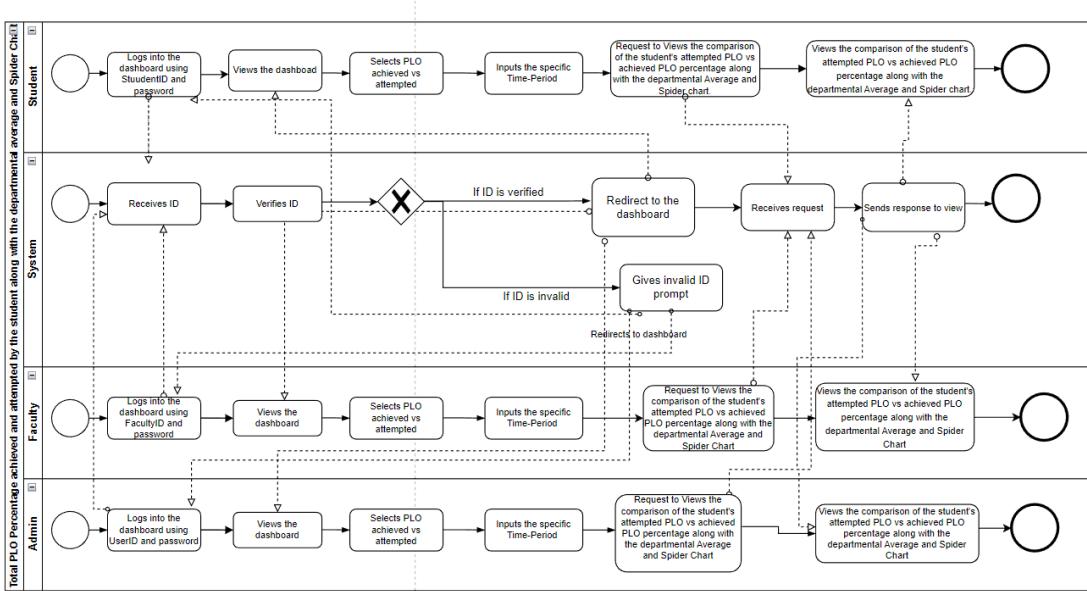


Figure 2.3: Total PLO Percentage achieved and attempted by the student along with the departmental average and Spider Chart

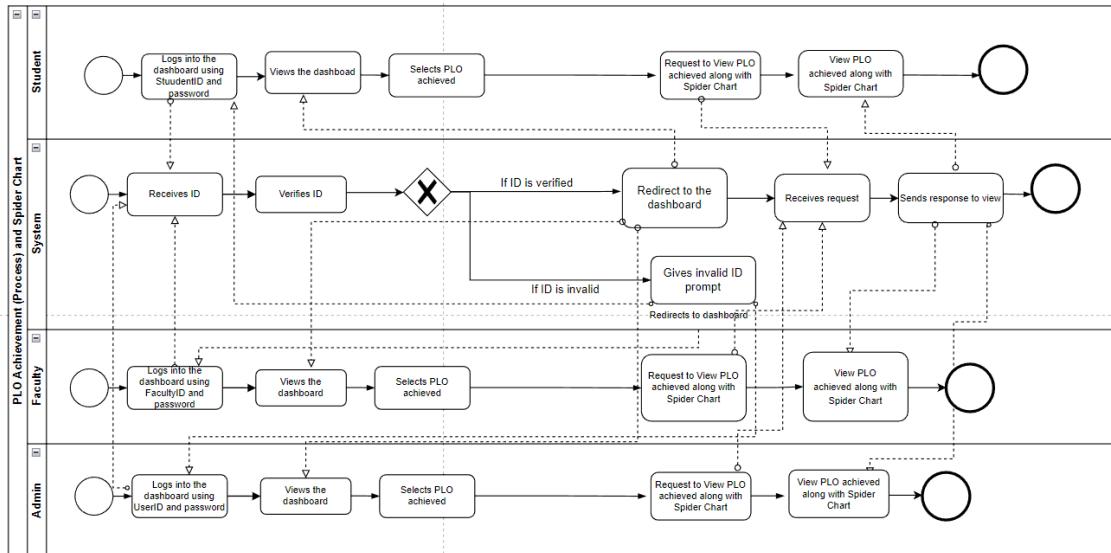


Figure 2.4: PLO Achievement (Process) and Spider Chart

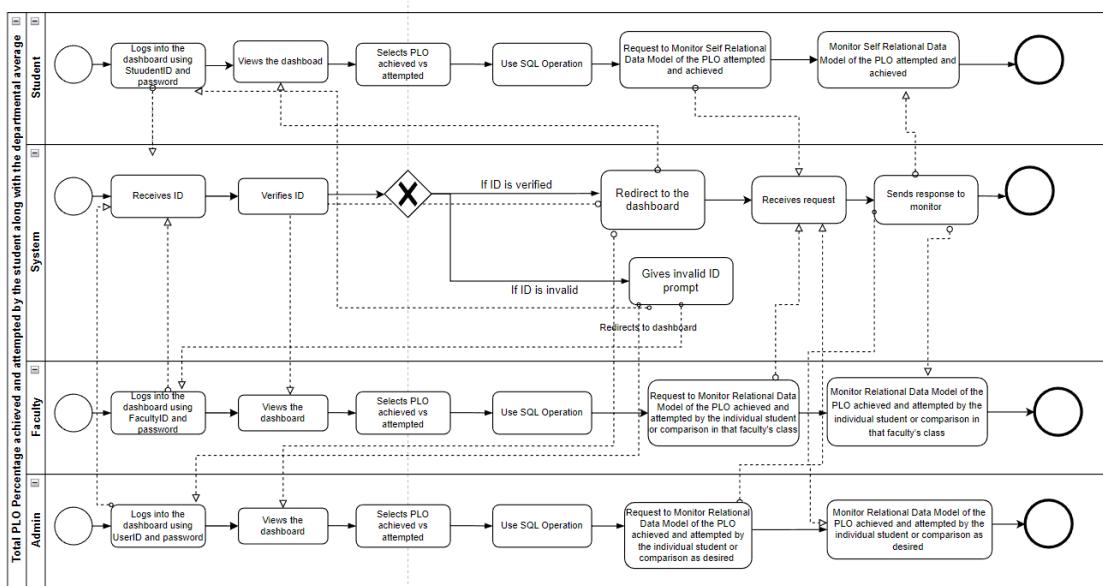


Figure 2.5: Comparison of PLO Achieved vs Attempted (Process)

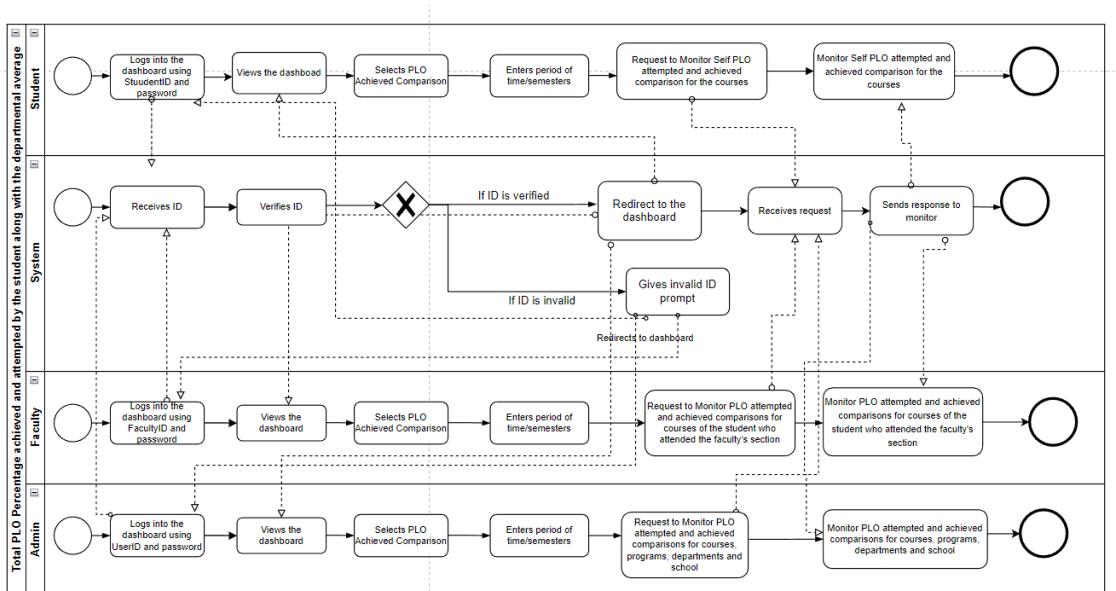


Figure 2.6: Expected PLO Achieved Vs Actual Score (Process)

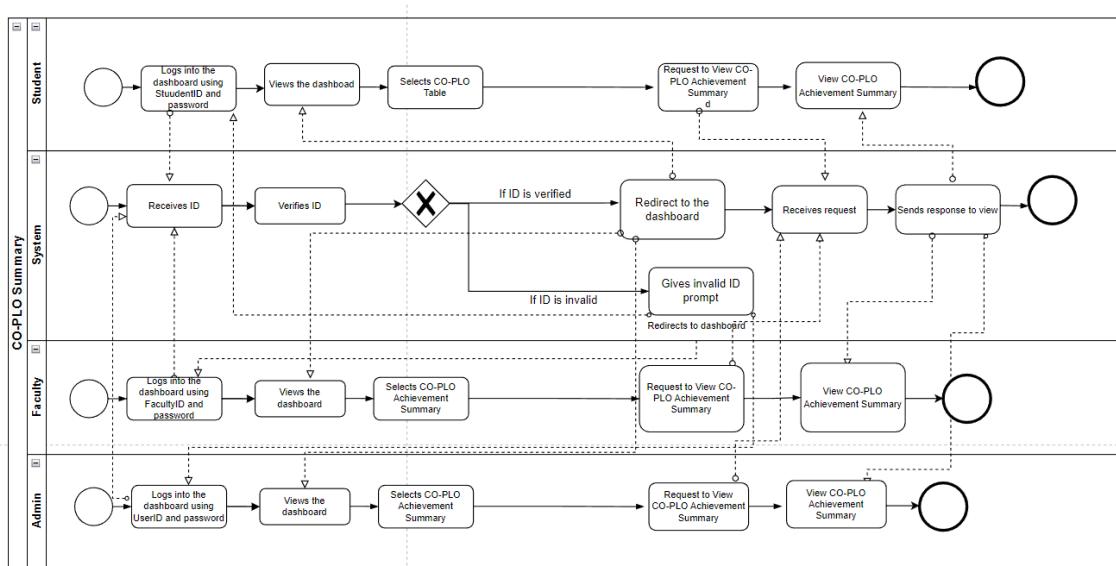


Figure 2.7: CO-PLO Summary (Process)

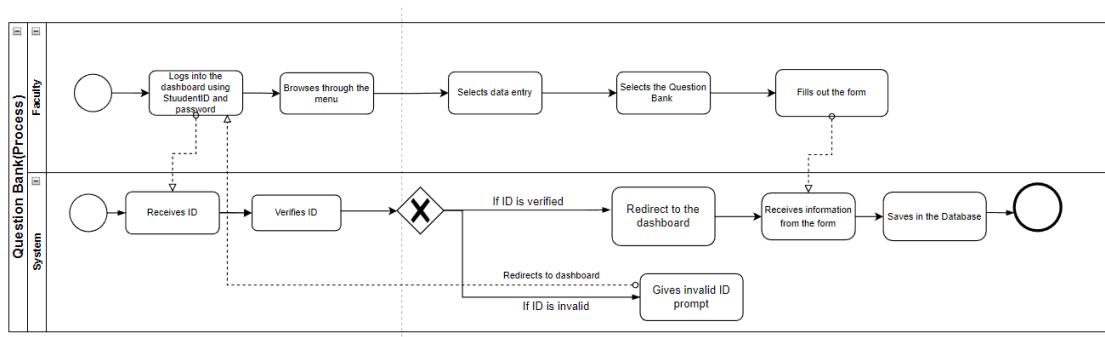


Figure 2.8: Question Bank (Process)

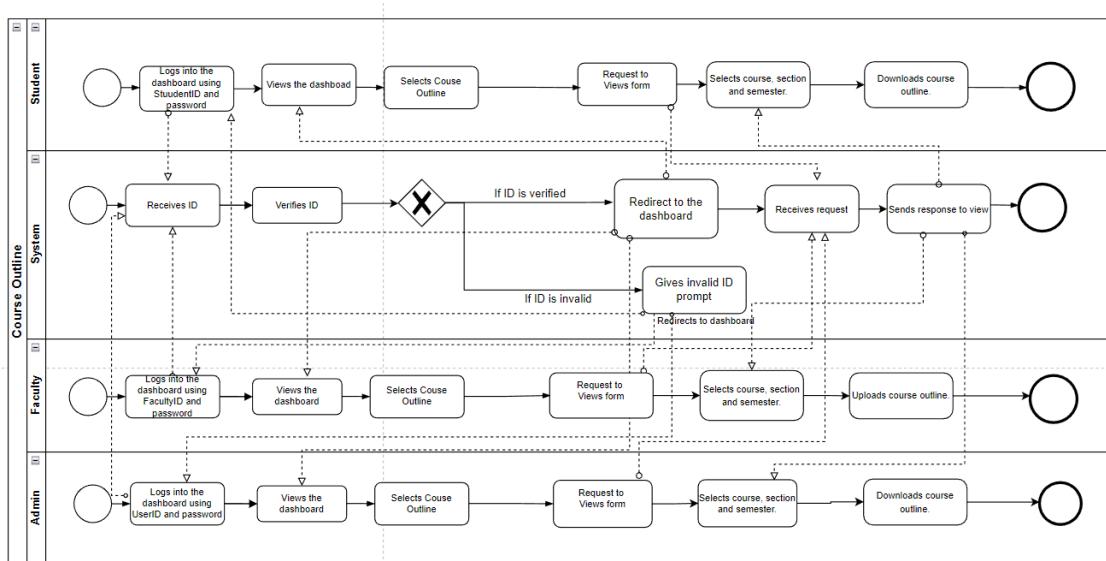


Figure 2.9: Course Outline

CH-3 LOGICAL SYSTEM DESIGN

BUSINESS RULES

Business rules describe the operations, definitions and constraints that govern the data model. As opposed to the ERD, they are made using regular English sentences so that a non-technical stakeholder can decipher information about the data model without notation knowledge.

The business rules that govern our data model are as follows:

1. A student must have one department. A STUDENT has StudentID, FirstName, LastName, DateofBirth, Gender, Email, Phone, Address, EnrollmentDate. A department must have many students.

2. Student may perform many registrations. A REGISTRATION includes RegistrationID, Semester, Year, Section Id, StutendID. A registration must be performed by at least one student.

3. A section mandatorily have many registrations. A registration has at least one section. A section includes SectionID, SectionNum, CourseId, FacultyID, Semester, Year.

4. A registration may belong to many EVALUATIONS. An evaluation mandatorily belongs to one registration. An evaluation contains EvaluationID, ObtainedMarks, AssessmentID, RegistrationID.

5. An evaluation must have one question. A question must have many evaluations. Question contains QuestionID, AssessmentName, TotalMarks. An question will have one section. A section contains one or many question.

6. Question must map with one CO's. A CO maps with one or many question. A

CO's includes COID, CourseID, PLOID. A CO must contain one Course. A Course contain one or many CO's. A course may have many prerequisites. A course must affiliate one mark distribution. A mark distribution may affiliate many courses. A Mark Distribution includes DistID, A, A-, B+, B, B-, C+, C, C-, D+, D, ThresoldMarks.

7. A CO's must map with one PLO's. A PLO's must map with one or many CO's. PLO includes PLOID, PLONum, Details, ProgramID.

8. A PLO must contain one program. A program contains one or many PLO's. A program has ProgramID, ProgramName, DepartmentID. A program must contain one or many courses. A Course must contain one course.

9. A program must belong to one department. A department must belong to one or many programs. A department contain DepartmentID, DepartmentName, SchoolID.

10. A department must contain one school. A School must contain one or many departments. A school includes SchoolID, SchoolName.

11. An employee has two sub-type (Admin and Faculty). An employee includes EmployeeID, FirstName, LastName, DateofBirth, Gender, Email, Phone, Address,

EmployeeType.An admin has EmployeeID, Rank, Join_Date, End_Date, Admin_Type.

12. A school must be run by one admin (Admin Type-Dean). A dean must run one school. A school has SchoolID, StartDate, EndDate.

13. A Department must manage one or many admin (Admin Type- Department head). A department head must manage one department.

14. A Faculty must have one Department. A department must have one or many Faculties.

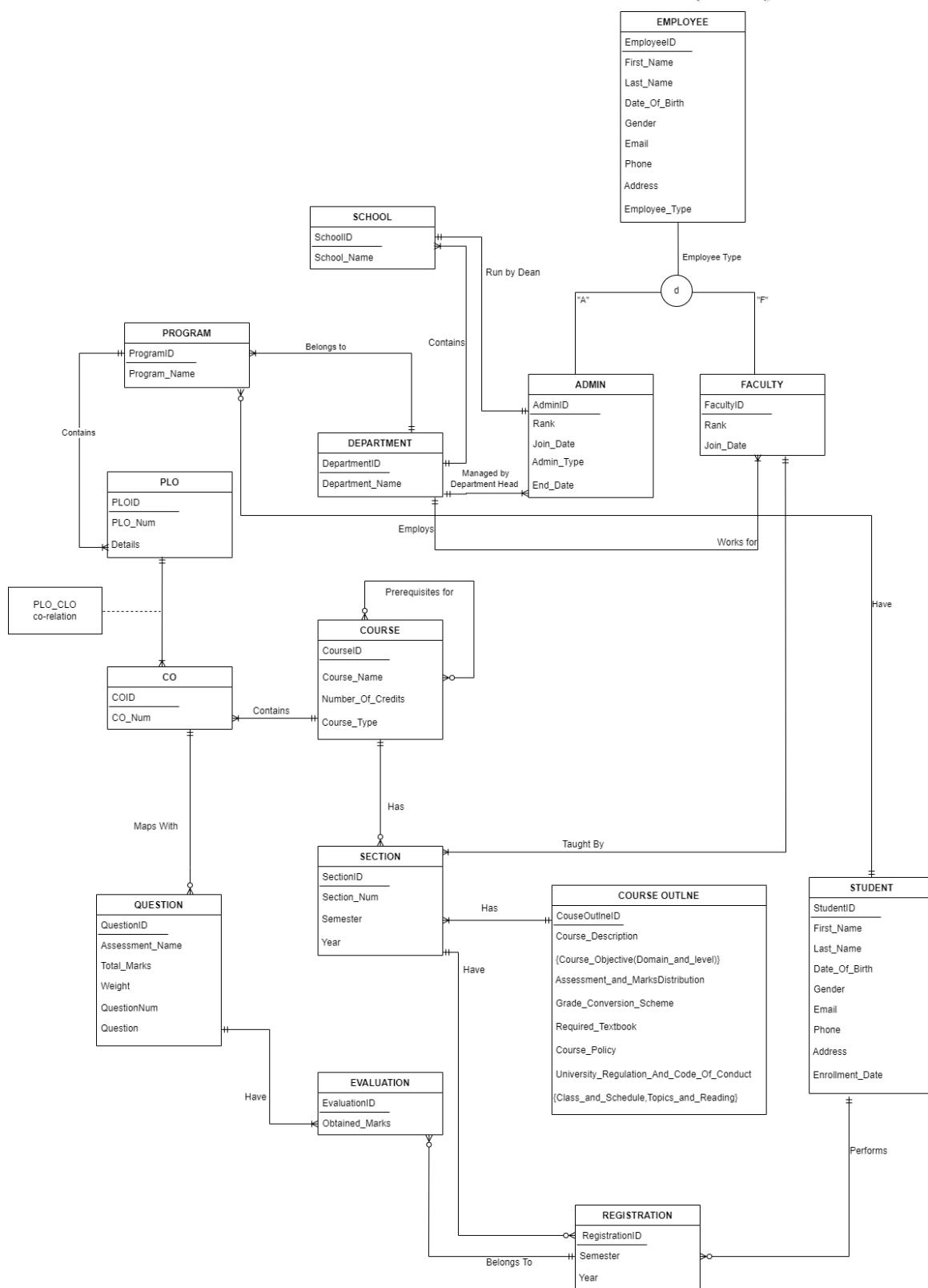
A

Faculty includes DepartmentID, Rank, JoinDate. A faculty may teach many sections. A section

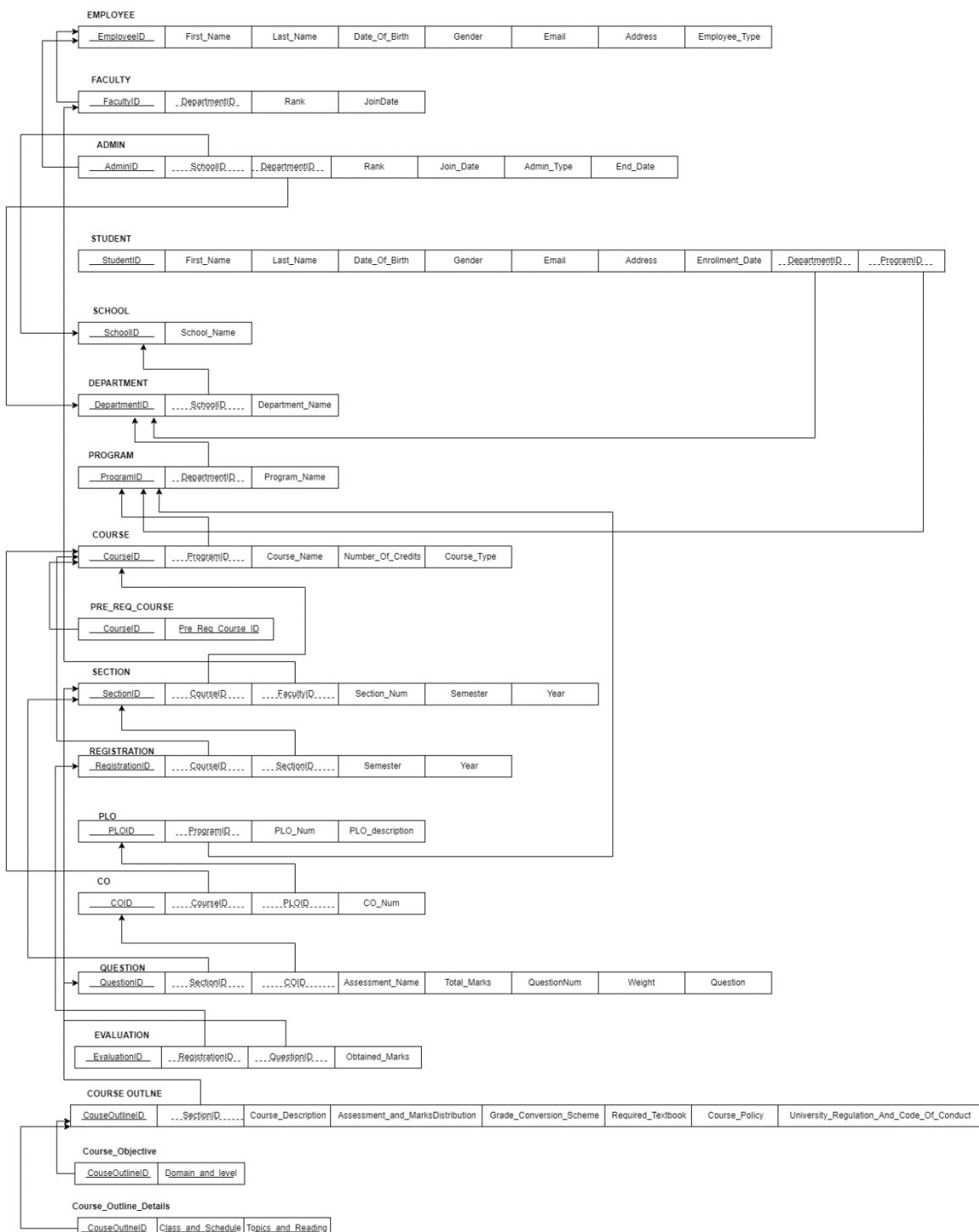
must be taught by one faculty.

15. One or many sections must have a course outline. A course outline contains CouseOutlineID, Section_Num, Course_Description, multiple course objectives which includes Domain_and_level and PLOs. It has multiple PLOs which includes PLO_number, PLO_description. It also contains Grade_Conversion_Scheme, Required_Textbook, Course_Policy, University_Regulation_And_Code_Of_Conduct and multiple values of Class_and_Schedule, Topics_and_Reading.

ENTITY RELATIONSHIP DIAGRAM (ERD)



ERD TO RELATIONS



NORMALIZATION

Employee	EmployeeID	a1
	FirstName	a2
	LastName	a3
	DateOfBirth	a4
	Gender	a5
	Email	a6
	Phone	a7
	Address	a8
	EmployeeType	a9
Faculty	FacultyID	b1
	DepartmentID	f1
	Rank	b2
	JoinDate	b3
Admin	AdEmployeeID	c1
	SchoolID	e1
	DepartmentID	f1
	Rank	c2
	JoinDate	c3
	AdminType	c4
	StudentID	d1
	FirstName	d2
	LastName	d3

Student	DateOfBirth	d4
	Gender	d5
	Email	d6
	Phone	d7
	Address	d8
	EnrollmentDate	d9
	ProgramID	g1
School	SchoolID	e1
	SchoolName	e2

1NF: A relation that has a primary key and in which there are no repeating groups.

1NF

a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	c1	c2	c3	c4	c5
d1	d2	d3	d4	d5	d6	d7	d8	e1	e2	f1	f2	g1	g2	h1
h2	h3	h4	h5	i1	i2	i3	i4	j1	j2	j3	k1	k2	k3	l1
l2	l3	m1	m2	m3	m4	m5	m6	n1	n2	o1	o2	o3	o4	o5
o6	o7	o8	o9	o10										

2NF: A relation in first normal form in which every non-key attribute is fully functionally dependent on the primary key.

2NF

a1	a2	a3	a4	a5	a6	a7
----	----	----	----	----	----	----

b1	b2	b3	e1	e2	f1	f2	g1	g2	h1	h2	h3	h4	h5
i1	i2	i3	i4	j1	j2	j3	k1	k2	k3	l1	l2	l3	m1
m2	m3	m4	m5	m6	n1	n2							

c1	c2	c3	c4	c5				
----	----	----	----	----	--	--	--	--

d1	d2	d3	d4	d5	d6	d7	d8	
----	----	----	----	----	----	----	----	--

o1	o2	o3	o4	o5	o6	o7	o8	o9	o10
----	----	----	----	----	----	----	----	----	-----

3NF: A relation that is in second normal form and has no transitive dependencies.

3NF

a1	a2	a3	a4	a5	a6	a7
----	----	----	----	----	----	----

o1	o2	o3	o4	o5	o6	o7	o8	o9	o10
----	----	----	----	----	----	----	----	----	-----

c1	c2	c3	c4	c5				
----	----	----	----	----	--	--	--	--

b1	b2	b3	e1	e2	f1	f2	g1	g2	h1	h2	h3	h4	h5
i1	i2	i3	i4	j1	j2	j3	k1	k2	k3	l1	l2	l3	m1
m2	m3	m4	m5	m6	n1	n2							

n1	j1	m1	n2
----	----	----	----

→ m1	j1	i1	m2	m3	m4	m5	m6
------	----	----	----	----	----	----	----

→ i1	h1	k1	i2	i3
------	----	----	----	----

j1	h1	a1	j2	j3
----	----	----	----	----

→ h1	g1	h2	h3	h4	h5
------	----	----	----	----	----

→ g1	g2	f1	
------	----	----	--

f1	f2	a1	
----	----	----	--

→ e1	e2		
------	----	--	--

DATA DICTIONARY

School_T

Name	Data Type	Size	Remarks
cSchoolID	VARCHAR	5	This is the primary key of School. E.g.: "SETS"
cSchoolName	VARCHAR	50	This is the name of the school. E.g.: "School of Engineering, Technology & Science".

Program_T

Name	Data Type	Size	Remarks
cProgramID	INTEGER		This is the primary key for a program. E.g.: "1"
cProgramName	VARCHAR	50	This is the name of the program. E.g.: "Bachelor of Science"

cDepartmentID	VARCHAR	3	This is the foreign key from the Department table. E.g.: “CSE”
---------------	---------	---	-------------------------------------------------------------------

Department_T

Name	Data Type	Size	Remarks
cDepartmentID	VARCHAR	3	This is the primary key for the Department table. E.g.: “CSE”
cDepartmentName	VARCHAR	50	This is the name of the department. E.g.: “Computer Science and Engineering”.
cSchoolID	VARCHAR	5	This is a foreign key from the school table. E.g.: “SETS”.

CLO_T

Name	Data Type	Size	Remarks
nCLOID	INTEGER		This is the primary key for the CLO table. E.g.: “1”.

cCLONum	TEXT		E.g.: “CLO1”.
nThreshold	Integer		It is the minimum marks needed to pass E.g., “40”
cPLOID	INT		This is the foreign key from the Program Learning Outcome table. E.g.: “PLO1”
cCourseID	VARCHAR	6	This is the Foreign Key from the Course table. E.g.: “CSE203”

PLO_T

Name	Datatype	Size	Remarks
cPLOID	VARCHAR	5	This is the primary key for Program Learning Outcome. E.g.: “PLO1”
nPLONum	INTEGER		This is the PLO number. E.g.: “1”
cDetails	VARCHAR	50	This is the details for Program Learning Outcome. E.g.: “An ability to select and apply the knowledge, technique, skills and modern tools of the computer science and engineering discipline”
cProgramID	INTEGER		This is the foreign key from the program table. E.g.: “1”

Evaluation_T

Name	Datatype	Size	Remarks
nEvaluationID	INTEGER		This is the Primary Key for Enrollment.
cObtainedMarks	NUMBER		This is the obtained marks of the student. E.g.: “24.5”
cQuestionID	INTEGER		This is the foreign key from the assessment table.
nRegistrationID	INTEGER		This is the Foreign Key from Registration table.

Student_T

Name	Data Type	Size	Remarks
nStudentID	INTEGER		This is the primary key for the student table. E.g.: “1921834”.
cFirstName	VARCHAR	30	This is the first name of the student. E.g.: “Rakibul”.
cLastName	VARCHAR	30	This is the last name of the student. E.g.: “Hasan”.
dDateOfBirth	DATE	DD MM YYYY	This is the birth date of the student. E.g.: “21-12-1996”.
cGender	VARCHAR	6	This is the gender of the student. E.g.: “Female”.

cEmail	VARCHAR	30	This is the email of the student. E.g.: “1921834@iub.edu.bd”
nPhone	NUMERIC	11	This is the phone of the student. E.g.: “01XXXXXXXXX”.
cAddress	VARCHAR	50	This is the address of the student. E.g.: “House 1, Road 4, Block D, Bashundhara RA”.
dEnrollmentDate	DATE	DD MM YYYY	This is enrollment date of the student. E.g.: “1-1-2019”
cProgramID	INTEGER		This is the foreign key from the program table. E.g.: “1”
cDepartmentID	VARCHAR	3	This is the foreign key from the Department table. E.g.: “CSE”

Employee_T

Name	Datatype	Size	Remarks
nEmployeeID	INTEGER		This is the primary key for Employee table. E.g.: “1801”
cFirstName	VARCHAR	30	This is the first name of the faculty. E.g.: “Sadita”
cLastName	VARCHAR	30	This is the last name of the faculty. E.g.: “Ahmed”

dDateofbirth	DATE	DD-MM YYYY	This is the date of Birth of the faculty. E.g.:01-01-1992
cGender	VARCHAR	6	This is the gender of the faculty. E.g.: “Female”
cEmail	VARCHAR	30	This is the email address of the student. E.g.: “1675231@iub.edu.bd”
nPhone	NUMERIC	11	This is the phone number of the faculty. E.g.: “01292383111”
cAddress	VARCHAR	30	This is the address of the faculty. E.g.: “House 14, Road 21, Sector 11, Baridara,Dhaka, Bangladesh”
cEmployeeType	CHAR	1	This is the type of the employee. E.g.: “F”

Course_T

Name	Datatype	Size	Remarks
cCourseID	VARCHAR	6	This is the Primary Key for the Course. E.g.: “CSE203”
cCourseName	VARCHAR	40	This is the name of the Course. E.g.: “Discreet Mathematics”
nNumOfCredits	INTEGER		This is the number of credits for the Course. E.g.: “3”

cCourseType	VARCHAR	10	This is the type of the Course. E.g.: “Core”
cPLOID	INTEGER		This is the foreign key from the Program Learning Outcome table. E.g.: “PLO1”

Section_T

Name	Datatype	Size	Remarks
nSectionID	INTEGER		This is the Primary Key for Section. E.g.: “1”
nSectionNum	INTEGER		This is the section number. E.g.: “1”
cCourseID	VARCHAR	6	This is the foreign key from the Course table. E.g.: “CSE101”
cSemester	VARCHAR	6	This is the semester of the section. E.g.: “Summer”
cFacultyID	NUMERIC	4	This is the foreign key from Faculty table. E.g.: “1801”
dYear	YEAR	yyyy	This is the year of registration. E.g.: “2019”

Registration_T

Name	Datatype	Size	Remarks
nRegistrationID	INTEGER		This is the Primary Key for Registration. E.g.: “0101010101”
cSemester	VARCHAR	6	This is the semester of registration. E.g.: “Spring”
dYear	YEAR	yyyy	This is the year of registration. E.g.: “2019”

Question_T

Name	Datatype	Size	Remarks
nQuestionID	INTEGER		This is the Primary Key for Assessment.
cAssessmentName	VARCHAR	30	This is the name of the assessment. E.g.: “Mid”
cTotalMarks	NUMBER		This is the total marks of the assessment. E.g.: “30”
cQuestion	VARCHAR		This is the question for the assessment. E.g.: “What is SQL”
nQuestionNum	INTEGER		This is the question number E.g.: “1,2,3....”

nWeight	INTEGER		This is the percentage range for assessment. E.g.: “Project- 50%, Assessment-50%”.
nSectionID	INTEGER		This is the Foreign Key from Section table.
nCOID	INTEGER		This is the Foreign Key from the Course Outcome table.

Faculty_T

Name	Datatype	Size	Remarks
nFacultyID	INTEGER		This is the primary key for the faculty table. E.g.: “4250”
dJoinDate	DATE	dd-mm yyyy	This is starting date. E.g.: “01-03-2020”
cRank	VARCHAR	30	This is the rank of the faculty. E.g.: “Assistant Professor”
cDepartmentID	VARCHAR	3	This is the foreign key from the Department table. E.g.: “CSE”

Admin_T

Name	Datatype	Size	Remarks
nAdminID	INTEGER		This is the primary key for the admin table. E.g.: “4250”
cAdminType	VARCHAR	30	This is the type of user logging in E.g.: “VC”
dJoinDate	DATE	dd-mm-yyyy	This is starting date. E.g.: “01-03-2020”
cRank	VARCHAR	30	This is the rank of the admin. E.g.: “Assistant Professor”
dEndDate	DATE	dd-mm-yyyy	This is the date the admin retires from his post. E.g.: “01-03-2024”
cDepartmentID	VARCHAR	3	This is the foreign key from the Department table. E.g.: “CSE”
cSchoolID	VARCHAR	5	This is a foreign key from the school table. E.g.: “SETS”.

Course_Outline_T

Name	Datatype	Size	Remarks
nCourseOutlineID	INTEGER		This is the Primary Key for Course Outline.

cCourseDescription	TEXT		This is the description of the course E.g.: "Basic concepts of DBMS."
cAssessmentAndMarksDistribution	TEXT		This is the total marks distribution of the course. E.g.: "Final-100"
cGradeConversionScheme	TEXT		This is the breakdown of which grade carries which score E.g.: "A-4.00"
cRequiredTextbook	TEXT		This is the list of the books required for the course E.g.: "Modern Database Management by Jeffrey A. Hoffer, Mary B. Prescott, Fred R. Mcfadden."
cCoursePolicy	TEXT		These are the policies of a course E.g.: "No working mobile phones are allowed in class."
cUniversityRegulationAndCodeOfConduct	TEXT		These are the rules given by the university that must be maintained. E.g.," Please see the Green Book for further information"
nSectionID	INTEGER		This is the Foreign Key from Section table.

CH-4 PHYSICAL SYSTEM DESIGN

INPUT FORMS



```

def home(request):
    user_id=queries.getCurrUser()[0][0]
    user_dept=queries.getDept(user_id)
    context={
        "page": "dashboard",
        "id": user_id,
        "group": queries.getCurrUser()[0][1],
        "name": queries.getName(str(queries.getCurrUser()[0][0])),
        "department": queries.getDept(queries.getCurrUser()[0][0]),
        "PLOAchievement": PloAchieve(user_id),
        "COAchievement": OneTraceSpider(queries.getStudentWiseCLO(user_id)[1], queries.getStudentWiseCLO(user_id)[0]),
        "PLOAchievePercent": OneTraceSpider(queries.getStudentWisePLO(user_id)[1], queries.getStudentWisePLO(user_id)[0]),
        "GPAAAnalysis": TwoTraceLineChart(queries.getStudentSemesterWiseGPA(user_id)[0], queries.getStudentSemesterWiseGPA(user_id)[1], queries.getDeptSemesterWiseGPA(user_dept)[1]),
        "PLOComparison": PloCompare(user_id)
    }

    return render(request, "Student/sHome.html", context)

def authenticate(request):
    userID=request.POST.get("userid")
    password=request.POST.get("password")
    if queries.isValid(userID)==True:
        passwords = queries.getPassword(userID)
        if passwords==password:
            queries.setCurrUser(userID)
            return home(request)
        else:
            return HttpResponse("error")
    else:
        return HttpResponse("error")

def login(request):
    return render(request, "login.html")

```

OUTPUT QUERY & REPORTS

```
def home(request):
    user_id=queries.getCurrUser()[0][0]
    user_dept=queries.getDept(user_id)
    context={
        "page":"dashboard",
        "id":user_id,
        "group":queries.getCurrUser()[0][1],
        "name":queries.getName(str(queries.getCurrUser()[0][0])),
        "PLOAchievement":PloAchieve(user_id),
        "COAchievement":OneTraceSpider(queries.getStudentWiseCLO(user_id)[1],queries.getStudentWiseCLO(user_id)[0]),
        "PLOAchievePercent":OneTraceSpider(queries.getStudentWisePLO(user_id)[1],queries.getStudentWisePLO(user_id)[0]),
        "GPAAnalysis":TwoTraceLineChart(queries.getStudentSemesterWiseGPA(user_id)[0],queries.getStudentSemesterWiseGPA(user_id)[1]),
        "PLOComparison":PloCompare(user_id)
    }
```



```
def getStudentWisePLO(student_id):
    cursor = mydb.cursor()
    cursor.execute('''
        SELECT p.plo_num as plo_num,100*(sum( e.obtained_marks)/sum( a.total_marks)) as plopercent
        FROM spms_registration_t r,
        spms_question_t a,
        spms_evaluation_t e,
        spms_clo_t co,
        spms_plo_t p
        WHERE r.registration_id = e.registration_id
        and e.question_id = a.question_id
        and a.clo_id=co.clo_id
        and co.plo_id = p.plo_id
        and r.student_id = '{}'
        GROUP BY p.plo_id
        '''.format(student_id))
    row = cursor.fetchall()
    cursor.close()

    PLO=[[[]for i in range(2)]
    for i in range(len(row)):]
    PLO[0].append(row[0][0])
    PLO[1].append(row[0][1])
    return PLO
```



```
#CLO Analysis
def getStudentWiseCLO(student_id):
    cursor = mydb.cursor()
    cursor.execute('''
        SELECT co.clo_num as clo_num, 100*(sum( e.obtained_marks)/sum( a.total_marks)) as clopercent
        FROM spms_registration_t r,
        spms_question_t a,
        spms_evaluation_t e,
        spms_clo_t co
        WHERE r.registration_id = e.registration_id
        and e.question_id = a.question_id
        and a.clo_id=co.clo_id
        and r.student_id = '{}'
        GROUP BY co.clo_num
    '''.format(student_id))
    row = cursor.fetchall()
    cursor.close()

    CLO=[[[]for i in range(2)]
    for i in range(len(row))]:
        CLO[0].append(row[i][0])
        CLO[1].append(row[i][1])
    return CLO
```



```

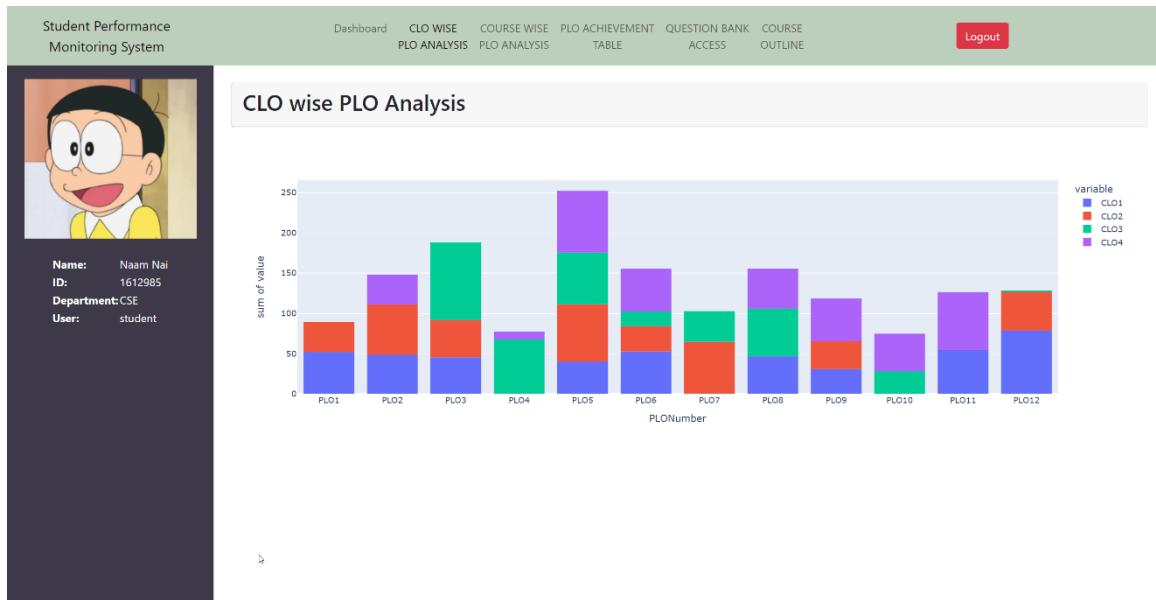
def getStudentSemesterWiseGPA(student_id):
    cursor = mydb.cursor()
    cursor.execute('''
        SELECT Semester,sum(Credits*grade)/sum(Credits)
        FROM(
            SELECT Semester,Credits, CourseID,
            CASE
                WHEN sum(Marks) >= 85 THEN 4.0
                WHEN sum(Marks) >= 80 AND sum(Marks)<85 THEN 3.7
                WHEN sum(Marks) >= 75 AND sum(Marks)<80 THEN 3.3
                WHEN sum(Marks) >= 70 AND sum(Marks)<75 THEN 3.0
                WHEN sum(Marks) >= 65 AND sum(Marks)<70 THEN 2.7
                WHEN sum(Marks) >= 60 AND sum(Marks)<65 THEN 2.3
                WHEN sum(Marks) >= 55 AND sum(Marks)<60 THEN 2.0
                WHEN sum(Marks) >= 50 AND sum(Marks)<55 THEN 1.7
                WHEN sum(Marks) >= 45 AND sum(Marks)<50 THEN 1.3
                WHEN sum(Marks) >= 40 AND sum(Marks)<45 THEN 1.0
                ELSE 0.0
            END as grade
        FROM(
            SELECT r.semester as Semester,c.course_id as CourseID,a.weight*(sum(e.obtained_marks))/sum(a
            FROM spms_registration_t r,
            spms_section_t sc,
            spms_course_t c,
            spms_question_t a,
            spms_evaluation_t e
            WHERE r.section_id = sc.section_id
            and c.course_id = sc.course_id
            and r.registration_id = e.registration_id
            and a.question_id = e.question_id
            and r.student_id = '{}'
            GROUP BY c.course_id,a.assessment_name) Derived
    '''.format(student_id))
    row=cursor.fetchall()
    semestergpa=[[]for i in range(2)]
    for i in range(len(row)):
        semestergpa[0].append(row[i][0])
        semestergpa[1].append(row[i][1])
    return semestergpa

```

```

def CoPloAnal(request):
    # queries.getStudentCourseWiseCO(queries.getCurrUser()[0][0],"CSE101")
    context={
        "page":"coplo",
        "id":queries.getCurrUser()[0][0],
        "group":queries.getCurrUser()[0][1],
        "name":queries.getName(str(queries.getCurrUser()[0][0])),
    }
    return render(request,"Student/co-plo-analysis.html",context)

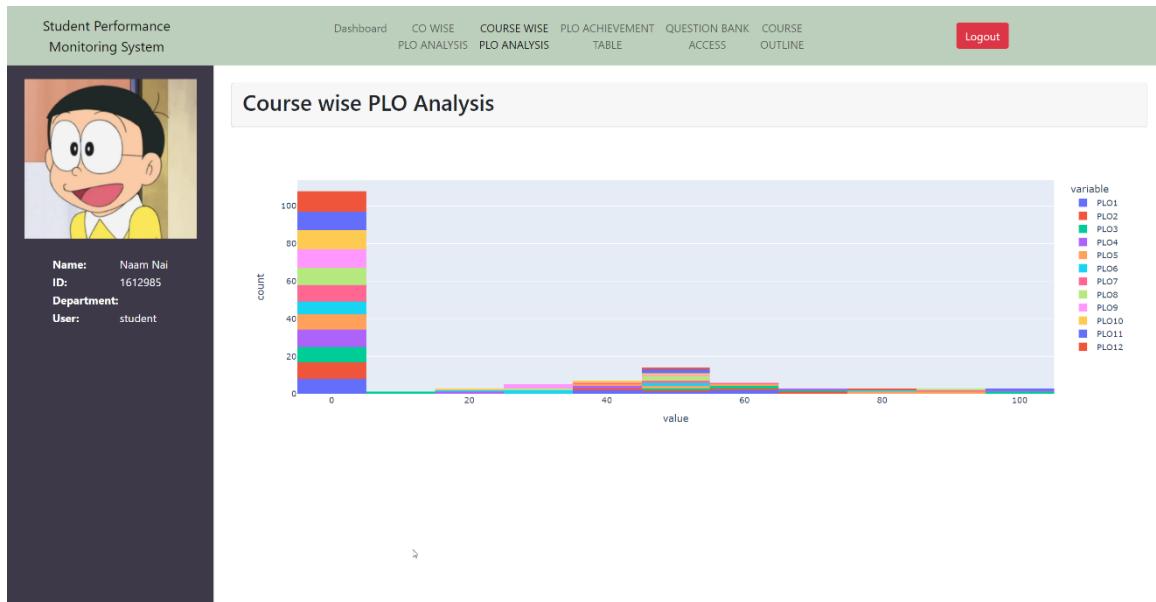
```



```
def getStudentCourseWiseCO(user_id, courseid):
    cursor = mydb.cursor()
    cursor.execute('''
        SELECT coNum, (100*(sum( e.obtained_marks)/sum( a.total_marks))) as copercent
        FROM spms_registration_t r,
             spms_question_t a,
             spms_evaluation_t e,
             spms_clo_t clo,
             spms_plo_t p
        WHERE r.registration_id = e.registration_id
            and e.question_id = a.question_id
            and a.clo_id=clo.clo_id
            and clo.plo_id = p.plo_id
            and r.student_id = {}
            and clo.course_id="{}"
        GROUP BY clo.clo_id''.format(user_id, courseid))
    rows=cursor.fetchall()
    cursor.close()
    CO=[[[]for i in range(2)]
        for i in range(len(rows))]
    for i in range(len(rows)):
        CO[0].append(rows[i][0])
        CO[1].append(rows[i][1])

    return CO
```

```
def coursePloAnal(request):
    context={
        "page": "course",
        "id": queries.getCurrUser()[0][0],
        "group": queries.getCurrUser()[0][1],
        "name": queries.getName(str(queries.getCurrUser()[0][0])),
    }
    return render(request, "Student\course-plo-analysis.html", context)
```



Student Performance Monitoring System

Dashboard CO WISE COURSE WISE PLO ACHIEVEMENT TABLE QUESTION BANK COURSE OUTLINE Logout

PLO Achievement Table

Name: Naam Nai
ID: 1612985
Department: CSE
User: student

Courses	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
CSE101	60.00	36.67	60.00	36.00	N/A							
CSE104	N/A	N/A	N/A	40.00	31.43	38.00	50.00	N/A	N/A	N/A	N/A	N/A
CSE101	N/A	N/A	N/A	N/A	51.43	50.91	N/A	28.00	N/A	N/A	46.67	N/A
CSE103	N/A	N/A	N/A	N/A	76.67	N/A	62.56	N/A	30.91	18.00	N/A	N/A
CSE104	N/A	N/A	45.45	N/A	N/A	N/A	90.00	53.33	N/A	N/A	48.57	N/A
CSE210	37.14	3.33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	54.55	2.00
CSE211	N/A	N/A	96.00	20.00	91.43	N/A	N/A	N/A	N/A	N/A	N/A	79.79
CSE213	N/A	70.00	N/A	66.00	N/A	N/A	N/A	46.67	34.29	N/A	N/A	N/A
CSE214	N/A	N/A	N/A	N/A	64.00	54.55	85.71	N/A	N/A	46.67	N/A	N/A
CSE216	42.03	N/A	11.43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	96.67	0.00
CSE303	N/A	48.48	68.57	100.00	N/A	80.00	N/A	N/A	N/A	N/A	N/A	N/A
CSE307	45.45	62.95	N/A	N/A	N/A	26.67	N/A	N/A	N/A	39.00	N/A	N/A
CSE309	60.00	N/A	N/A	0.00	N/A	18.00	45.71	N/A	N/A	N/A	N/A	N/A

```
def getCourseWiseStudentPLO(student_id, cat):
    cursor = mydb.cursor()
    cursor.execute('''
        SELECT p.plo_num as plo_num, co.course_id, sum(e.obtained_marks), sum(a.total_marks), derived.Total
        FROM spms_registration_t r,
             spms_question_t a,
             spms_evaluation_t e,
             spms_clo_t co,
             spms_plo_t p,
        (
            SELECT p.plo_num as plo_num, sum(a.total_marks) as Total, r.student_id as student_id
            FROM spms_registration_t r,
                 spms_question_t a,
                 spms_evaluation_t e,
                 spms_clo_t co,
                 spms_plo_t p
            WHERE r.registration_id = e.registration_id
            and e.question_id = a.question_id
            and a.clo_id=co.clo_id
            and co.plo_id = p.plo_id
            and r.student_id = '{}'
            GROUP BY r.student_id,p.plo_id) derived
        WHERE r.student_id = derived.student_id
            and e.registration_id = r.registration_id
            and e.question_id = a.question_id
            and a.clo_id=co.clo_id
            and co.plo_id = p.plo_id
            and p.plo_num = derived.plo_num
        GROUP BY p.plo_id,co.course_id
    '''.format(student_id))
```

```

    row = cursor.fetchall()
    cursor.close()
    table = []
    courses = []

    for entry in row:
        if entry[1] not in courses:
            courses.append(entry[1])
    courses.sort()

    plo = ["PLO1", "PLO2", "PLO3", "PLO4", "PLO5", "PLO6", "PLO7", "PLO8", "PLO9", "PLO10", "PLO11", "PLO12"]

    for i in courses:
        temptable = []
        if cat == 'report':
            temptable = [i]

        for j in plo:
            found = False
            for k in row:
                if j == k[0] and i == k[1]:
                    if cat == 'report':
                        temptable.append(np.round(100 * k[2] / k[3], 2))
                    elif cat == 'chart':
                        temptable.append(np.round(100 * k[2] / k[4], 2))
                    found = True
            if not found:
                if cat == 'report':
                    temptable.append('N/A')
                elif cat == 'chart':
                    temptable.append(0)
        table.append(temptable)
    return plo, courses, table

```

Student Performance Monitoring System

Dashboard CO WISE COURSE WISE PLO ACHIEVEMENT QUESTION BANK COURSE ACCESS COURSE OUTLINE Logout

Course ID: CSE101 Semester: Spring 2020 Section no.: 9

Instructor's details:

Name: Naam Nai
ID: 1612985
Department: CSE
User: student

Course Description

Course Objectives:

Course Outcome(CO): Here Goes Course Objectives

Assessment and Marks Distribution: Here Goes Program learning outcomes

Grade Conversion Scheme: Here goes Assement and mark distribution

The following chart will be followed for grading. This has been customized from the guideline provided by the School of Engineering and Computer Science.

A	A-	B+	B	B-	C+	C	C-	D+	D	F
90-100	85-89	80-84	75-79	70-74	65-69	60-64	55-59	50-54	45-49	0-44

Required Text:
Course Policy:
University Regulation and Code of Conduct:
Please see the Green Book for further information about academic regulation and policies, including withdrawal and grading, appeals and penalties for plagiarism and academic misconduct.

```

def CourseOutline(request):
    course_id=request.GET.get('courseid')
    section_num=request.GET.get('section')
    semester=request.GET.get('semester')
    context={
        "page":"cout",
        "id":queries.getCurrUser()[0][0],
        "group":queries.getCurrUser()[0][1],
        "name":queries.getName(str(queries.getCurrUser()[0][0])),
        "department":queries.getDept(queries.getCurrUser()[0][0]),
        # "facultyname":queries.getCourseOutline(course_id,semester,section_num)[0]+''+queries.getCourseOutline(course_id,semester,section_num)[1],
        # "facultyemail":queries.getCourseOutline(course_id,semester,section_num)[2],
        # "course_description":queries.getCourseOutline(course_id,semester,section_num)[3],
        # "required_textbook":queries.getCourseOutline(course_id,semester,section_num)[4],
        # "course_policy":queries.getCourseOutline(course_id,semester,section_num)[5],
    }
    context2=CourseOutlineData(request)
    # context.update(context2)
    return render (request,"Student\CourseOutline.html",context)

```

```

def CourseOutlineData(request):
    course_id=request.GET.get('courseid')
    section_num=request.GET.get('section')
    semester=request.GET.get('semester')
    try:
        thisDictionary={
            "facultyname":queries.getCourseOutline(course_id,semester,section_num)[0]+''+queries.getCourseOutline(course_id,semester,section_num)[1],
            "facultyemail":queries.getCourseOutline(course_id,semester,section_num)[2],
            "course_description":queries.getCourseOutline(course_id,semester,section_num)[3],
            "required_textbook":queries.getCourseOutline(course_id,semester,section_num)[4],
            "course_policy":queries.getCourseOutline(course_id,semester,section_num)[5],
        }
    except:
        pass
    return thisDictionary

```

Course ID:	Semester
CSE101	Spring 2020
Section no.:	Assessment Type:
9	Quiz

Search Questions

Q Num	Question	Marks	Weight	CO Num
1	It is a long established fact that a reader will be distracted by the readable content of a page when looking at its layout. The point of using Lorem Ipsum is that it has a more-or-less normal distribution of letters, as opposed to using 'Content here, content here', which doesn't look at all normal.			
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```
def getQuestion(semester, course_id, section_num, assessment_name):
    cursor=mydb.cursor()
    cursor.execute('''
        SELECT st.section_id
        FROM spms_student_t st,
        WHERE st.semester='{}'
        and st.course_id='{}'
        and st.section_num='{}'
    )''.format(semester, course_id, section_num))
    cursor.close()
    sectionid=cursor.fetchall()
    cursor.execute('''
        SELECT st.question_id
        FROM spms_question_t st,
        WHERE st.section_id='{}'
        and st.question_id= '{}'
    )''.format(sectionid, assessment_name))
    cursor.close()
    question=cursor.fetchall()
    return question
```

CH-5 CONCLUSION

PROBLEM & SOLUTION

1. Our ability to utilize this program to its full potential has been hampered by the limited period of the semester. We intend to make enhancements with greater analysis when given more time, but we believe we have produced the best program we could give the time and resources available.
2. We might think that we could have produced far more trustworthy and accurate outcomes, representations, and predictions if given more tools and information to work with.

ADDITIONAL FEATURE & FUTURE DEVELOPMENT

Future Development scope:

1. The number of users will be increased to include advisers, who will receive pertinent data on the students they are advising for better and more advantageous interactions between students and advisors.
2. Project goals include adding a component that predicts a candidate's grade based on prior grades and performances.

CONCLUSION & RECOMMENDATIONS

We think the idea we had for our SPM software has been created, built, and implemented in the greatest way possible. With the appropriate application of this software, we intend to significantly raise the standard of education offered by institutions. This program can be used by students who want to become better and more capable scholars, by faculties to keep better track of their students and adjust their teaching strategies accordingly, and by institution members to more effectively manage their resources.