DATABASE MANAGEMENT SYSTEM

Student Performance Monitoring System (SPMS)

FINAL REPORT

GROUP 02

Shoeb Uddin Ahmed	1920038
Istiak Ahammad Limon	1930038
Tahsin Bin Khaled	1830422

CHAPTER 1

INTRODUCTION

- BACKGROUND OF THE PROJECT
- OBJECTIVE OF THE PROJECT
- SCOPE OF THE PROJECT

A. BACKGROUND OF THE ORGANIZATION:

Independent University, Bangladesh (IUB) was established in 1993. It is one of the oldest Private Universities in Bangladesh, currently has more than an estimated 7,048 undergraduate and graduate students and over 10,455 alumni. This student population is predicted to grow at about 10% annually. Since its inception, IUB has shown remarkable outcomes in producing graduates with marketable skills by being sincere, staying disciplined, and up to date with the ongoing curriculum and progress system.

IUB has five main school distinctions under its name and they are as follows:

1. Business & Entrepreneurship
2. Engineering, Technology & Sciences
3. Environment and Life Sciences
4. Liberal Arts & Social Sciences
5. Pharmacy and Public Health.

IUB also provides massive percentage-based tuition fee waivers and scholarships for a huge proportion of these students, more than most private universities of the country. This greatly helps the financial guarantors of the students to keep up with the expenses of studies.

Furthermore, IUB is also constantly developing and improving its lab facilities and flourishing on its curriculum according to current corporate world demands, greatly diminishing the outraging gap between academic curriculum and the professional job market.

B. BACKGROUND OF THE PROJECT:

Currently, the student marking monitoring system of IUB students is done completely manually through the means of excel files and previously determined PLOs and COs from the IEB, UGC, and mapped by the respective department of each major. The stakeholders, department, or any higher authorities do not have an automated system through which they can visualize the performance data of the students throughout the semesters. So we have to change that to an automated process for everybody's convenience.

C. OBJECTIVE OF THE PROJECT:

The Student Performance Monitoring System (SPMS) that we are going to build will get all student performance data from the respective faculties and departments and vividly summarize and present all the performance data including various sorts of graphs to make it crystal clear for the Stakeholders and all the higher authorities to understand without much effort. The faculties no longer have to create vast excel sheets representing all the marks and CO/PLO achievements of each student manually, instead, the faculty will just have input the marks of each student onto the SPMS and it will automatically do all the work for the faculty, making it tons easier, faster and less hectic for the individuals. As it is all done by computer systems, the process will be instantaneous, unlike a very lengthy process from before, and all the stakeholders that have access to the system will be able to see the data right away without any issues.

D. SCOPE OF THE PROJECT:

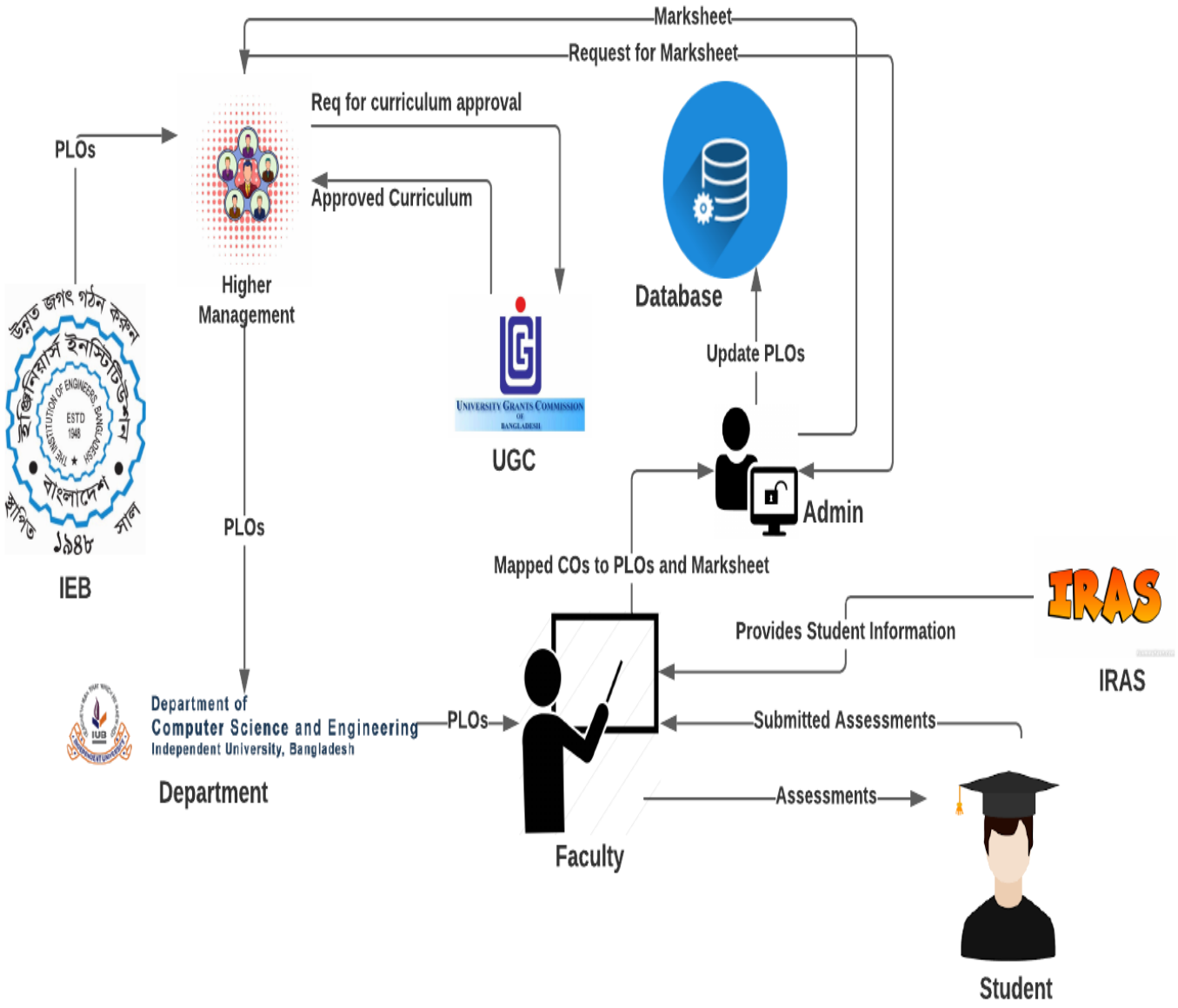
As we have done a thorough analysis of the existing marking and evaluation system and found out that there are several issues within the entire process that can lead to serious amounts of waste in time and resources. Our proposed Web Application system known as the Student Performance Monitoring System (SPMS) will eradicate all these unnecessary consumption of resources and throw them to be done automatically at the system backend. The system will include a Relational Database Management System (RDBMS) server to store and edit/update all the performance information of the student in the enrolled courses. The Web Application will have seamless and intuitive User Panels or Graphical User Interfaces (GUIs) to make it easily operable for every stakeholder involved. Each individual user type will be able to observe and download all the student data in a way that is visualized extremely vividly and also that fits most suitable for them to understand. Moreover, all the data will be stored on the server protected by high-tier cyber security means, and each user type will have access to the specific data that is relevant to only them in order to maintain the best quality privacy for every user or stakeholder.

CHAPTER 2

REQUIREMENT ANALYSIS

- RICH PICTURE AS-IS
- SIX ELEMENTS AS IS
- PROCESS DIAGRAM AS-IS
- PROBLEM ANALYSIS
- RICH PICTURE TO-BE
- SIX ELEMENTS TO-BE
- PROCESS DIAGRAM TO BE

A. Existing Business System:



B. Six Element Analysis of Existing Business:

process	Human	Non-computing Hardware	Computing Hardware	Software	Database	Communication & Network
STUDENT'S ASSESSMENT	**1.Faculty :** **a)**Create Question Paper. a) Takes exam of students in the form of quizzes, midterm and final term by providing questions. b) Create assessment report. c) Send the assessment report to admin **2.**	**Paper:** a) Used to prepare hardcopy of question papers that are used to assess students in exams. b) Used to prepare hardcopy assessment report. c) Used to provide hardcopy of answer script to the faculty. **2.Station**	**1.Computer:** a) Used to prepare softcopy of question papers that are used to assess students in exams. b) Used to prepare softcopy assessment report. c) Used to prepare softcopy of answer script to the faculty. d) Used	**1.Microsoft Word:** a) Used to prepare softcopy of question papers that are used to assess students in exams. b) Used to prepare softcopy of answer script to faculty. **2.Microsoft Excel** : a) Used to prepare softcopy assessment report. **3.Gmail :** a) Used to	**1.Google Drive:** a) Used to store and backup all softcopy of questions, answer scripts and assessment reports on the internet.	**1.ISP:** a) Provides Internet service so that the use of Gmail, Google Drive and Dropbox is possible.

	Student: a) Answers the questions provided by Faculty. b) submit the answer paper to the faculty. **3.Admin**: a) Receives and stores assessment report of students provided by Faculty. b) Store the marks of the student in the Database.	**ery:** a) Used to check hardcopy of answer script provided by students. b) Used to fill answer scripts that are to be provided to faculty. **3.Store Room:** a) Used to store all hardcopy of questions, answer scripts and assessment reports.	to store all softcopy of questions, answer scripts and assessment reports. **2.Printer**: a) Used to print the questions on to paper. b) Used to print the assessment report. c) Used to print the answer script.	send softcopy of questions, answer scripts and assessment reports to designated personnel.		

Process	Human	Non-computing Hardware	Computing Hardware	software	Database	Communication & Network
Curriculum Approval by UGC	**1.Higher Management:** a) Forms a committee of faculty to prepare a curriculum in accordance to the guideline provided by UGC. b) Receives proposed curriculum provided by the designated faculty committee. c) Requests	**1.Paper:** a) Used to prepare hardcopy of faculty committee details, UGC guidelines, proposed/ corrected curriculum, approved curriculum. **2.Stationery:** a) Used for handwritten mind mapping in regards to faculty committee details, proposed/	**1.Computer:** a)Used to receive, store and analyze UGC guidelines. b) Used to prepare and store softcopy of faculty committee details, proposed/ corrected curriculum, and approved	**1.PDF Reader:** a) Used to view and store the softcopy of received guidelines from UGC, faculty committee details, proposed/corrected curriculum and approved curriculum in PDF format. **2.Microsoft Word:** a) Used to prepare, view and store softcopy of faculty committee details, proposed/c	**1.Google Drive:** a) Used to store and backup all softcopy of faculty committee details, UGC guidelines, proposed/corrected curriculum, approved curriculum on the internet.	**1.ISP:** a) Provides Internet service so that the use of Gmail, Google Drive and Dropbox is possible.

	UGC for approval of curriculum. d. Receives approval or necessary correction details from UGC. e) Sends confirmation of approved /corrected curriculum to admin for storing. **2.UGC:** a)Receives request from higher management for approval of curriculum. b) Sends	corrected curriculum, approved curriculum. **3.Store Room:** a) Used to store hardcopy of approved curriculum.	curriculum. **2.Printer:** a) Used to print hardcopy of faculty committee details, UGC guidelines, proposed/ corrected curriculum, approved curriculum.	orrected curriculum and approved curriculum in word format. **2.Microsoft Excel:** a) Used to prepare softcopy for the mapping of CO to PO while creating courses for the curriculum. **3.Gmail :** a)Used to send softcopy of faculty committee details, UGC guidelines, proposed/corrected curriculum, approved curriculum to designated personnel.		

	approval or necessary correction details of curriculum to higher management. c) Provides guidelines to higher management for preparing the curriculum.					

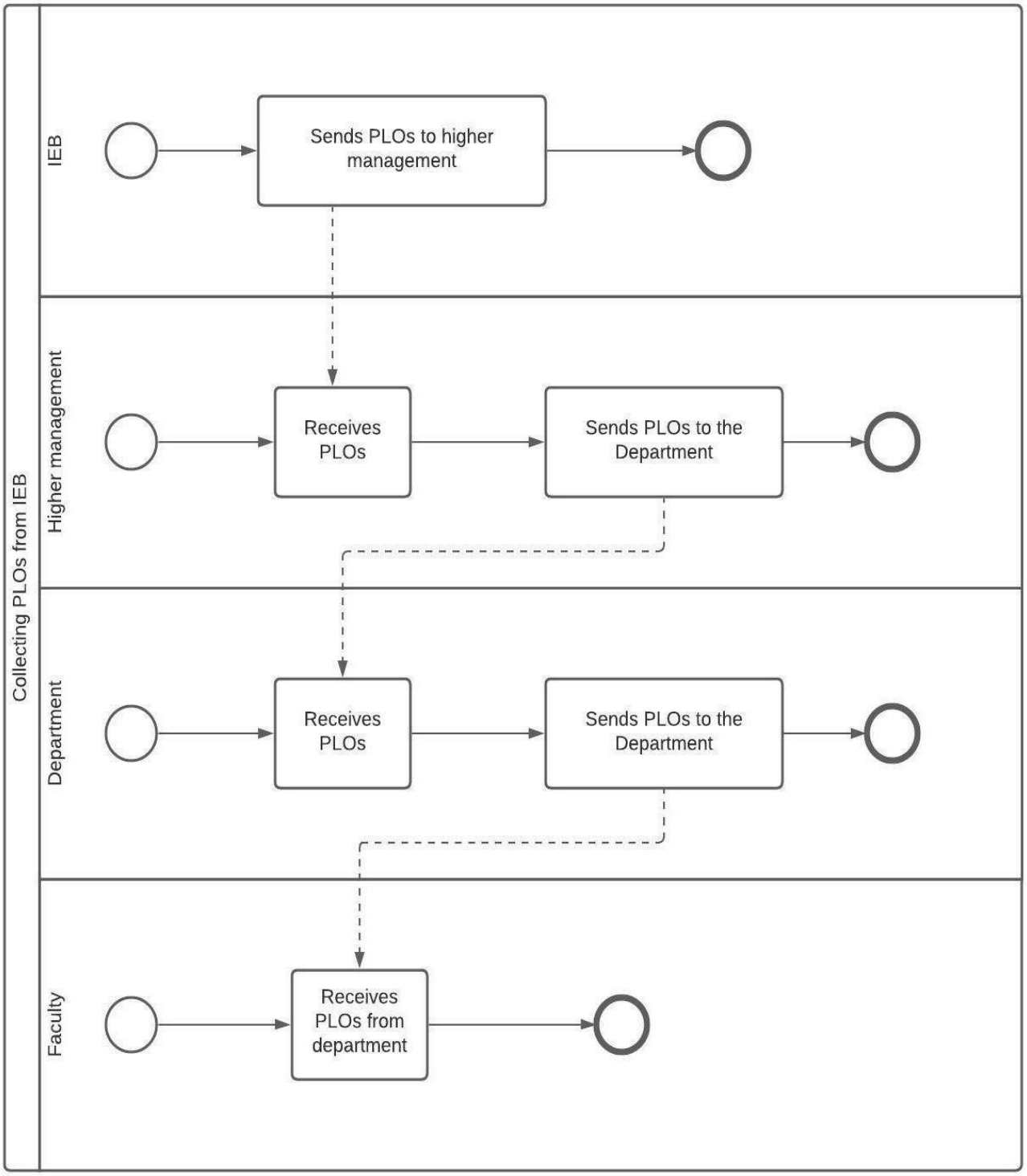
Process	Human	Non-computing Hardware	Computing Hardware	software	Database	Communication & Network
Collecting PLOs from IEB	**1. IEB:** a) Send PLOs to higher management. **2.Higher Management:** a) Receives PLOs from IEB b) Send PLOs to the department. **3.Department:** a)Send the PLOs to the Faculty **4.Faculty:** a) Receives PLOs from the Departmen t.	**1.Paper:** a) Used to prepare hardcopy Of the PLOs **2.Stationery:** a) Used for handwritten assessment to create PLO report. **3.Store room:** a) Used to store hardcopy of PLO report.	**1.Computer:** a) Used to prepare and store softcopy of PLO report. **2.Printer:** a) Used to print hardcopy of PLO report	**1.PDF Reader:** a) Used to view and store the softcopy of PLO report **2. Microsoft Excel:** a) Used to prepare, view and store softcopy of PLO report in Excel Shit. **3.Gmail:** a. Used to send/receive softcopy of PLOs from IEB to Higher manageme	**1.Google Drive:** a) Used to store and backup all softcopy of PLO Report on the internet.	**1.ISP:** a) Provides Internet service so that the use of Gmail, Google Drive and Dropbox is possible.

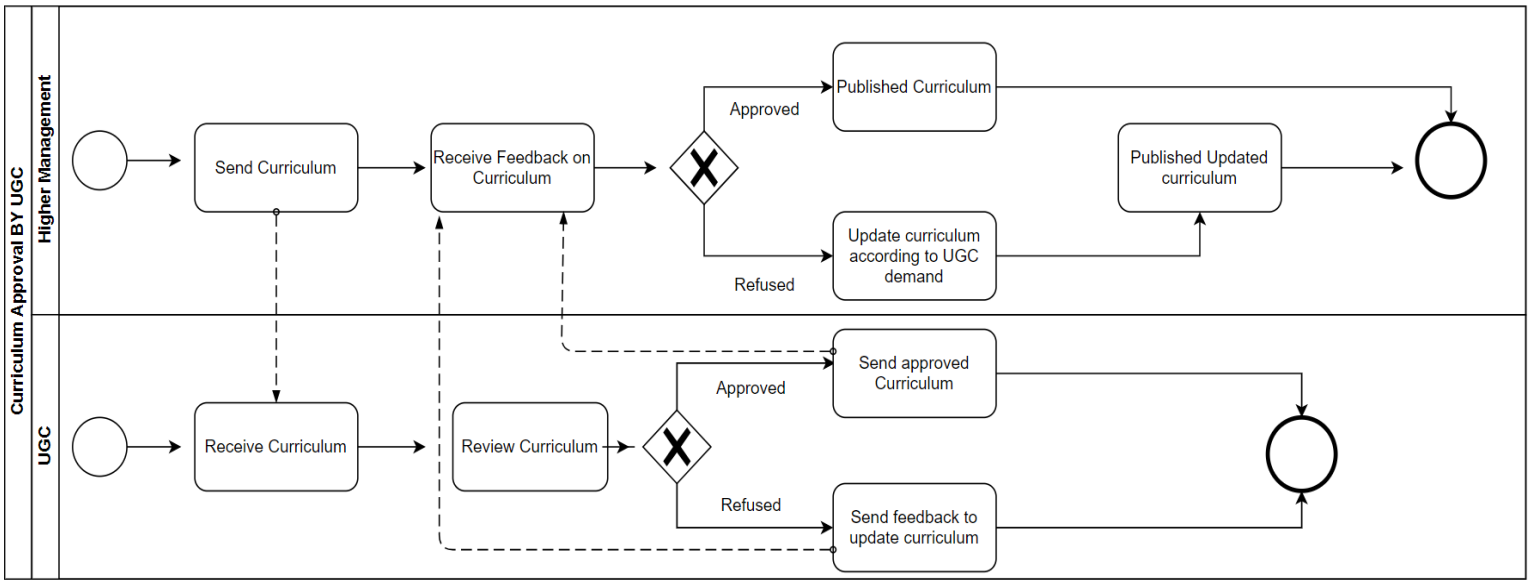
				nt to faculty to Admin personnel.		

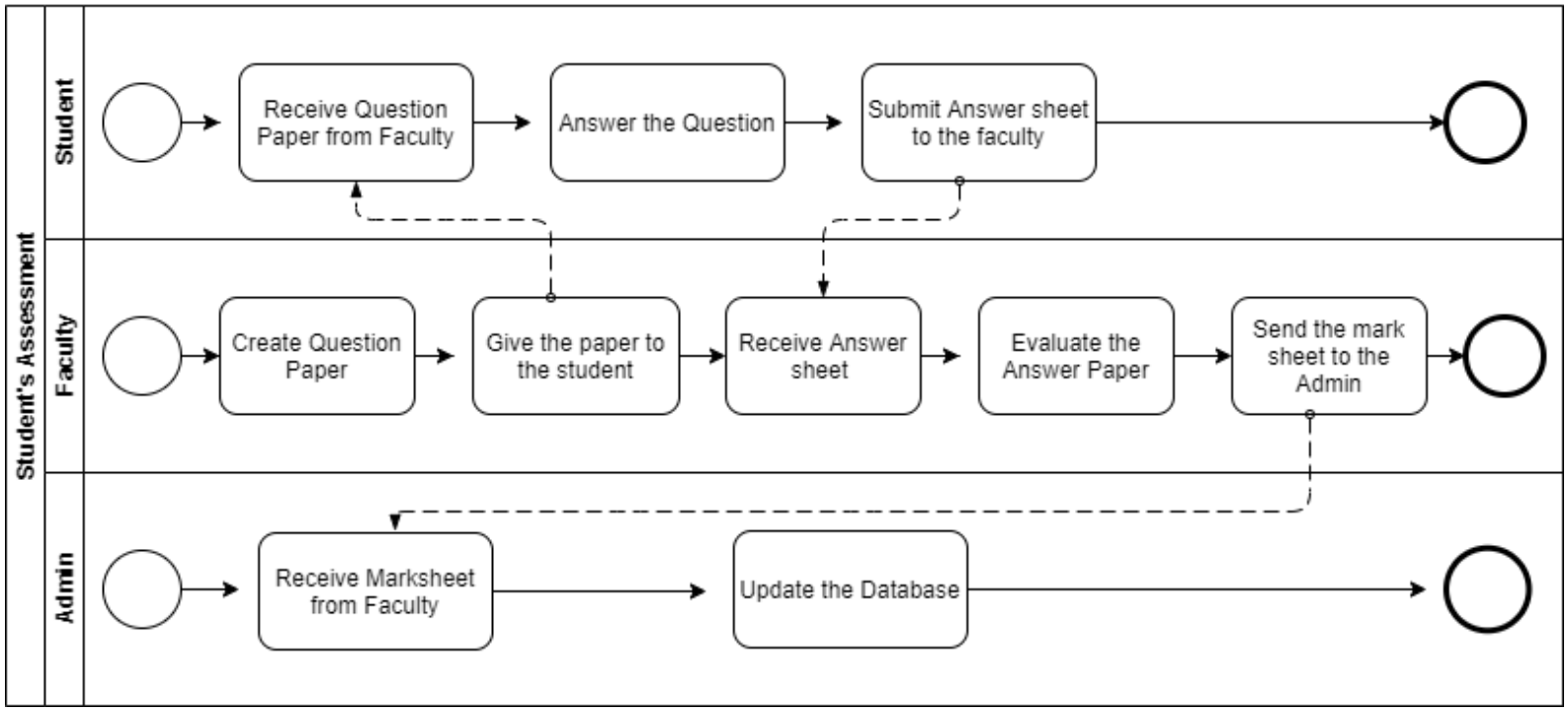
Process	Human	Non-computing Hardware	Computing Hardware	software	Database	Communication & Network
	1. Faculty Member a) Maps the COs	**Paper** a) Used if the faculty member or the	**1. Computer** a) Used to edit the COs'	**1. Microsoft Excel:** a) Used to store the	**1.Google Drive:** a) Contains the mapped	**1. ISP:** a)Provides Internet service so that the use of Gmail, Google Drive and Dropbox

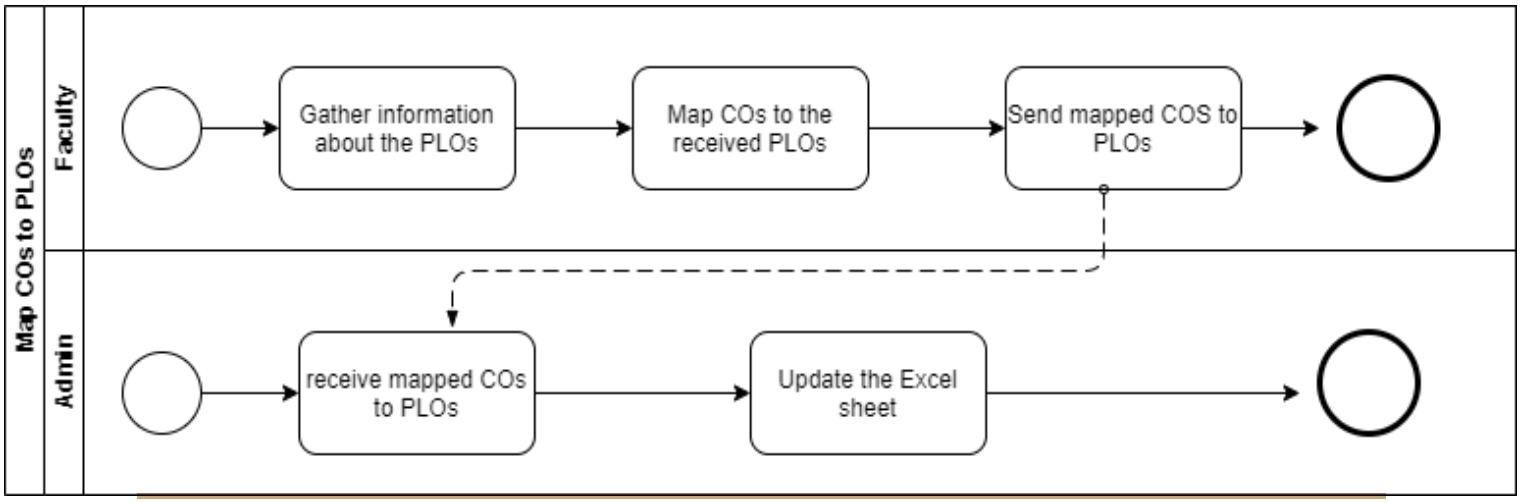
Mapping of COs to PLOs	from PLOs based on the syllabus covered in the course. b) Sends the mapped COs to the admin through email. **2. Admin** a) Receives the mapped COs from the faculty member. b) Updates it in the excel file.	admin wishes to print out the mapped COs.	Excel file. **2. Printer** a) Used to print out the COs for hardcopy storage backup in case something happens to the digital version.	mapped COs. **2. Web Browser:** a) To send and receive the COs through email.	COs. **2. Hard Copy storage:** a) Contains the hardcopy version of the COs' Excel file for backup.	is possible.

C. Process Diagram (AS-IS):




Curriculum Approval BY UGC
Higher Management
Send Curriculum
Receive Feedback on Curriculum
Approved
Published Curriculum
Published Updated curriculum
Refused
Update curriculum according to UGC demand
UGC
Receive Curriculum
Review Curriculum
Approved
Send approved Curriculum
Refused
Send feedback to update curriculum


Student's Assessment
Student
Receive Question Paper from Faculty
Answer the Question
Submit Answer sheet to the faculty
Faculty
Create Question Paper
Give the paper to the student
Receive Answer sheet
Evaluate the Answer Paper
Send the mark sheet to the Admin
Admin
Receive Marksheet from Faculty
Update the Database

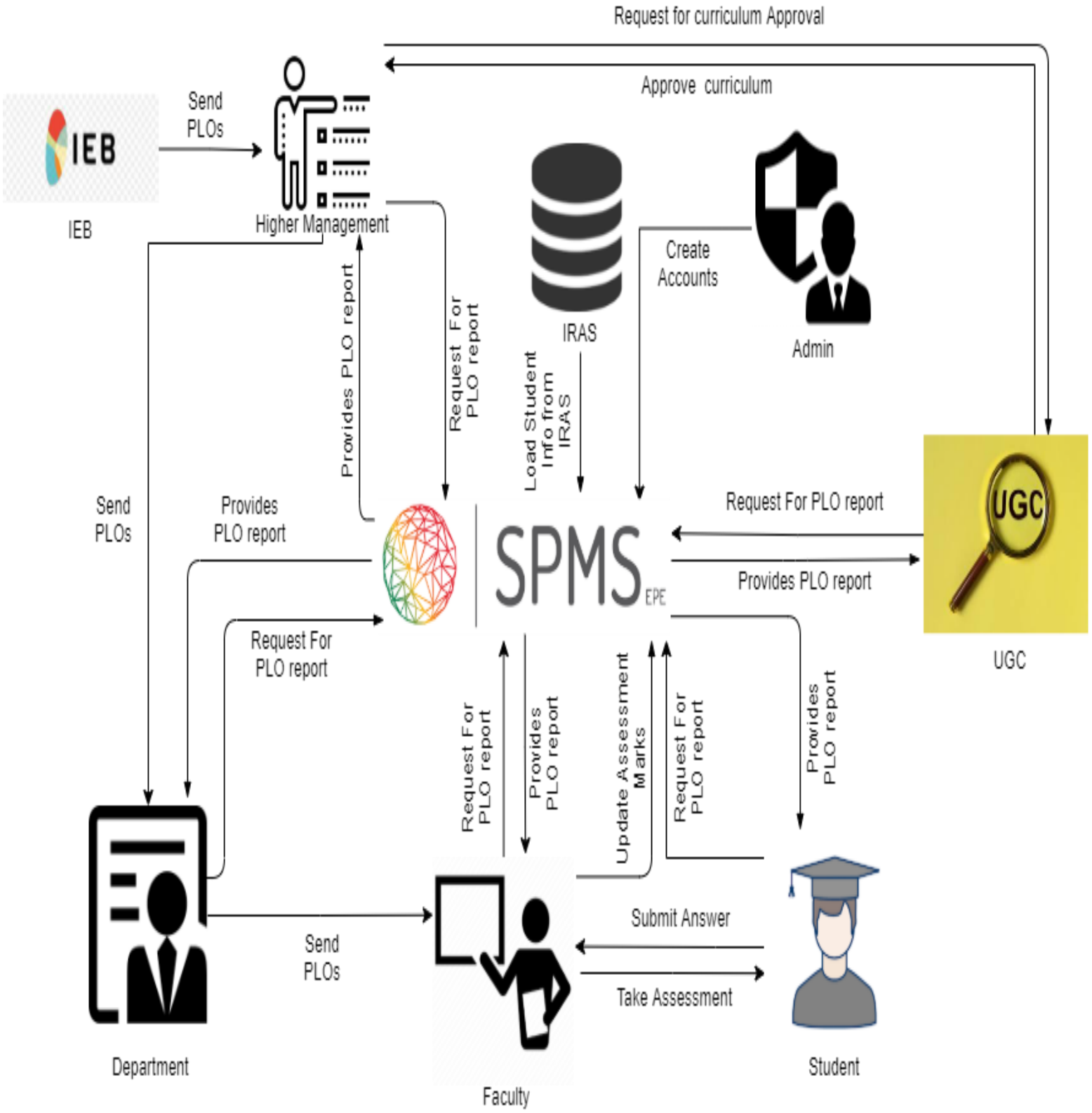

Map COs to PLOs
Faculty
Gather information about the PLOs
Map COs to the received PLOs
Send mapped COS to PLOs
Admin
receive mapped COs to PLOs
Update the Excel sheet

Problem analysis Of the Existing System:

Process Name	Stakeholders	Concerns (Problems)	Analysis (Reason of the Problem)	Proposed Solution
STUDENT'S ASSESSMENT	1.Faculty 2.Admin	The Faculty members have to provide the mark sheet to Admin and then the Admin enters the mark sheet into the Database. This process becomes too time-consuming and uses up a lot of extra resources.	Since the faculty has to send the mark sheet all the way to the admin before getting uploaded to the database, it takes up much of the time and also uses unnecessary resources.	Our software allows the faculty to directly update the marks to the database. Hence, the use or participation of the admin is not required.

PLO/CO Achievement Analysis	**1. Faculty**	The CO, PLO achievement analysis has to be done by the faculty by manually entering marks of each student to finalize whether they pass or fail. The analysis has to be sent to the admin to be uploaded to the database.	The entire CO, PLO achievement analysis table, and the passing of the data is extremely time-consuming.	Our software is designed to do the entire CO, PLO achievement analysis by itself. All the faculty has to do is enter the marks in the desired field.

E. Rich Picture of Proposed System:



F. Six Element Analysis of Proposed System:

Process	System Roles					
	Human	Non-Comp Hardware	Computing Hardware	Software	Database	Network & Communication
STUDENT'S ASSESSMENT	**1.Faculty :** a)Create Question Paper. b) Takes exam of students in the form of quizzes, midterm and final term by providing questions. c) Create assessment report. d) Updates assessment marks directly to SPMS **2.Student**	**1.Paper:** a) Used to prepare hardcopy of question papers that are used to assess students in exams. b) Used to prepare hardcopy assessment report. c) Used to provide hardcopy of answer script to the faculty. **2.Stationery:** a) Used to check	**1.Computer:** a) Used to prepare softcopy of question papers that are used to assess students in exams. b) Used to prepare softcopy assessment report.	**1.Microsoft Word:** a) Used to prepare softcopy of question papers that are used to assess students in exams. b) Used to prepare softcopy of answer script to faculty. **2.Microsoft** Excel : a) Used to prepare softcopy assessment report. **3.Gmail :** a) Used to	**1.Google Drive:** a) Used to store and backup all softcopy of questions, answer scripts and assessment reports on the internet. 2. **SPMS** - Updates and stores mark sheet in MySQL	**1.ISP:** a) Provides Internet service so that the use of Gmail, Google Drive and SPMS is possible.

	: a) Answers the questions provided by Faculty. b) submit the answer paper to the faculty.	hardcopy of answer script provided by students. b) Used to fill answer scripts that are to be provided to faculty. **3.Store Room:** a) Used to store all hardcopy of questions, answer scripts and assessment reports.	c) Used to prepare softcopy of answer script to the faculty. d) Used to store all softcopy of questions, answer scripts and assessment reports. **2.Printer:** a) Used to print the questions on to paper. b) Used to print the assess	send softcopy of questions, answer scripts and assessment reports to designated personnel.		

			ment report. c) Used to print the answer script.			
Curriculum Approval by UGC	**1.Higher Management:** a) Forms a committee of faculty to prepare a curriculum in accordance to the guideline provided by UGC. b) Receives proposed curriculum provided by the designated faculty committee. c) Requests UGC for approval of curriculum. d. Receives approval or necessary	**1.Paper:** a) Used to prepare hardcopy of faculty committee details, UGC guidelines, proposed/ corrected curriculum, approved curriculum. **2.Stationery:** a) Used for handwritten mind mapping in regards to faculty committee details, proposed/ corrected curriculum, approved curriculum. **3.Store Room:**	**1.Computer:** a)Used to receive, store and analyze UGC guidelines. b) Used to prepare and store softcopy of faculty committee details, proposed/ corrected curriculum, and approved curriculum.	**1.PDF Reader:** a) Used to view and store the softcopy of received guidelines from UGC, faculty committee details, proposed/ corrected curriculum and approved curriculum in PDF format. **2.Microsoft Word:** a) Used to prepare, view and store softcopy of faculty committee details, proposed/ corrected curriculum	**1.Google Drive:** a) Used to store and backup all softcopy of faculty committee details, UGC guidelines, proposed/ corrected curriculum, approved curriculum on the internet.	**1.ISP:** a) Provides Internet service so that the use of Gmail, Google Drive is possible.

	correction details from UGC. e) Sends confirmation of approved/ corrected curriculum to admin for storing. **2.UGC:** a)Receives request from higher management for approval of curriculum. b) Sends approval or necessary correction details of curriculum to higher management. c) Provides guidelines to higher management for preparing the	a) Used to store hardcopy of approved curriculum.	**2.Printer:** a) Used to print hardcopy of faculty committee details, UGC guidelines, proposed/ corrected curriculum, approved curriculum.	and approved curriculum in word format. **2.Microsoft Excel:** a) Used to prepare softcopy for the mapping of CO to PO while creating courses for the curriculum. **3.Gmail :** a)Used to send softcopy of faculty committee details, UGC guidelines, proposed/ corrected curriculum, approved curriculum to designated personnel.		

	curriculum.					
Collecting PLOs from IEB	**1. IEB:** a) Send PLOs to higher management. **2.Higher Management:** a) Receives PLOs from IEB b) Send PLOs to the department. **3.Department:** a)Send the PLOs to the Faculty **4.Faculty:** a) Receives PLOs from the Department.	**1.Paper:** a) Used to prepare hardcopy Of the PLOs **2.Stationery:** a) Used for handwritten assessment to create PLO report. **3.Store room:** a) Used to store hardcopy of PLO report.	**1.Computer:** a) Used to prepare and store softcopy of PLO report. **2.Printer:** a) Used to print hardcopy of PLO report	**1.PDF Reader:** a) Used to view and store the softcopy of PLO report **2. Microsoft Excel:** a) Used to prepare, view and store softcopy of PLO report in Excel Shit. **3.Gmail:** a. Used to send/receive softcopy of PLOs from IEB to Higher management to faculty to	**1.Google Drive:** a) Used to store and backup all softcopy of PLO Report on the internet.	**1.ISP:** a) Provides Internet service so that the use of Gmail, Google Drive is possible.

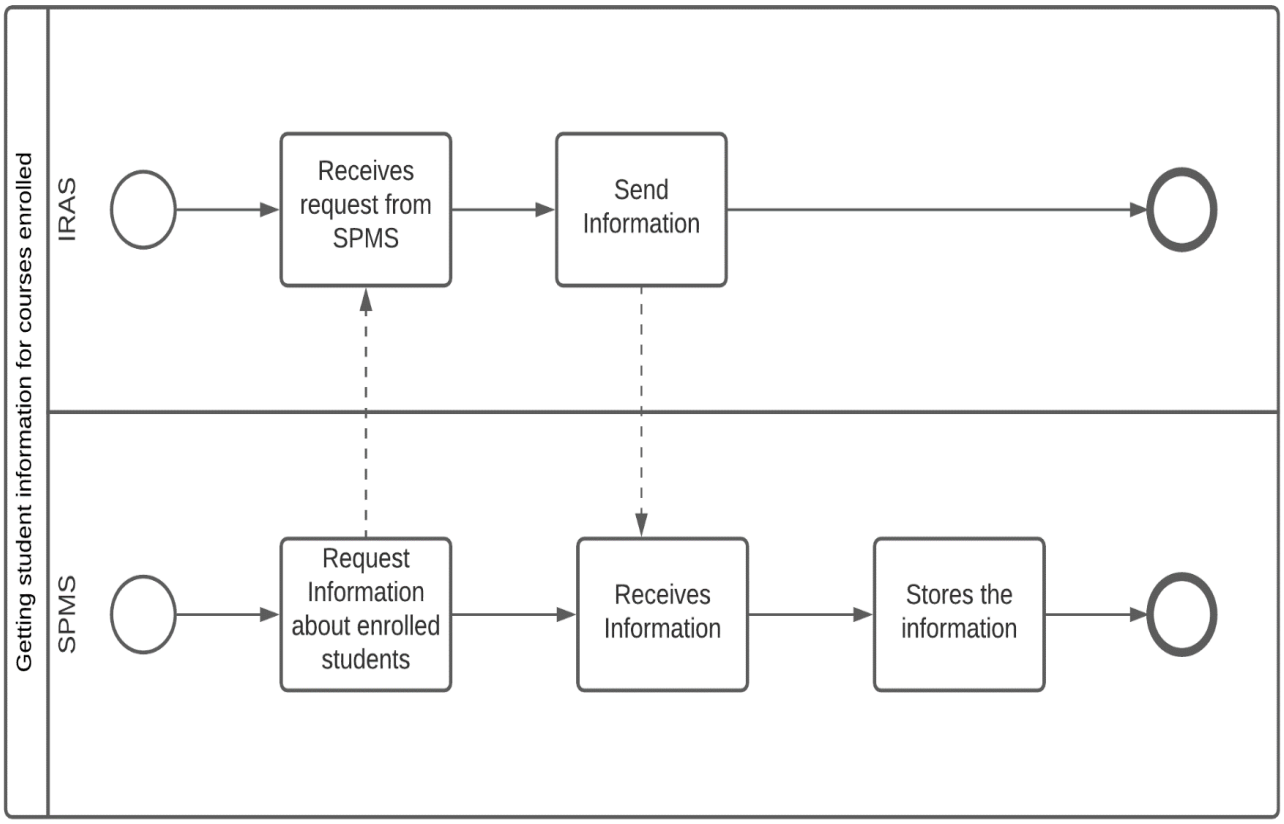
				Admin personnel.		

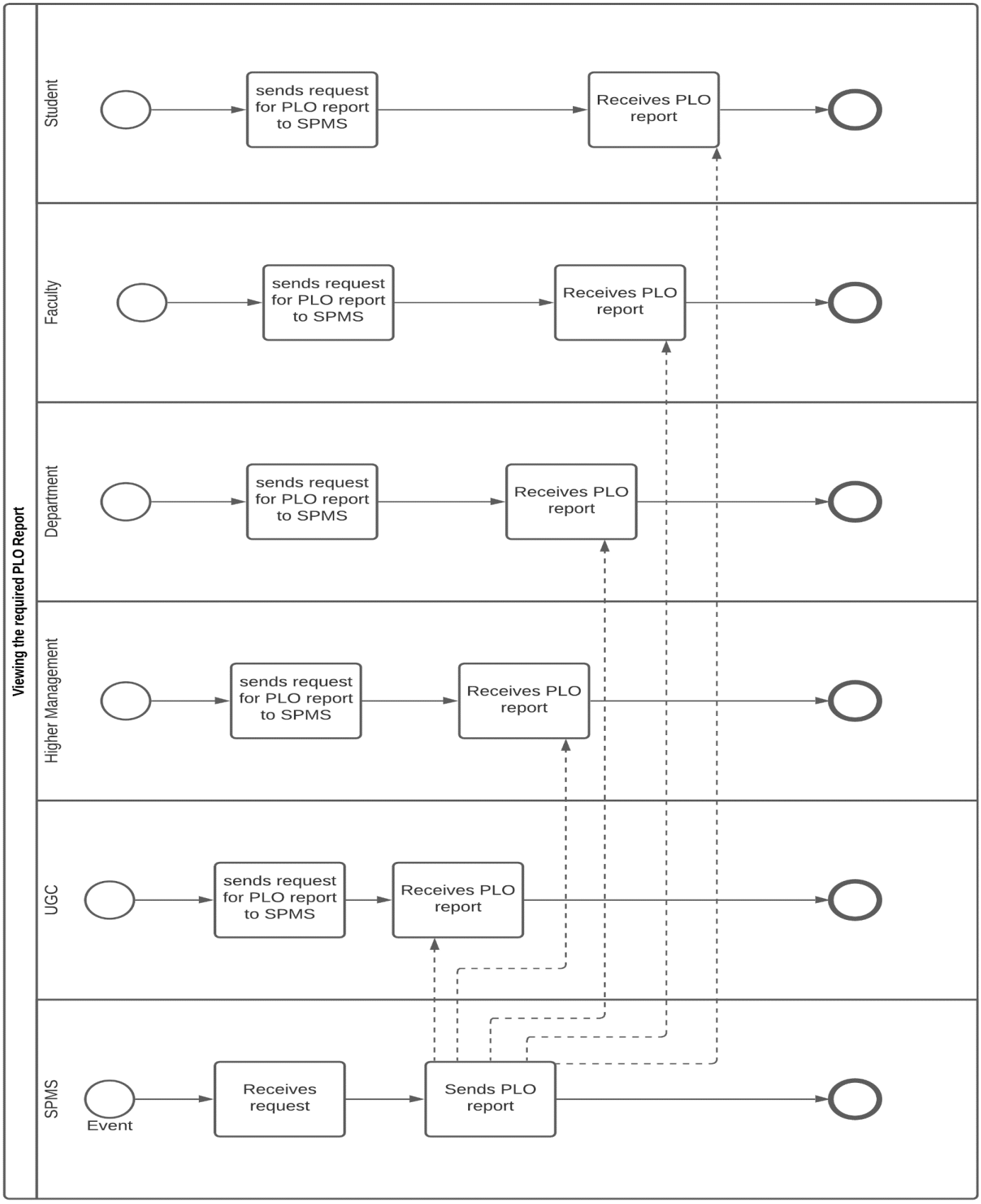
Getting student information for courses enrolled			**Server Computer** – SPMS sends requests to IRAS for student information on courses enrolled each semester through API.	**1.SPMS:** a) Sends requests to IRAS for Student information on courses enrolled each semester through API. **2. IRAS:** a) Sends requested information to SPMS.	**1.MySQL:** Stores Student information on courses enrolled each semester	**1.ISP:** SPMS and IRAS require internet which is provided by ISP.

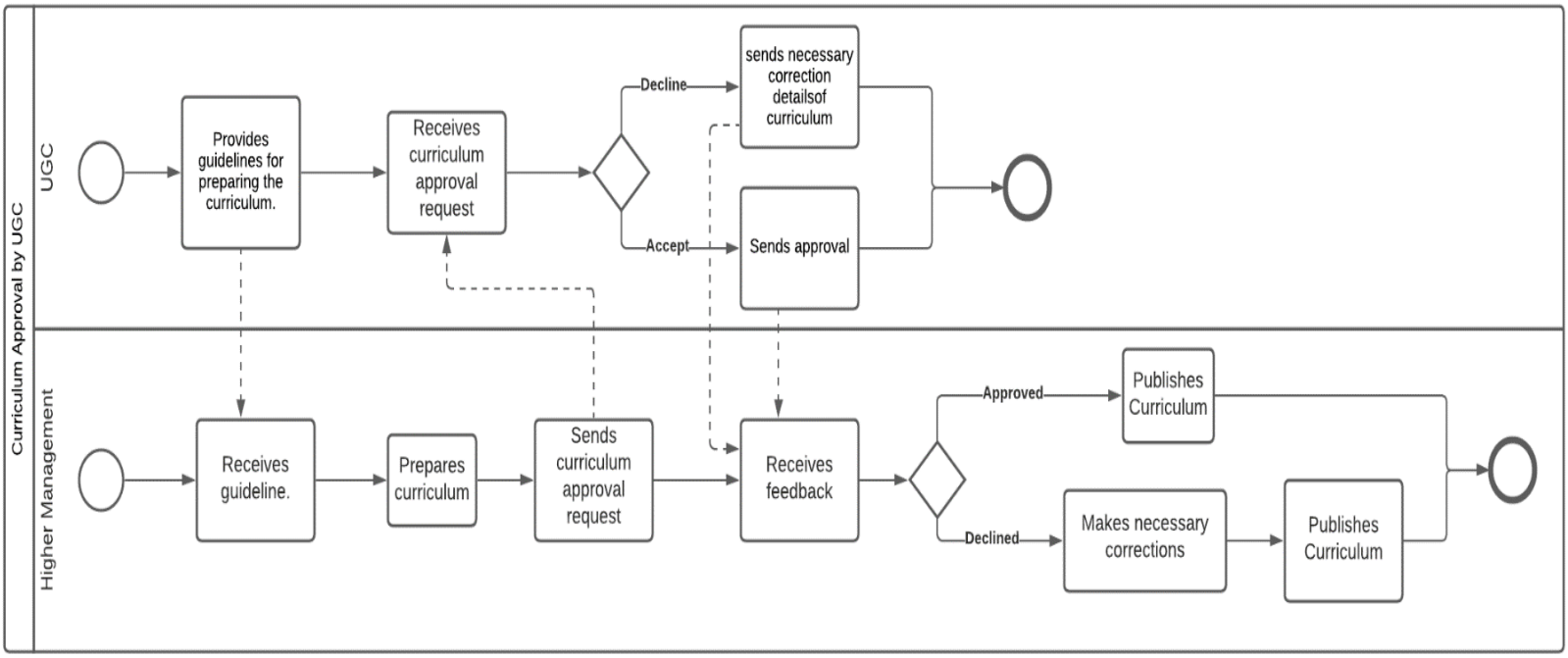
Viewing the required PLO Report	1.**UGC** a) Request for information on PLO report b) Get the information from the system. 2.**Higher Management** a) Request for information on PLO report b) Get the information from the system. 3.**Department** a) Request for information on PLO report b) Get the information from the system. 4.**Faculty** a) Request for information on PLO report b) Get the information from the		1.**Computer**: Used to browse PLO reports from SPMS. 2.**Phone**: Use to browse PLO report from SPMS	1.**SPMS**: Prepare the required PLO report for stakeholders 2. **Web Browser**: Access the SPMS website	1. **MY SQL**: Store the necessary data which are used to make the POL report.	1. **ISP**: Provides Internet service to the Stakeholders so that they can access the information.

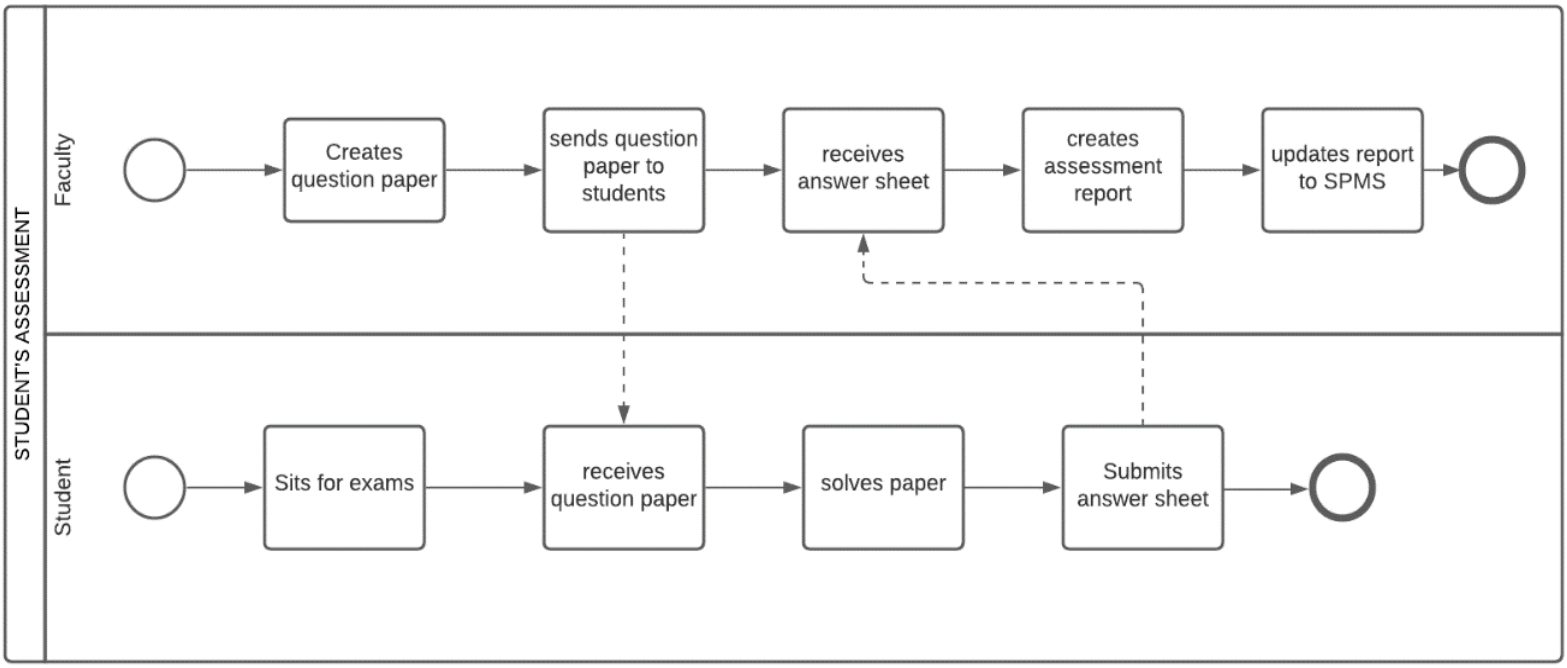
	system. 5.**Student** a) Request for information on PLO report b) Get the information from the system.					

G. Process Diagram (TO-BE):




Viewing the required PLO Report
Student
sends request for PLO report to SPMS
Receives PLO report
Faculty
sends request for PLO report to SPMS
Receives PLO report
Department
sends request for PLO report to SPMS
Receives PLO report
Higher Management
sends request for PLO report to SPMS
Receives PLO report
UGC
sends request for PLO report to SPMS
Receives PLO report
SPMS
Event
Receives request
Sends PLO report


Curriculum Approval by UGC
UGC
Provides guidelines for preparing the curriculum.
Receives curriculum approval request
Decline
Accept
sends necessary correction detailsof curriculum
Sends approval
Higher Management
Receives guideline.
Prepares curriculum
Sends curriculum approval request
Receives feedback
Approved
Declined
Publishes Curriculum
Makes necessary corrections
Publishes Curriculum


STUDENT'S ASSESSMENT
Faculty
Creates question paper
sends question paper to students
receives answer sheet
creates assessment report
updates report to SPMS
Student
Sits for exams
receives question paper
solves paper
Submits answer sheet

CHAPTER 3

LOGICAL SYSTEM DESIGN

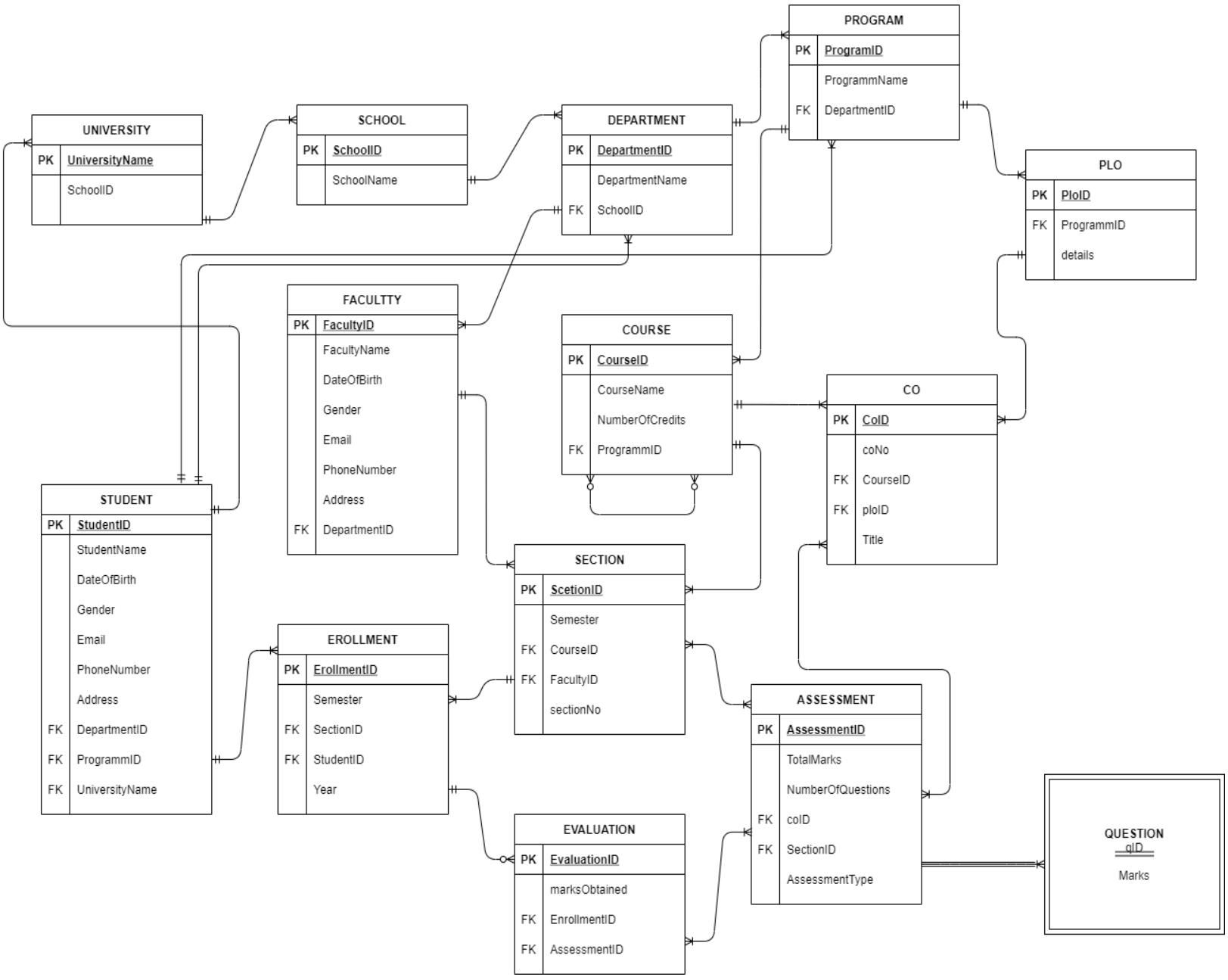
- BUSINESS RULE
- ENTITY-RELATIONSHIP DIAGRAM
    - ENTITY RELATIONSHIP DIAGRAM TO RELATIONAL SCHEMA
- NORMALIZATION
- DATA DICTIONARY

BUSINESS RULE

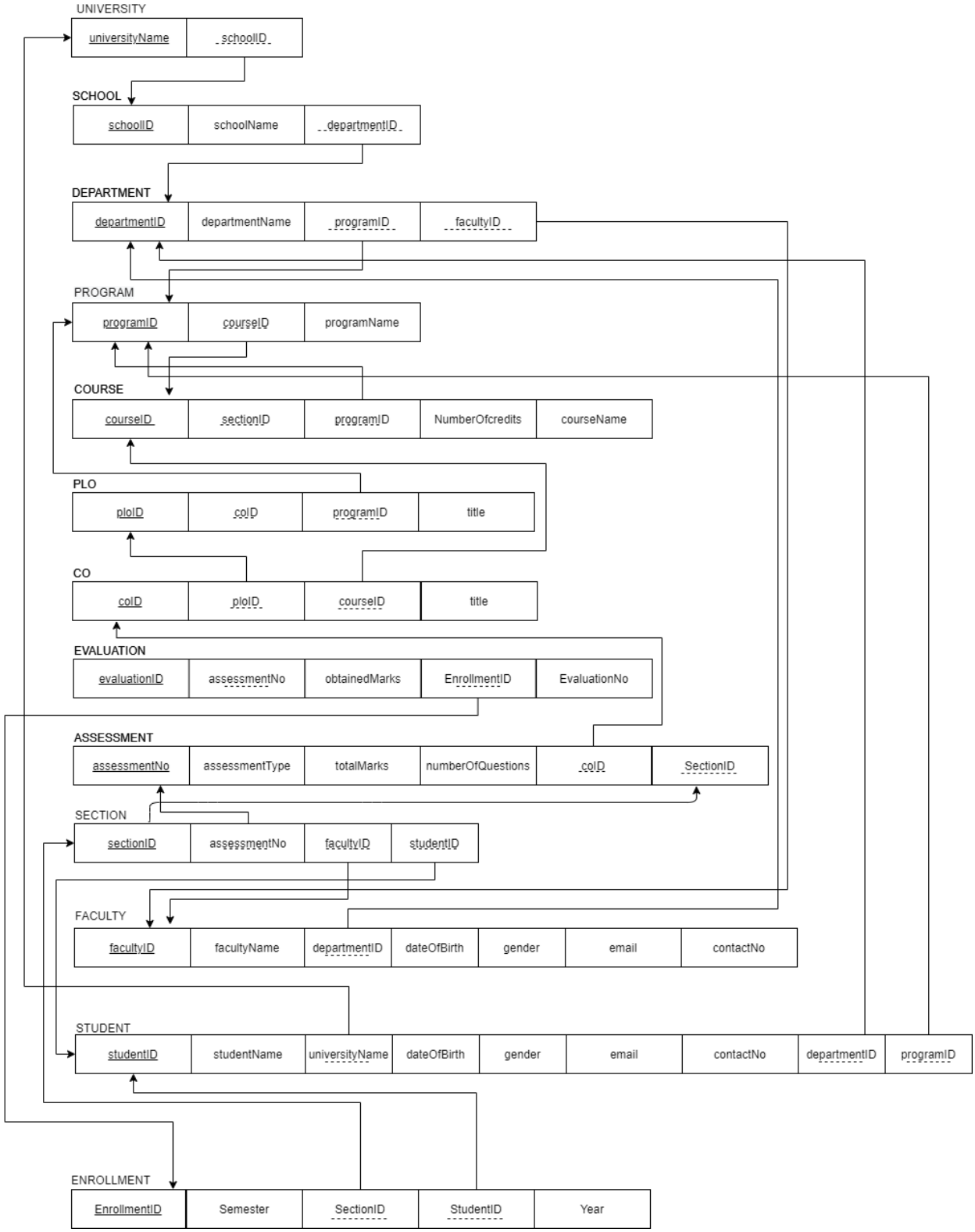
The goal of the software is to increase efficiency in monitoring the students' performance. The SPM system is where all the PLO(Program Learning Outcome) and CO(Course Outcome) is stored. The CO needs to be updated by the faculty for each course and before the semester starts to map the COs to the PLOs so that they can check if each student has achieved the required PLOs.

In the system, IEB has no authorization to update the PLOs, so it has to send it to the Admin and then the Admin updates the PLO for the faculties to map. The faculties can update the COs based on the given PLOs. The students can view their achieved PLOs for a particular course they've taken and see the required PLOs for the program in the system UGC has no authorization in monitoring the student's performance so they have to request it through admin in order to view it.

ENTITY-RELATIONSHIP DIAGRAM



ENTITY RELATIONSHIP DIAGRAM TO RELATIONAL SCHEMA



NORMALIZATION

Enrollment	EnrollmentID	e1	Evaluation	EvaluationID	v1
	semester	e2		evaluationNo	v2
	year	e3		obtainedMarks	v3
	StudentID	t1		assessmentNo	a1
	SectionID	q1		EnrollmentID	e1
Section	SectionID	q1	Student	StudentID	t1
	sectionNo	q2		studentName	t2
	semester	q3		UniversityName	u1
	CourseID	o1		dateOfBirth	t4
	FacultyID	f1		gender	t5
Course	CourseID	o1		email	t6
	courseName	o2		phone	t7
	noOfCredits	o3		address	t8
	courseType	o4		DepartmentID	d1

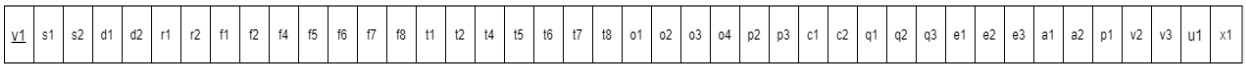
	ProgramID	r1		ProgramID	r1
Program	ProgramID	r1	Faculty	FacultyID	f1
	programName	r2		facultyName	f2
	DepartmentID	d1			
Course	CourseID	o1		gender	f4
	courseName	o2		dateOfBirth	f5
	noOfCredits	o3		email	f6
	courseType	o4		phone	f7
	ProgramID	r1		address	f8
School	SchoolID	s1		DepartmentID	d1
	SchoolName	s2	Assessment	assessmentNo	a1
CO	coID	c1		marksObtained	a2
	coNo	c2		coID	c1
	ploID	p1		SectionID	q1
	title	z1		NumberOfQuestions	x1
	CourseID	o1	PLO	ploID	p1

Department	DepartmentID	d1		ploNo	p2
	DepartmentName	d2		details	p3
	SchoolID	s1		ProgramID	r1
University	universityName	u1			
	schoolID	s1			

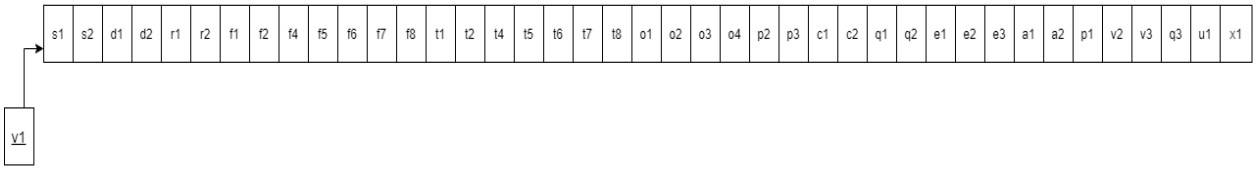
u1➔	s1
s1➔	s2
d1➔	d2, s1
r1➔	r2, d1
f1➔	f3, f4, f5, f6, f7, f8, d1
t1➔	t2, t4, t5, t6, t7, t8, r1, d1,u1
o1➔	o2, o3, o4, r1
p1➔	p2, p3, r1
c1➔	c2, p1, o1,z1
q1➔	q2, q3, o1, f1
e1➔	e2, e3, q1, t1
a1➔	a2, c1, q1,x1
v1➔	v2, v3, a1, e1

universityName➔	schoolID
SchoolID➔	SchoolName
DepartmentID➔	DepartmentName, SchoolID
ProgramID➔	programName, DepartmentID
FacultyID➔	facultyName, gender, dateOfBirth, email, phone, address, DepartmentID
StudentID➔	studentName, dateOfBirth, gender, email, phone, address,DepartmentID,ProgramID,universityName
CourseID➔	courseName, noOfCredits, courseType, ProgramID
ploID➔	ploNo, details, ProgramID
coID➔	coNo, ploID, CourseID, title
SectionID➔	sectionNo, semester, CourseID, FacultyID
EnrollmentID➔	semester, year, SectionID, StudentID
assessmentNo➔	ocID, SectionID,assessmentType, NumberOfQuestions
EvaluationID➔	evaluationNo, obtainedMarks, assesmentNo, EnrollmentID

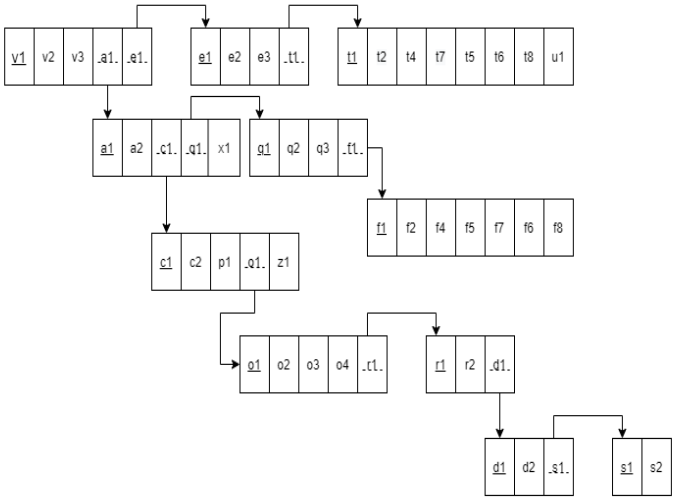
1NF



2NF



3NF



BCNF

No non-key can identify any primary key or part of the primary key.
Therefore, all the relations are already in BCNF.

DATA DICTIONARY:

university_T

Name	Data Type	Size	Remark
UniversityName	VARCHAR	15	This is the Primary Key of the Department. Example: "IUB"
SchoolID	VARCHAR	10	This is the Foreign Key of the table School. Example: "SETS"

Department_T

Name	Data Type	Size	Remark
DepartmentID	VARCHAR	10	This is the Primary Key of the Department. Example: "CSE"
DepartmentName	VARCHAR	30	This is the name of the Department. Example: "Computer Science and Engineering"
school_id	VARCHAR	5	This is the Foreign Key of the table

			School. Example: "SETS"

School_T

Name	Data Type	Size	Remark
SchoolID	VARCHAR	10	This is the Primary Key of School Example: "SETS"
SchoolName	VARCHAR	30	This is the name of the School. Example: "School of Engineering, Technology and Science"

Program_T

Name	Data Type	Size	Remark
ProgramID	VARCHAR	10	This is the Primary Key for a Program Example: "B.Sc".
ProgramName	VARCHAR	30	This is the name of the Degree Program. Example: "Bachelor of

			Science"
department_id	VARCHAR	10	This is the Foreign Key from the Department table. Example: "CSE"

Student_T

Name	Data Type	Size	Remark
StudentID	VARCHAR	10	This is the Primary Key for the Student. Example: "1930038"
StudentName	VARCHAR	30	This is the first name of the Student. Example: "Istiak Ahammad"
DateOfBirth	DATE	DD-MM-YY	This is the Date of Birth of the Student. Example: "08-11-2000"
Gender	VARCHAR	3	This is the gender of the Student. Example: "M"

Email	VARCHAR	30	This is the email address of the Student. Example: "1930038@iub.edu.bd"
Address	VARCHAR	35	This is the address of the Student. Example: "House 1, Road 1, Sector 1, Uttara, Dhaka, Bangladesh"
department_id	VARCHAR	10	This is the Foreign Key from the Department table. Example: "CSE"
programm_id	VARCHAR	10	This is the Foreign Key from the Program table Example: "B.Sc".
university_name	VARCHAR	15	Foreign Key from the university table Example: "IUB".

CO_T

Name	Data Type	Size	Remark
CoID	VARCHAR	10	This is the

			Primary Key for Course Outcome. Example:
CoNo	VARCHAR	10	This is the number of the Course Outcome. Example: "1"
course_id	VARCHAR	10	This is the Foreign Key from the Course table. Example: "CSE101"
plo_id	VARCHAR	10	This is the foreign key from the Program Learning Outcome table. Example: "PLO1"
Title	VARCHAR	50	This is the title of the Course Outcome. Example: "Deep Thinking"

PLO_T

Name	Data Type	Size	Remark
PloNo	VARCHAR	10	This is the primary key for Program Learning Outcome. Example: "PLO1"

program_id	VARCHAR	10	This is the foreign key from the Program table Example: "B.Sc".
details	VARCHAR	50	This is the details of the Program Learning Outcome. Example: "An ability to select and apply the knowledge, techniques, skills, and modern tools of the computer science and engineering discipline"

Faculty_T

Name	Data Type	Size	Remark
FacultyID	VARCHAR	10	This is the Primary Key for Faculty. Example: "1801"
FacultyName	VARCHAR	30	This is the name of the

			Faculty. Example: "Abu sayed"
DateOfBirth	DATE	DD-MM-YY	This is the Date of Birth of the Faculty. Example: "11-05-1989"
Gender	VARCHAR	3	This is the gender of the Faculty. Example: "M"
Email	VARCHAR	30	This is the email address of the Faculty. Example: "abusayed@iub.edu.bd"
PhoneNumber	VARCHAR	20	This is the phone number of the Faculty. Example: "145687015"
department_id		10	This is the Foreign Key from the Department table. Example: "CSE"

Course_T

Name	Data Type	Size	Remark
CourseID	VARCHAR	10	This is the

			Primary Key for the Course. Example: "CSE203"
CourseName	VARCHAR	30	This is the name of the Course. Example: "Data Structure"
NumberOfCredits	VARCHAR	3	This is the credit for the Course. Example: "3"
program_id	VARCHAR	10	This is the Foreign Key from the Program table Example: "B.Sc".

Section_T

Name	Data Type	Size	Remark
SectionID	VARCHAR	10	This is the Primary Key for Section
Semester	VARCHAR	15	This is the semester name: "Autumn"
course_id	VARCHAR	10	This is the foreign key from the Course table. Example: "CSE101"
faculty_id	VARCHAR	10	This is the foreign key from Faculty table

			Example: "1801"
SectionNo	VARCHAR	5	This is the section number. Example: "1"

Enrollment_T

Name	Data Type	Size	Remark
EnrollmentID	VARCHAR	10	This is the Primary Key for Enrollment
Semester	VARCHAR	15	This is the semester of Enrollment Example: "Summer"
section_id	VARCHAR	10	This is the Foreign Key from the Section table
student_id	VARCHAR	10	This is the Foreign key from the Student Table. Example: "1930038"

Year	VARCHAR	5	This is the year of Enrollment Example: "2019"

Assessment_T

Name	Data Type	Size	Remark
AssessmentNo	VARCHAR	10	This is the Primary Key for Enrollment
marksObtained	VARCHAR	5	This is the marks of the assessment Example: "30"
numberOfQuestion	VARCHAR	5	This is the number of questions in the assessment Example: "10"
co_id	VARCHAR	10	This is the Foreign Key from the Course
sectoion_id	VARCHAR	10	This is the Foreign Key from Section table
AssessmentType	VARCHAR	15	This is the type of assessment: "Mid

			Term"

Evaluation_T

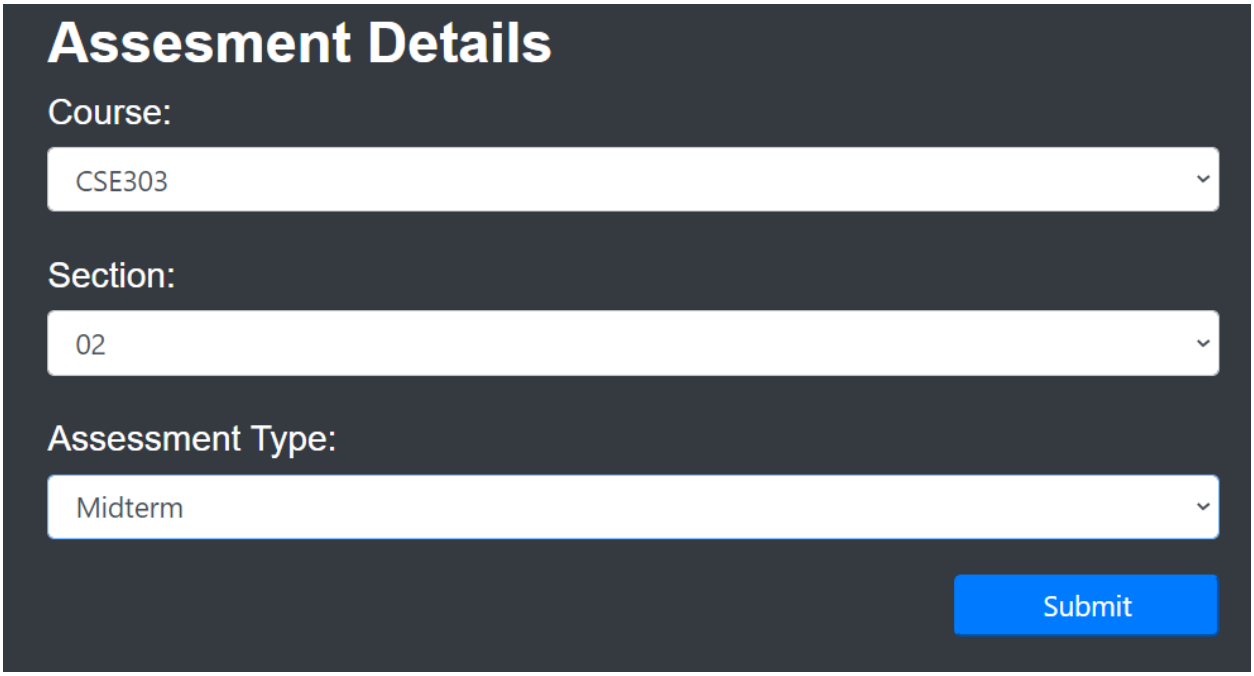
Name	Data Type	Size	Remark
EvaluationID	VARCHAR	10	This is the Primary Key for Evaluation
marksObtained	VARCHAR	5	These is the marks obtained by the Student Example: "29.5"
enrollment_id	VARCHAR	10	This is the Foreign Key from the Enrollment table
assessment_no	VARCHAR	15	This is the Foreign Key from the Assessment table

CHAPTER 4

PHYSICAL SYSTEM DESIGN

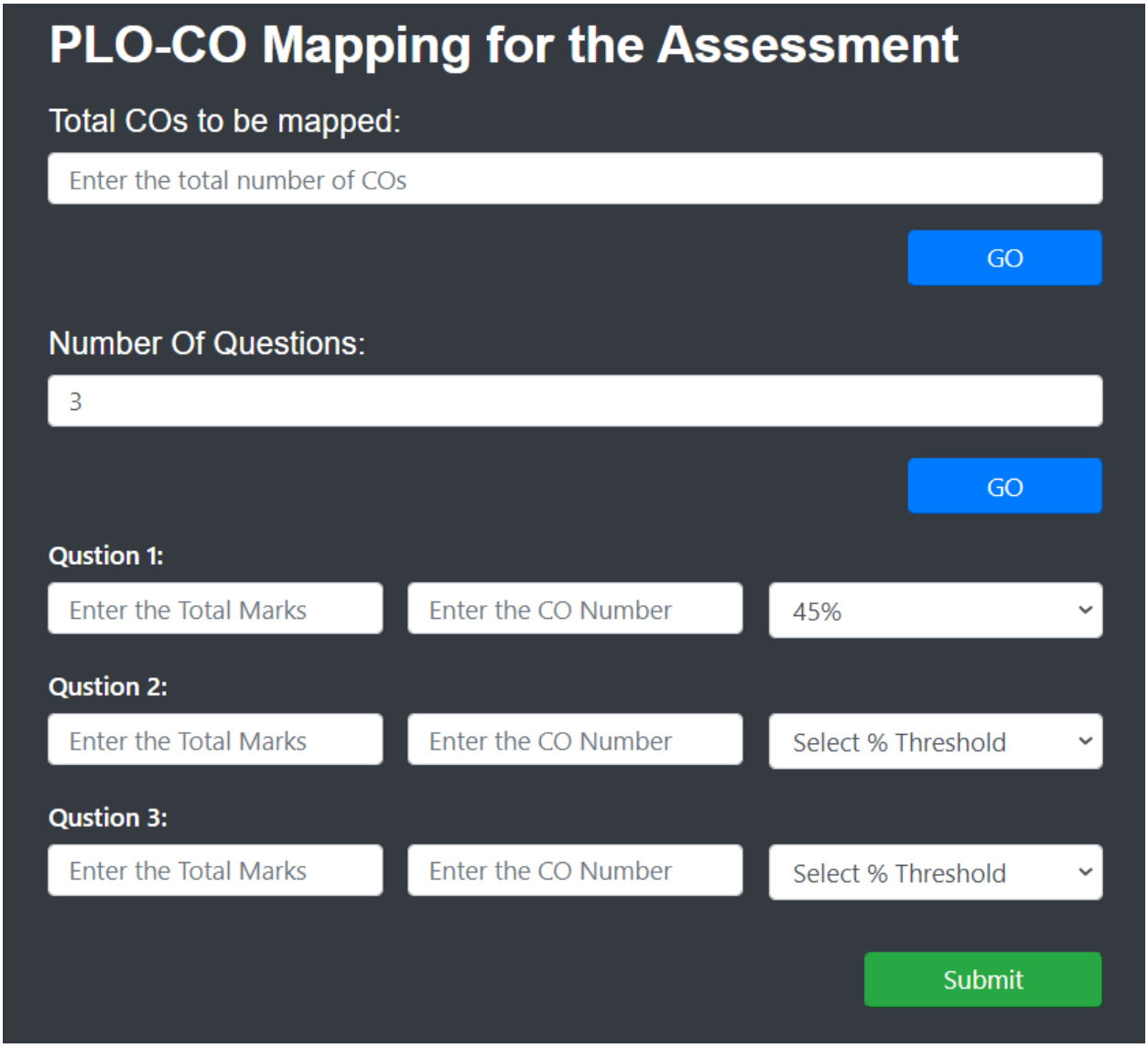
- **INPUT FORMS**
- **OUTPUT VIEWS**

Input form: Assessment Details



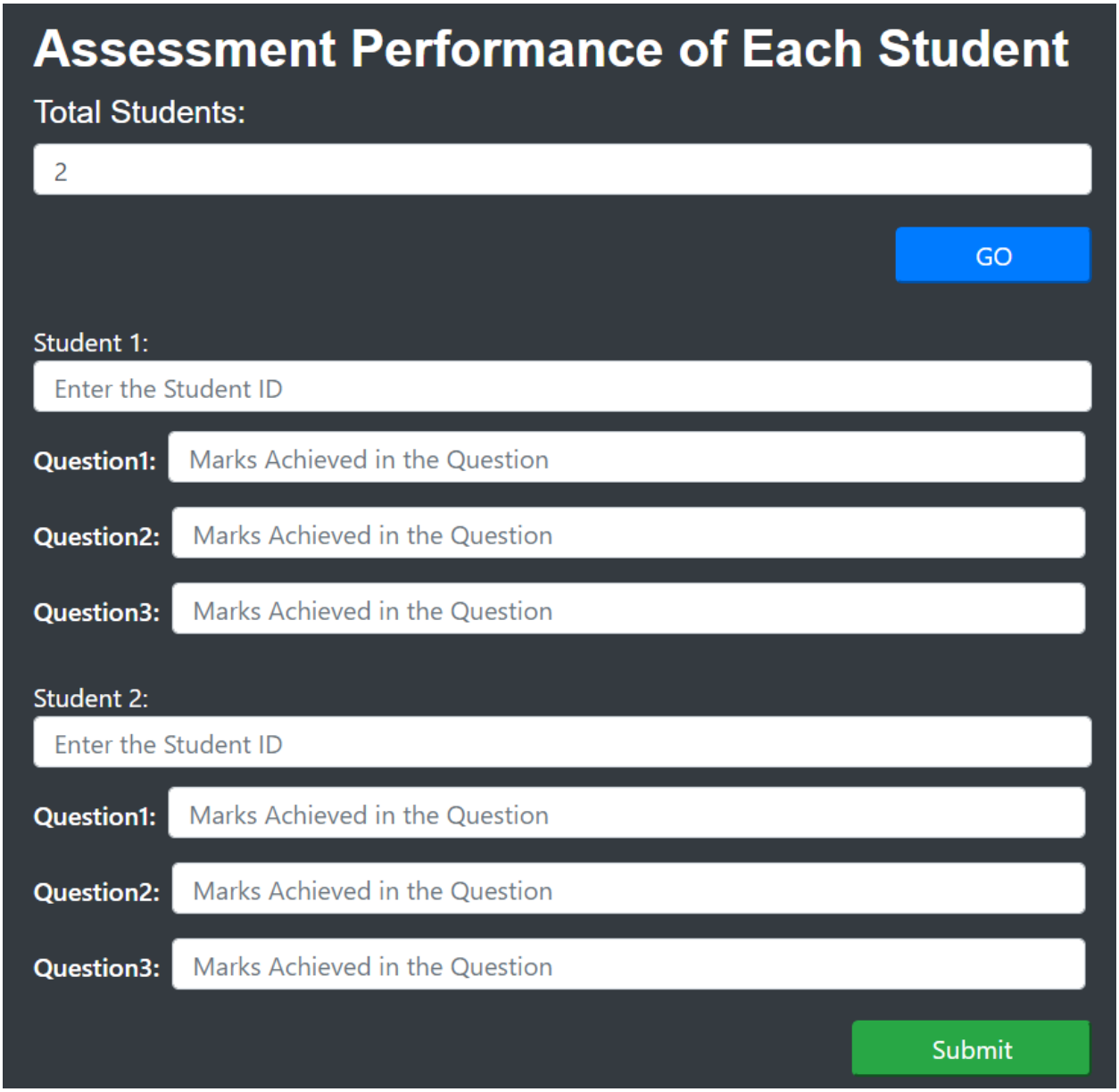
This is a faculty only screen. It allows the faculty to choose the following course and section along with determining the type of assessment. For ex. Final, Midterm or Quiz.

Input form: PLO-CO mapping for the assessment



Here the faculty gets to enter the total number of CO's along with the total number questions which will then generate a form for the faculty to input total marks for each question, associated CO number for each question and the percentage threshold.

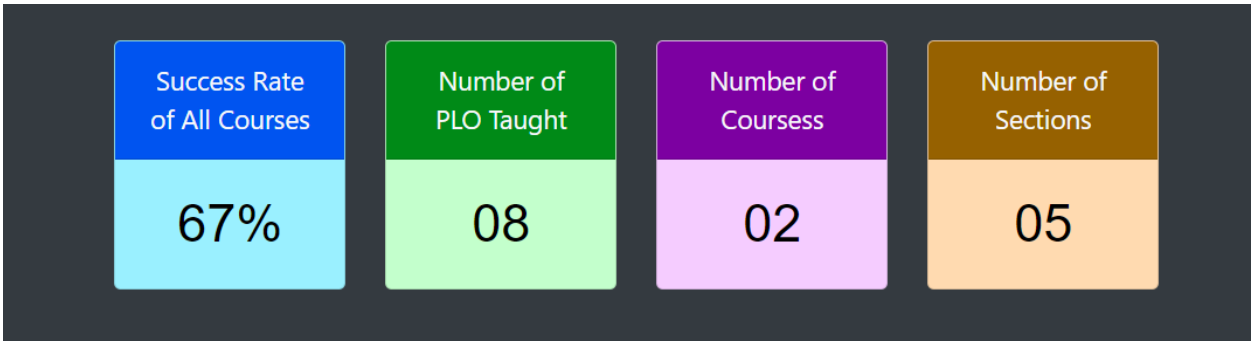
Input form: Assessment performance of each student



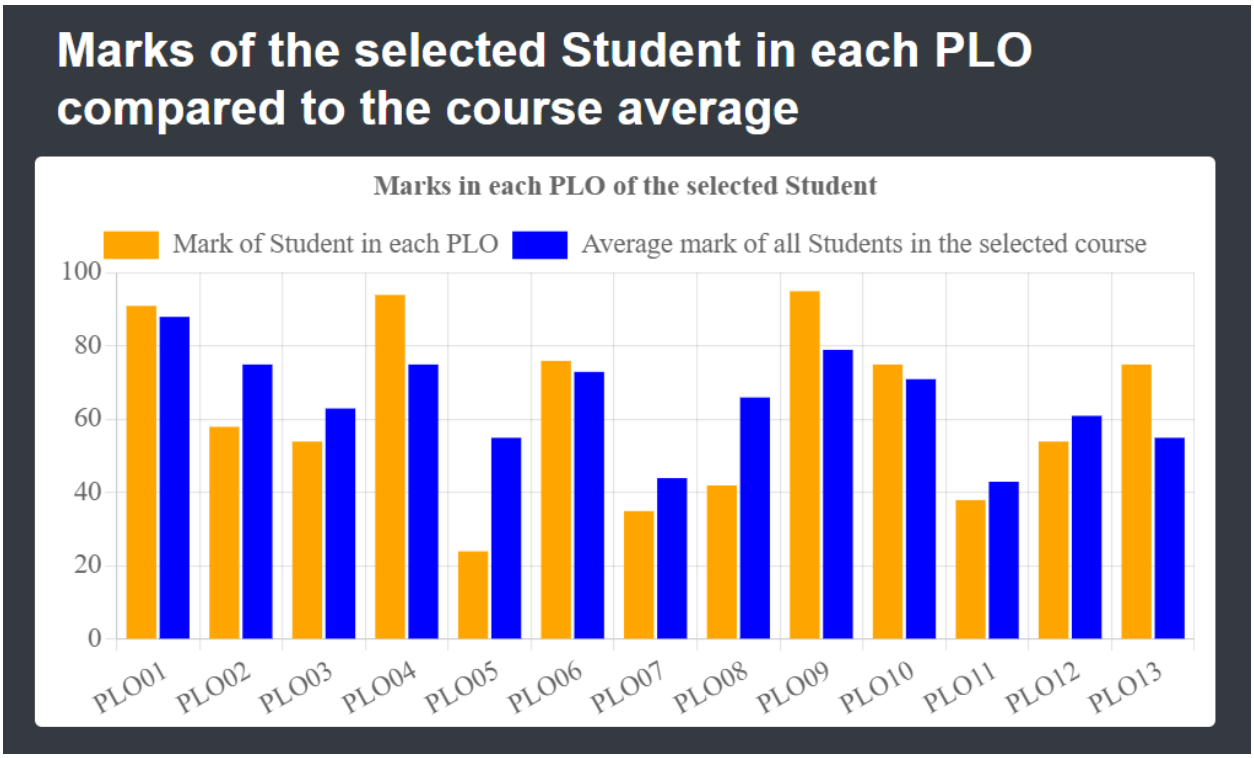
Here the faculty inputs the number of total students to be assessed. After selecting "go" , inputs for all the students gets generated automatically.

OUTPUT VIEWS

Faculty Dashboard:

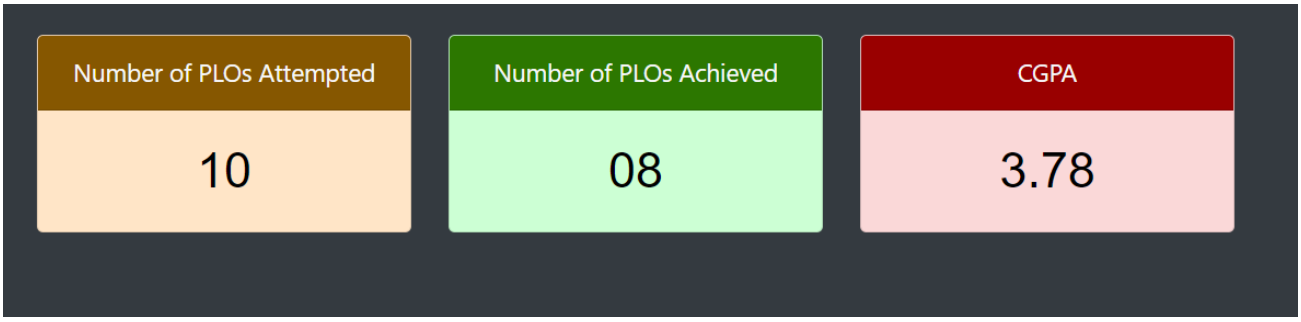


Student Wise PLO ANALYSIS:



```
SELECT AVG(TotalPlo.PLOpercentage) AS ActualPlo
                FROM (
                SELECT (PLO / TotalComark * 100) AS PLOpercentage
                FROM (
                        SELECT SUM(DISTINCT e.obtainedMarks) AS PLO, SUM(DISTINCT
a.marks) AS TotalCoMark
                        FROM performance_monitor_enrollment_t en,
                            performance_monitor_evaluation_t e,
                            performance_monitor_assessment_t a,
                            performance_monitor_co_t c,
                            performance_monitor_plo_t p
                        WHERE en.student_id = '{}'
                            AND en.enrollmentID = e.enrollment_id
                            AND e.assessment_id = a.assessmentNo
                            AND a.co_id = c.coID
                            AND c.plo_id = '{}'
                        GROUP BY en.section_id
                    ) ploPer
                ) TotalPlo;
```

Student Dashboard:

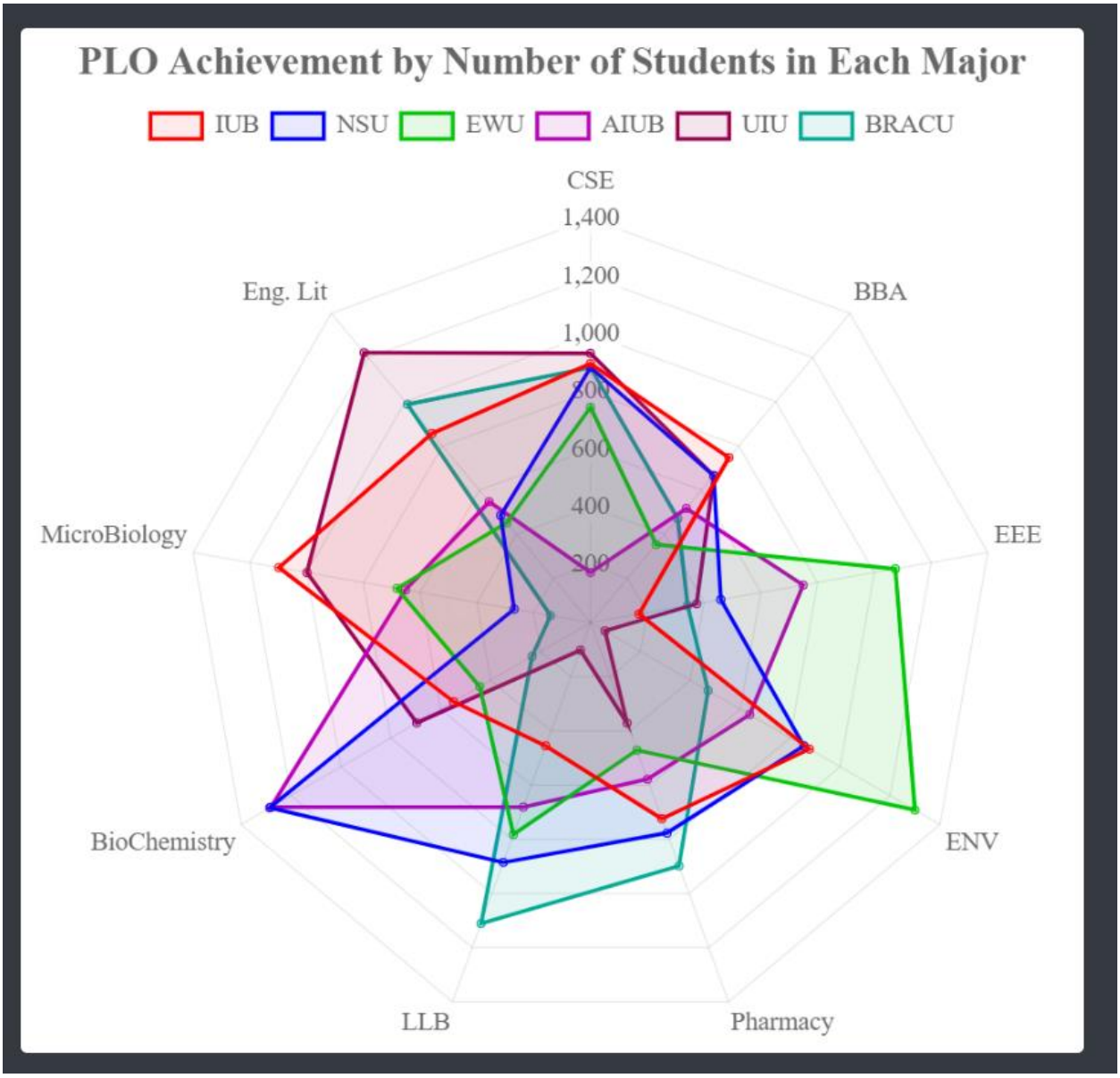


Student-Wise PLO Achievement Table:

Performance in each PLO

PLOs		Courses		
		CSE101	CSE203	CSE303
PLO1	Acheivement Status	Achieved	Achieved	Failed
	Percentage Achieved	89	75	33
PLO2	Acheivement Status	Achieved	Failed	Achieved
	Percentage Achieved	88	41	77
PLO3	Acheivement Status	Failed	Failed	Achieved
	Percentage Achieved	15	44	96
PLO4	Acheivement Status	Achieved	Achieved	Achieved
	Percentage Achieved	78	85	93
PLO5	Acheivement Status	Achieved	Failed	Failed
	Percentage Achieved	87	42	27
PLO6	Acheivement Status	Failed	Failed	Failed
	Percentage Achieved	24	45	39
PLO7	Acheivement Status	Failed	Achieved	Achieved
	Percentage Achieved	11	67	76
PLO8	Acheivement Status	N/A	N/A	N/A
	Percentage Achieved	N/A	N/A	N/A
PLO9	Acheivement Status	Failed	Failed	Achieved
	Percentage Achieved	33	09	65
PLO10	Acheivement Status	Achieved	Achieved	Achieved
	Percentage Achieved	66	85	77
PLO11	Acheivement Status	N/A	N/A	N/A
	Percentage Achieved	N/A	N/A	N/A
PLO12	Acheivement Status	Achieved	Failed	Failed

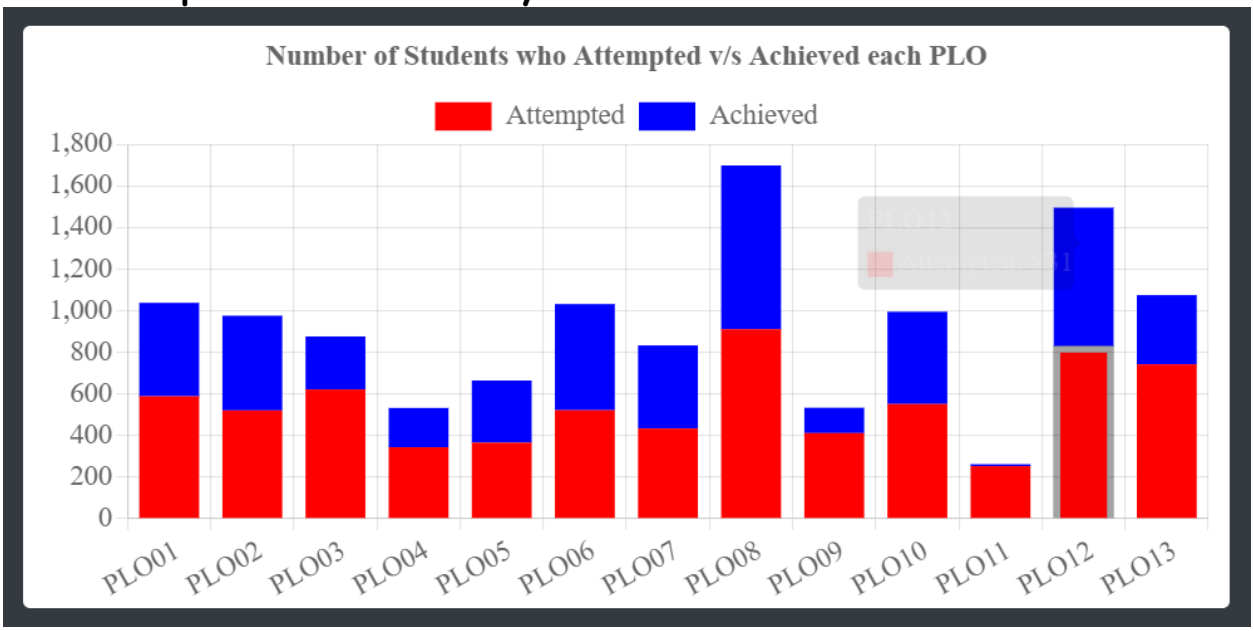
University Wise PLO ANALYSIS:




```
                SELECT AVG(TotalPlo.PLOpercentage) AS ActualPlo
                FROM (
                    SELECT (PLO / TotalComark * 100) AS PLOpercentage
                        FROM (
                            SELECT SUM(e.obtainedMarks) AS PLO, SUM(a.marks) AS
TotalCoMark
                            FROM performance_monitor_enrollment_t en,
```

```
                performance_monitor_evaluation_t e,
                performance_monitor_assessment_t a,
                performance_monitor_co_t c,
                performance_monitor_plo_t p,
                performance_monitor_student_t st
            WHERE st.department_id = '{}'
            AND st.studentID = en.student_id
            AND en.enrollmentID = e.enrollment-id
            AND e.assessmentID = a.assessmentNo
            AND a.coID = c.coID
            AND c.ploID = '{}'
            GROUP BY en.sectionID
        ) ploPer
    ) TotalPlo;
```

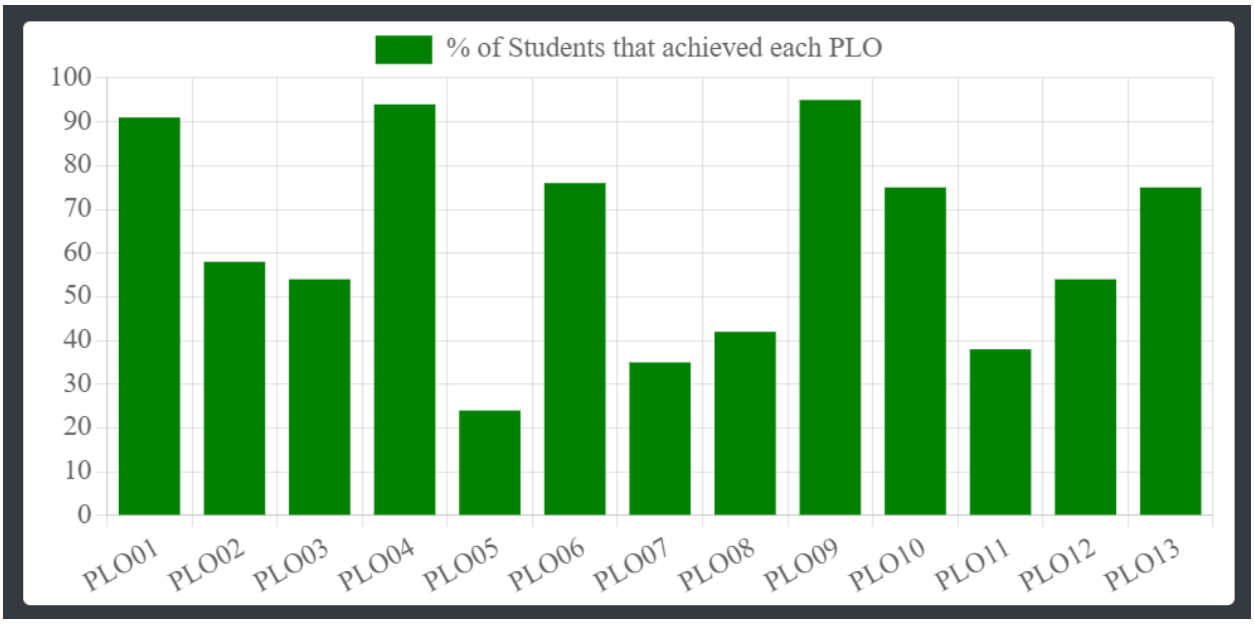
PLO attempted VS Achieved By Students:



```
SELECT COUNT(TotalPlo.PLOpercentage) AS Acheive
          FROM (
                SELECT   studentID,(PLO / TotalComark * 100) AS PLOpercentage
                FROM performance_monitor_plo_t p,
                     performance_monitor_co_t c,
                    (
                       SELECT en.studentID,c.plo_id,SUM(DISTINCT e.obtainedMarks)
AS PLO,SUM(DISTINCT a.marks)AS TotalCoMark
                       FROM performance_monitor_enrollment_t en,
                           performance_monitor_evaluation_t e,
                           performance_monitor_assessment_t a,
                           performance_monitor_co_t c,
                           performance_monitor_plo_t p,
                           performance_monitor_section_t s
                       WHERE en.studentID = '{}'
                       AND en.enrollmentID = e.enrollment_id
                           AND e.assessmentID = a.assessmentNo
                           AND a.coID = c.co_id
                           AND c.ploID = p.ploNo
                       GROUP BY  studentID,p.ploNo
                    ) ploPer
                WHERE p.ploNo =  ploPer.ploID

             GROUP BY studentID,ploNo
             HAVING PLOpercentage >=40
             ) TotalPlo

          GROUP BY studentID
```

```
SELECT COUNT(TotalPlo.PLOpercentage) AS Acheive
          FROM (
                SELECT   studentID,(PLO / TotalComark * 100) AS PLOpercentage
                FROM performance_monitor_plo_t p,
                    performance_monitor_co_t c,
                    (
                        SELECT en.studentID,c.plo_id,SUM(DISTINCT e.obtainedMarks)
AS PLO,SUM(DISTINCT a.marks)AS TotalCoMark
                        FROM performance_monitor_enrollment_t en,
                            performance_monitor_evaluation_t e,
                            performance_monitor_assessment_t a,
                            performance_monitor_co_t c,
                            performance_monitor_plo_t p,
                            performance_monitor_section_t s
                        WHERE en.student_id = '{}'
                        AND en.enrollmentID = e.enrollment_id
                            AND e.assessmentID = a.assessmentNo
                            AND a.coID = c.coID
                            AND c.ploID = p.ploNo
                        GROUP BY  studentID,p.ploNo
                    ) ploPer
                WHERE p.ploNo =  ploPer.ploID

            GROUP BY studentID,ploNo

            ) TotalPlo
```

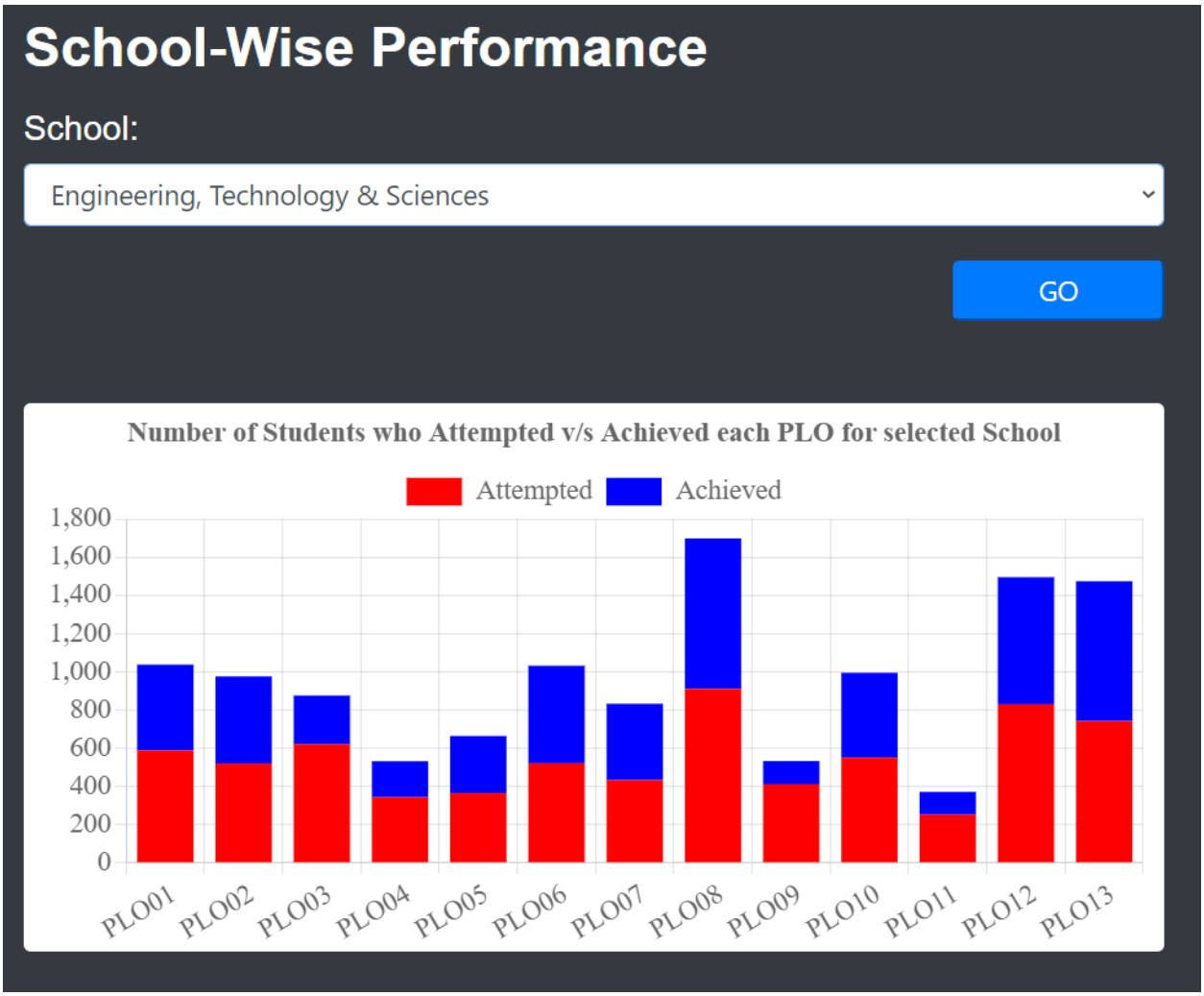
COURSE WISE PLO ANALYSIS:




```
SELECT DISTINCT co.course_id, co.coNo, p.ploNo, (PLO / TotalComark * 100) AS
PLOpercentage

FROM Performance_monitor_plo_t p, mainapp_co_t co, (
SELECT DISTINCT c.course_id,c.coNo, c.plo_id, SUM(DISTINCT

e.obtainedMarks) AS PLO, SUM(DISTINCT a.marks) AS TotalCoMark

                    FROM Performance_monitor_enrollment_t en,
                     Performance_monitor_evaluation_t e,
                     Performance_monitor_assessment_t a,
                     Performance_monitor_co_t c,
                     Performance_monitor_plo_t p
                     GROUP BY en.section_id,c.plo_id
                        ORDER BY c.plo_id
                    ) ploPer
                           WHERE co.coNo = ploPer.coNo
```

```
AND p.ploNo = ploPer.plo_id
AND co.course_id = ploPer.course_id;
```

School-wise number of students attempted v/s achieved for each PLO:



CHAPTER 5

CONCLUSION

- **PROBLEM AND SOLUTION**
- **ADDITIONAL FEATURES & FUTURE DEVELOPMENT**
- **CONCLUSION & RECOMMENDATIONS**

PROBLEM AND SOLUTION

- The limited amount of mark sheets and information provided on students and faculties, we had to limit a lot of our calculations and work. If provided with more resources and data to work with, we believe we could have achieved a much reliable and accurate result, representation and prediction.

- The bounded timeframe of the semester has stalled our ability to achieve the full potential of this software. We believe we have created the best possible software from the limited resources and time provided, and hope to come up with improvements with better analysis when allowed more time.

ADDITIONAL FEATURES AND FUTURE DEVELOPMENT:

- The addition of an assessment page where faculties will be able to add marks for a specific assessment and fix the threshold for each question of a student throughout the term.

- Users will be expanded to also include advisors, where advisors will get relevant information about the students they're advising for improved and more beneficial interactions between students and advisors.

- The addition of Curriculum Page in the SPM where members of the Higher Management team can add and edit any changes to curriculum. Moreover, faculty members and students can check these updates to stay informed about the latest changes.

CONCLUSION AND RECOMMENDATIONS:

We believe that we have designed, built and implemented the best possible version of the idea we had for our SPM software. Through the proper usage of this software, we are hopeful to achieve a drastically improved quality of education that universities provide. This software is serviceable to students who want to improve themselves as better and more competent scholars, for faculties to keep better track of their students and improve their teaching methods accordingly, and for the members of the institution to better regulate their resources.