Student Performance Monitor

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CSE303

Database Management System

REPORT 2

Group 02

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CHAPTER 1

INTRODUCTION

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- OBJECTIVE OF THE PROJECT
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BACKGROUND OF THE PROJECT

The academic process of higher education must achieve something that improves the learning process. To make this happen, universities must monitor and evaluate the results of the teaching process by looking at student performance. We are going to design, create and deliver software that will help universities promote a more productive and effective way to assess students everywhere and that is the goal of our project. Performance monitoring includes assessments that play an important role in providing students, teachers, administrators, and policymakers with the information they need to make decisions. If we talk about the main part of our project, here is the concept of Course Outcome (CO) and Program Learning Outcomes (PLO), each CO is mapped to a PLO, and through each PLO students are expected to learn from the course 'problem analysis, design, Skill implementation, etc. 'will be known. The system allows input from IEB to determine PLO requirements. The project will evaluate to see if the COS mapped PLOs are met for each student to assess student proficiency. Faculties then input COs for each of their students so that the system can map the COs to the PLO accordingly. PLOs are carefully and specially selected to ensure that students achieve the most in a course so that students can monitor their progress in each sector and pinpoint the areas where self-improvement and self-development are needed. We are hopeful that our software will help institutional students' progress, departmental performance and assist in the distribution and allocation of their improved resources.

OBJECTIVE OF THE PROJECT

Student progress monitoring is a practice that helps teachers continually evaluate the effectiveness of their learning and use student performance data to make more significant instructional decisions. If the rate at which a particular student is learning seems inadequate, the teacher can adjust the instruction. Our project seeks to create user-friendly software that will serve as a platform for many to improve the quality of education of students, faculty, and other members of the university and in advanced technology in the field of education. We believe that the information we have collected, evaluated, and equipped will lead to opportunities for greater advances in our education and will also make a significant contribution to computer science.

SCOPE OF THE PROJECT

This CHAPTER will discuss falls within the scope of the system. To recognize the importance or quality of the scope, we are to contemplate what the system will accomplish i.e. The purpose of the system and the desired requirements that are to be met.

The main purpose of implementing such a system is to improve and digitalize the old inefficient way. In the exciting system, there exists several human roles (e.g., faculty, students) that are to get the work done manually, not by computers. Therefore, the existing system takes more time to achieve the goals while compared to the newly proposed system. The new system accomplishes this by reducing the human roles of the system and making a computer which helps us to run the system and do the work of organizing, storing and instantly querying the essential data.

- Storing useful data
- Securing the data by restricting access to the system.
- Instantly insert/ update/ delete data from the database
- Generate dynamic charts from the data using defined or dynamic parameters.
- Reporting
- Project management

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

RICH PICTURE (AS-IS)

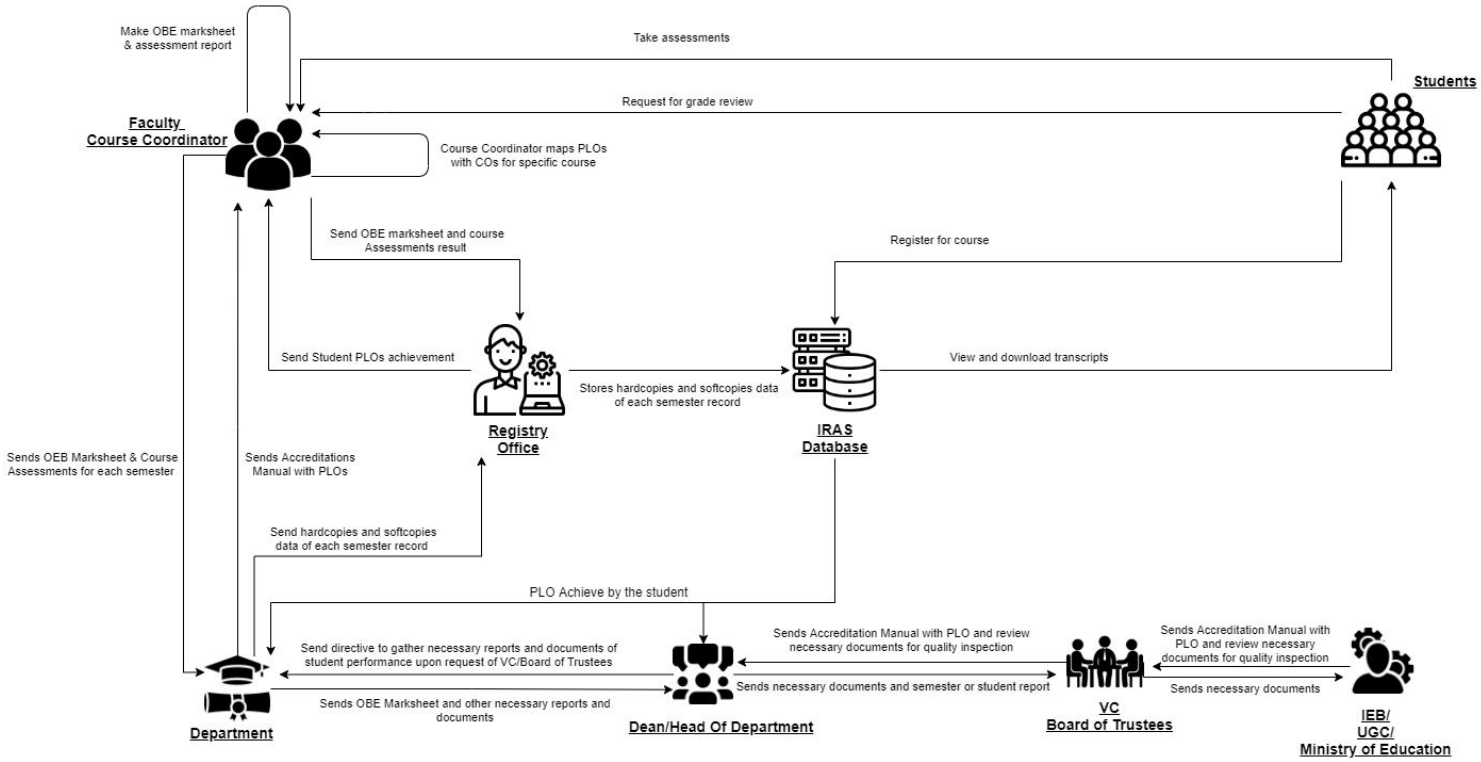


Figure 2.1: Rich Picture (As-Is)

SIX ELEMENTS (AS-IS)

Process	System Roles					
	Human	**Non-Comp Hardware**	**Computing Hardware**	**Software**	**Database**	**Network & Communication**
Map Course Outcomes (COs) to Program Learning Outcomes (PLOs)	**IEB/UGC/ Ministry of Education:** 1. Send Accreditation Manual with PLOs defined to VC/ Board Of trusties. **VC/ Board Of trusties** 1. Receive Accreditation Manual from IEB. 2. Send the Accreditation manual to Department Staff. **Head of Department / Dean of School:** 1. Send the Accreditation manual to Department Staff. 2. Direct Department Staff to tell Course Instructors and Coordinators to design Course Outline and Course Assessment Reports. **Department:** 1. Send Course Instructors the Accreditation Manual with defined PLOs. **Course Instructor:** 1.Check if previous	**Pen and paper:** 1. Is used for noting down intermediate brainstorming ideas. **Board and marker:** 1. Is used for noting down intermediate brainstorming ideas.	**Computer:** 1. Course Coordinators use computers to make softcopies of Course Outcomes (COs) of the specific courses they are experts in. **Printer:** 1. To print out hardcopies of Course Outcomes (COs).	**MS Word:** 1. Course Coordinators use MS Word to make a detailed course outline and Course Assessment Reports with Course Outcomes (COs) mapping to Program Learning Outcomes (PLOs). **Excel Sheet:** 1. Excel Sheet is used by Course Coordinators to map specific questions in the Midterm, Final exams and Project work to specific Course Outcomes (COs).	**IRAS Database server:** 1. IRAS uses a database server to store and maintain student grades' information.	1. Use the internet and emails to communicate with UGC/IEB or other stakeholders to discuss important topics related to mapping Course Outcomes to Program Learning Outcomes. **Others:** 1. Use phones or physical means with stakeholders to discuss important topics related to mapping Course Outcomes to Program Learning Outcomes.

	course content is present form register office, otherwise make new course content. 2. List COs. 3. Map Course Content to Course Outcomes (COs). 4. Map COs to PLOs. 5. Map COs to specific questions of Mid-term, Final Exams questions and Project Work. 6. Starting to design course assessment report using course outline, Course Content and COs. **Register Office:** 1.Send course content to course instructor if available otherwise send negative message.					
Check Number of student enrollment in a department	**Student:** 1. Student enroll in a specific Degree program. 2. Student information is sent to register's office. **Register Office:**	**Pen and Paper** 1. Sheet of number of students in a department is made along with student's information.	**Computer/ Phone:** 1. Uses computers to make softcopies of report or sheet of student information in departments.	**Coded Excel sheet:** 1.Department head or dean uses automated excel sheets to calculate the number	**Department Storage:** 1. Records of students' enrollment in the department.	**Internet/Mail:** **1.** An Online platform (such as Google Sheets) may be used for processing the student information data spreadsheet.

	1.Gather all the new student's information. 2. Assign the data in sheet of student information of designated departments. 3.Send the new update data to each department. **Department:** 1.Recieve the data of new student. 2.Update it in the existing database 3. Send the data to department heads or deans for further inspection **Department Head/Dean:** 1.Recieve the data from department. 2.Make calculation of number of new student enrollment comparing to previous cases. 3. Make calculation number of categorize students, such as merit base, physical aid and others		**Printer:** 1. Print hardcopies of report and sheet	student's in the departme nt. **MS Word:** 1. Used to make report softcopie s.	**Registr ar's Office Storage :** 1. Records of students ' enrollme nt for all the departm ents.	
Register for course	**Student:** 1. Login to IRAS 2. Student enroll in specific courses if all the pre requisite	**Pen and Paper** 1. Sheet of number of students enrolled for the course.	**Computer/ Phone:** 1. Uses computers to make softcopies of report or sheet of	**Coded Excel sheet:** 1.Instruct or uses automate d excel sheets for the	**Depart ment Storage :** 1. Records of students '	**Internet/Mail:** **1.** An Online platform (such as Google Sheets) may be used for processing the student

	courses are completed otherwise can't process end. 3. Request for bill 4. Receive for bill 5. Pay the bill **Register Office:** 1.Store request asked by the student and send the billing date 2. Receive billing data 3. If bill paid stored data is updated to database otherwise process end and student had to drop the course. 4. Send student information to Department. **Department:** 1.Recieve the data of enroll student. 2. Send the data of enroll student to course instructor. **Instructor** 1. Receive data of enrolled student. 2. Allocate space for the new student data in OEB marksheet.		student information enrolled for the course. **Printer:** 1. Print hardcopies of report and sheet	semester OEB marksheet. **MS Word:** 1. Used to make report softcopies.	enrollment in the course. **Registrar's Office Storage:** 1. Records of students' enrollment in the course.	information data spreadsheet.
Record Student Assessment Data	**Faculty/ Course Coordinator:** 1. Assign project work and	**Pen & Paper:** 1. Use pen & paper to record	**Computer:** 1. Creating softcopies of records of all assessment	**Excel Sheet:** 1. Record necessary	**Department Storage:** 1. Records	**Internet:** 1. The Internet is used to communicate with IRAS to store final

	assignments according to course outline. 2. Take quizzes and exams throughout the semester according to course outline. 3. Record assessment data of students throughout the semester of each student for every assessment (quizzes, assignments, project, exams) on softcopies and hardcopies. 4. Record marks for each specific question in the midterms and final exams. 5. Calculate total marks of quizzes, assignments and midterm and final exams and assign final grades to each student of specific courses. 6. Convert finals and midterms marks. 7. Bring all the marks of every student for a course into a Marksheet. 8. Grade the student	assessment data and marks obtained on physical paper in tabular format(hardcopies).	data for specific courses are done on computers.	assessment data and final grades on Excel Sheets. **IRAS:** 1. Upload students' final grades to IRAS for viewing by students or the registrar's office.	of students' assessment data and final grades may be saved in the department office and registrar's office for future reference. **IRAS Database server:** 1. IRAS uses a database server to store and maintain student grades' information.	grades of students.

	according to current mark distribution if no change is needed else adjustment has been made. 9. Upload students' final grades on IRAS. 10. Send the Marksheet to the Department. 11. Send the Marksheet to admin to store in the database					
Produce OBE Marksheet & Course Assessment Report	**Faculty:** 1. Calculate total marks received for each CO by calculating the marks received for questions and/or other assessments mapped to COs. 2. Calculate total percentages received for each COs on the OBE Marksheet. 3. Declare if a student has achieved a specific CO (if CO percentage is greater than or equal to 40). 4. Declare if a student has received a PLO for a related CO. 5. Make a table giving the verdict and analysis of	**Pen and Paper** 1. OBE marksheet stored in hardcopy. Additional markings may be made to further separate between students.	**Computer/ Phone:** 1. Uses computers to make softcopies of the OBE Marksheet and Course Assessment Reports. **Printer:** 1. Print hardcopies of final versions of the OBE Marksheets and Course Assessment Reports.	**Coded Excel sheet:** 1.Faculty /Course Coordinator uses automated excel sheets to calculate the student's success/ failure in achieving PLOs. **MS Word:** 1. Used to make Course Assessment Report softcopies.	**Department Storage:** 1. Records of students' assessment data and final grades will be saved in the department for future reference. **Registrar's Office Storage:** 1. OBE Marksheets, Course Assessment Reports and other documents submitte	**Internet/Mail:** **1.** An Online platform (such as Google Sheets) may be used for processing the OBE assessment data spreadsheet.

	how many students were able to receive a certain CO and PLO and other documents containing necessary information and data. 6. Design Course Assessment Report using Course Outline, Course Content and Course Outcomes. 7. Send the final version of the OBE Marksheet to the Dept. Office. **Department Office:** 1. Send the OBE marksheet, Course Assessment Report and others to the Registrar's Office. 2. Store the OBE Marksheet and Course Assessment Report in the department. **Registry Office:** 1. Stores the OBE Marksheet and Course Assessment Reports and other documents and reports in the				d by the departm ent is stored for future referenc e.	

	Registrar's Office.					
View grades and download Transcripts	**Students**: 1. Log into IRAS. 2. Search semester wise result for intended semester. 3. See grades for specific semesters. 4. Download transcript through browser into hard disk. **Dean/DOH:** 1. Log into IRAS. 2. Search semester wise result for intended semester for a specific student. 3. See grades for specific semesters. 4. Download transcript through browser into hard disk. **Faculty/Higher Officials:** 1. Request register office for transcript of particular student or semester of a particular course. 2. Receive transcript of particular student or semester of a particular course. **Registry Office:** 1. Access IRAS.	**Pen and Paper** 1. Tabulated transcripts may be printed onto paper. Hardcopy is used as the primary source of truth during applications and other paperwork.	**Computer/ Phone:** 1. Used for accessing IRAS. **Printer:** 1. Used to print the tabulated transcript. Prints tabulated transcripts.	**IRAS:** 1. **Store's** letter grades of each completed course 2. Provides the online user **interface** for viewing grades and transcripts.	**Registrar's Office Storage:** 1. Student information is kept in admin in hardcopies for future reference. **IRAS Database Server:** 1. A Database Management Service is used to store, maintain, edit and receive student grades information in IRAS. **Web Server:** 1. User interface and website pages are served using a remote web server.	**Internet/ Email** 1. The **Internet** is used to communicate with IRAS to store final grades of students. 2. Softcopies may be **mailed**.

	2. View students' grades if and when it's necessary. 3. Download their transcripts. 4. Send transcript					
View Records OBE Marksheets, Course Assessment Reports over a time period for inspection and analysis of student performance trend	**IEB/ UGC:** 1. Inform the VC of a deadline within which OBE Marksheets, Course Assessment Reports and other documents are needed for quality inspection to make necessary improvements to degree programs. 2. Inform the university head if govt. official will visit the campus. 3. Visit university and relevant depts to receive the necessary documents and reports. **Head of Dept/Dean of School:** 1. Request to view records of OBE Marksheets, Assessment Reports to analyze students' performance trends. 2. Direct Department	**Pen and Paper:** 1. May be used for noting/marking down key points of the report. 2. Hardcopies of reports may be used.	**Computer:** 1. Used to display OBE Marksheet and Course Assessment Report softcopies. 2. Send OBE and Course Assessment Reports to other computers.		**Department Records** 1. Retrieval of OBE marksheets and Course Assessment reports when needed. 2. Stores records on stakeholders' interpretation of student performance trends.	**The internet:** 1. OBE marksheets and course assessment reports may be **mailed** online. 2. Online platforms such as Google Docs/Sheets display reports of softcopies.

	Staff to gather necessary documents, OBE Marksheets, Assessment report for a given time-period specified by govt. officials. 3. Receive the necessary documents gathered by the dept. 4. Evaluate the need to change/ improve the department's educational resources based on students' performance trends. **VC/Board of Trustees:** 1. Request to view records of OBE Marksheets, Assessment Reports to analyze students' performance trends. **Departmental :** 1. Gather necessary OBE Marksheets, Assessment Reports & other documents. 2. Provide all the necessary documents to govt. officials. **Faculty/Higher Officials:** 1. Request register office					

	for OBE marksheet semester of a particular course. 2. Receive OBE marksheet semester of a particular course. **Registry Office:** 1. Access IRAS. 2. Gather OBE marksheet from database. 3. Send OBE marksheet.					
Request for review and change of grades	**Students:** 1. Request for grade change and review to faculty. **Faculty/ Course Coordinator:** 1. Check exam papers and other assessments upon request. 2. If change needs to be made, send a grade change request of a specific student to register office. If not, end the process. **Register Office:** 1. Receive a request to change the grade of a specific student. 2. Change grade of student based on Faculty	**Pen and Paper:** 1. May be used to note down key points or marks on the students' answer sheets.	**Computer/ Phone:** 1. Used for communicating with the faculty.	**IRAS**: 1. Used by the admin for changing the grade.	**IRAS server:** 1. Update student grade data. **Department Storage:** 1. Update student grade data. **Registrar's Office Storage:** 1. Update student grade data.	**Internet:** 1. Email is primarily used for communication. **Phone:** 1. May be used for communication.

	request.					

PROCESS DIAGRAM (AS-IS)

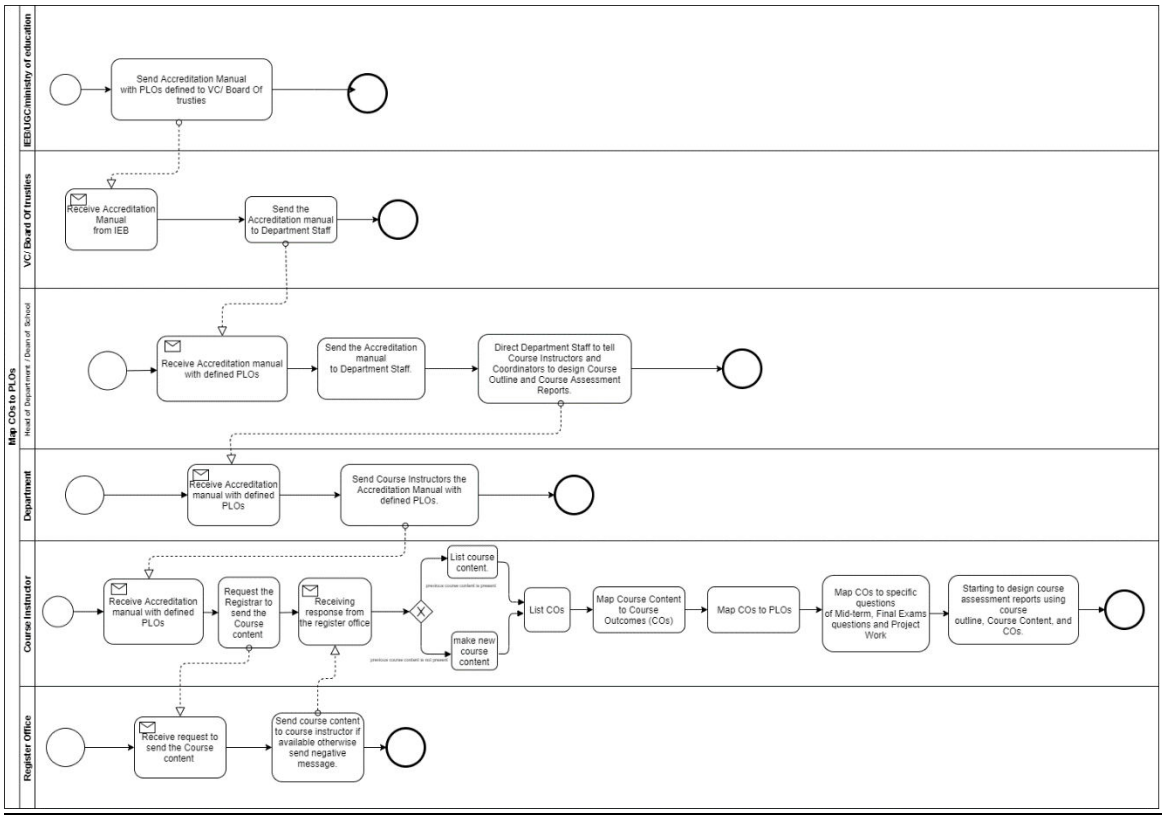


Figure 2.3: Process Diagram for Map COs to PLOs

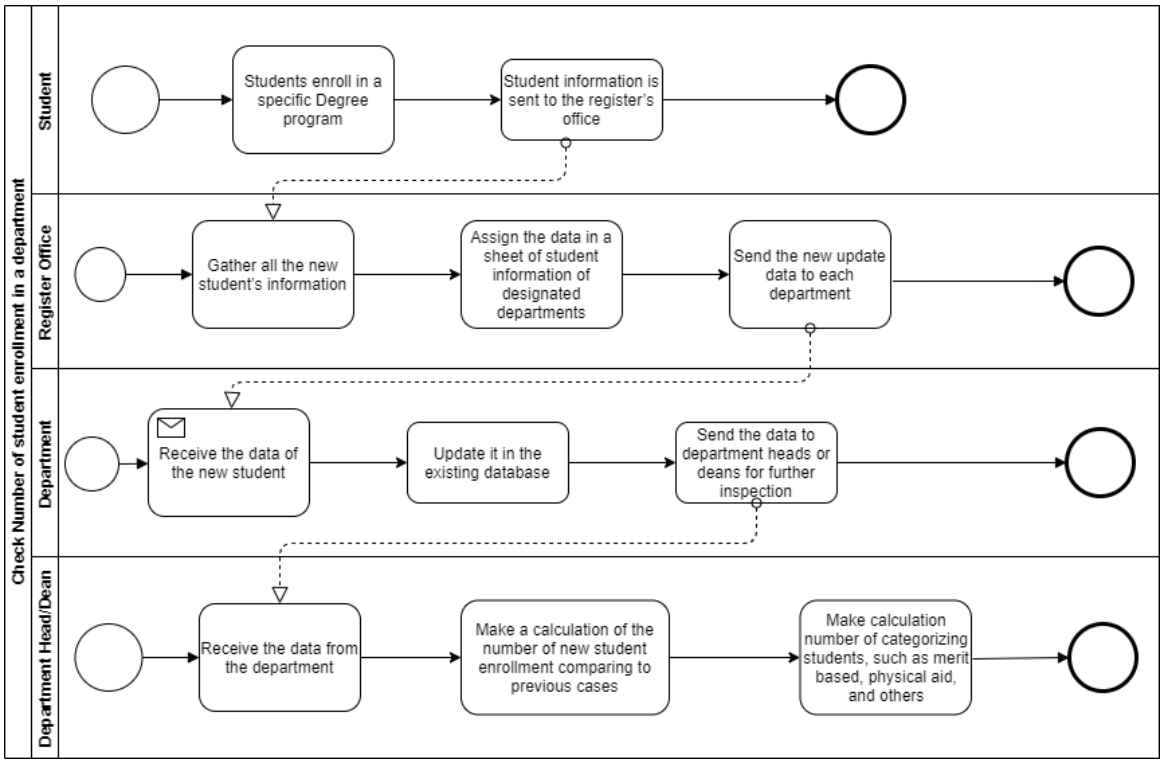


Figure 2.4: Process Diagram for Check Number of student enrollment in a department

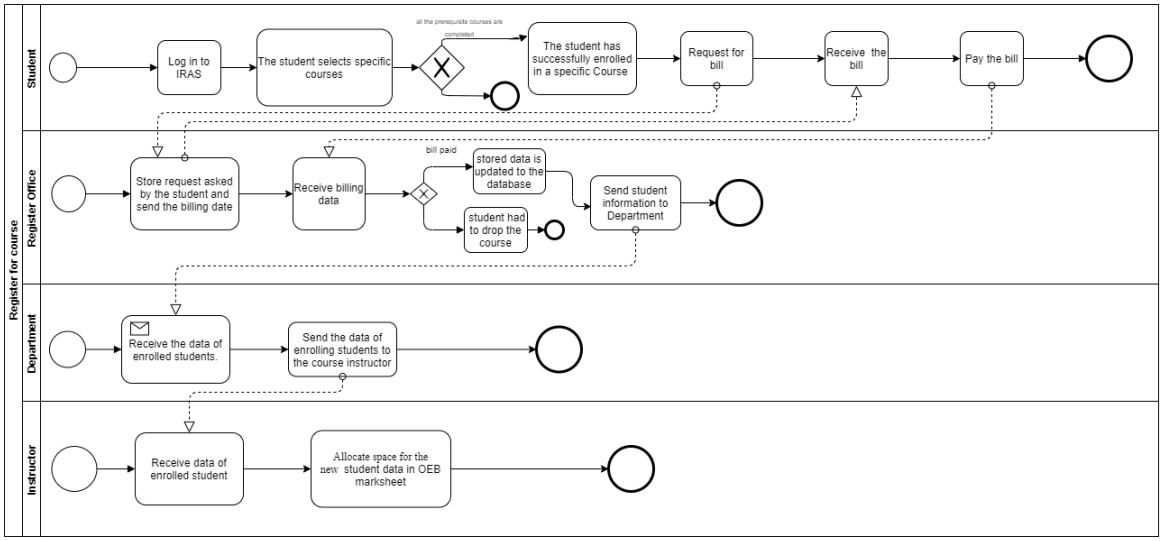


Figure 2.5: Process Diagram for Register for course

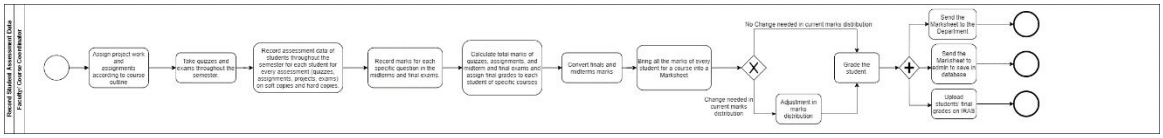


Figure 2.6: Process Diagram for Record Student Assessment Data

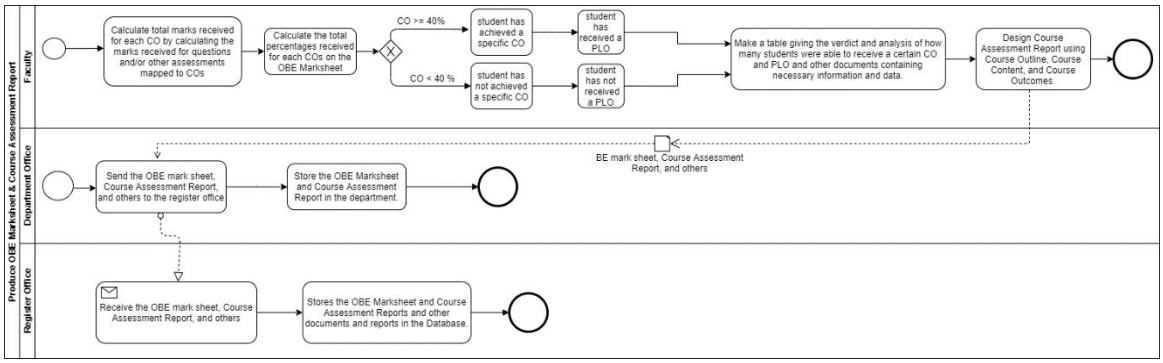


Figure 2.7: Process Diagram for Produce OBE Marksheet & Course Assessment Report

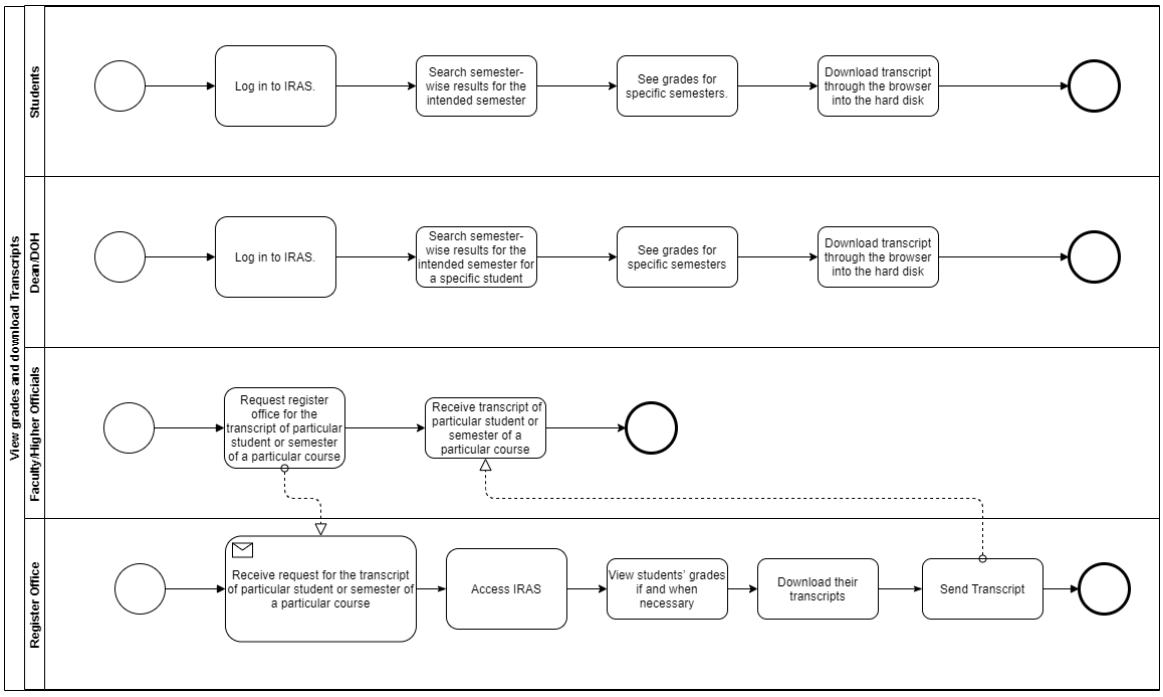


Figure 2.8: Process Diagram for View grades and download Transcripts

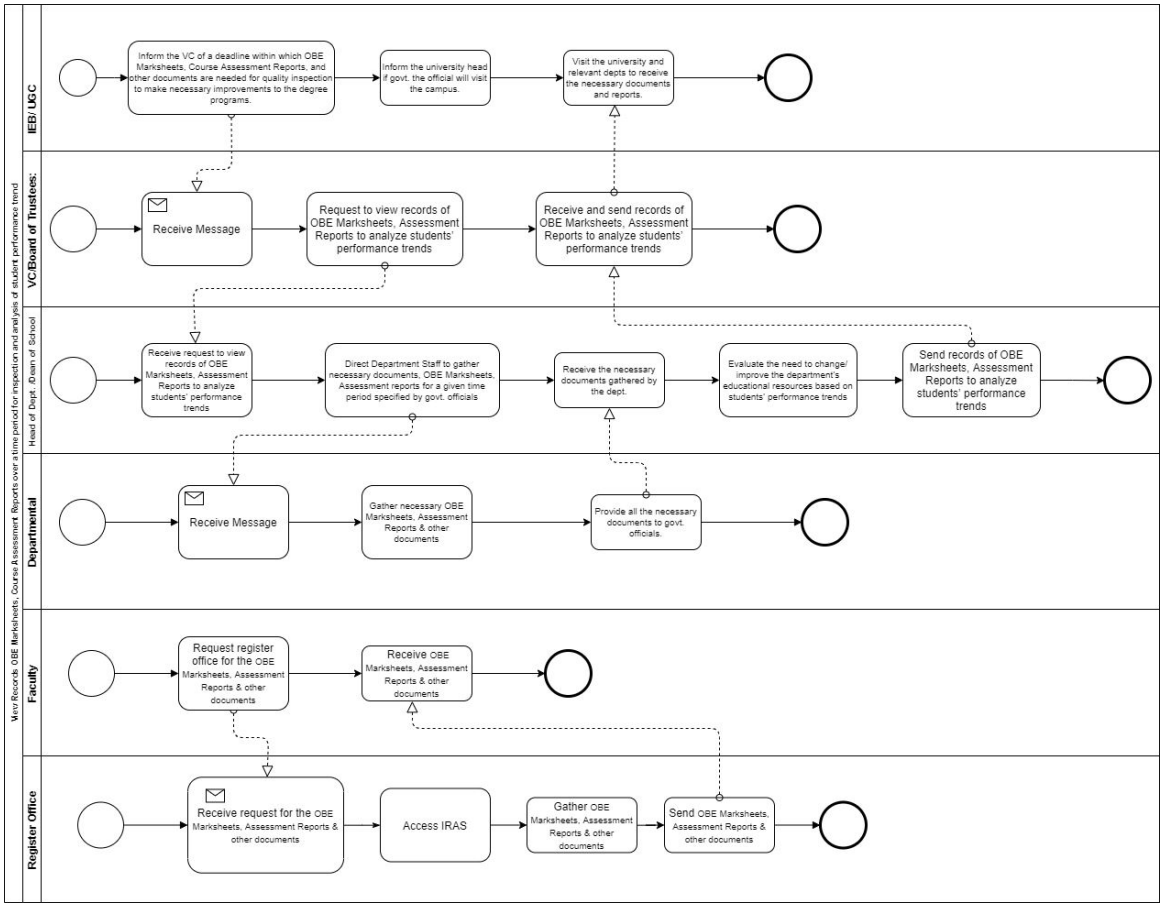


Figure 2.9: Process Diagram for View Records OBE Marksheets, Course Assessment Reports over a time period for inspection and analysis of student performance trend

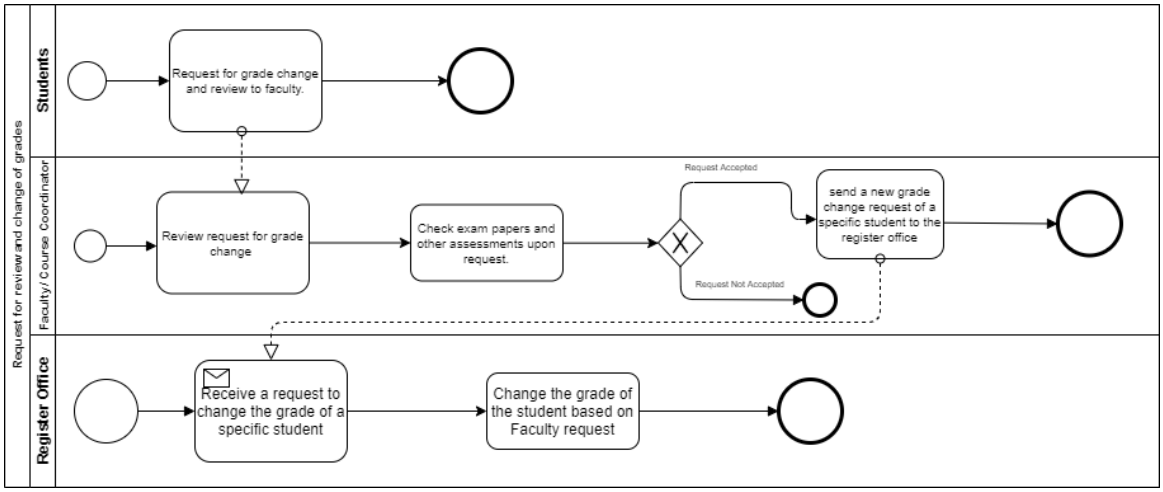


Figure 2.10: Process Diagram for Request for review and change of grades

PROBLEM ANALYSIS

Process Name	Stakeholders	Concerns (Problems)	Analysis (reason of the problem)	Proposed solution
Map course outcomes (COs) to program Learning Outcomes (PLOs)	1.Faculties	1.VC has to collect and send CO and PLO data to the Dean. 2.Dean sends data to department head and then it is passed to department. 3.Course instructor implements CO and PLO in their course.	The process is very complicated and time consuming as faculties must wait for other non-essential stakeholders to implement PLO and CO in their courses.	We can eliminate the involvement of department by giving faculties direct access to update PLOs and COs in our software and department head to update the PLO after further inspection
Check number of student enrollment in a department	1.Department 2.Dean	1.Register office collects all the new student's information. 2.Register office sends updated data to each department. 3.Department updates data to database. Then sends new data to Dean. 4. Dean makes calculation to see student enrollment comparison.	Same information is being send to different stakeholders individually. Which creates unnecessary repetition. Which makes the overall process time consuming.	We can make this information centralized, so that all the stakeholders can see latest information any time. We can also generate custom comparison Graphs/charts for any individual stakeholder.
Record Student Assessment Data to SPM	1.Faculty	1. Faculty had to calculate the total assessments marks and convert finals and midterms Marks of each student. 2. Bring all the marks of every student for a course into a Marksheet. 3. Grade the student	Making all the calculation manually is too much time consuming and chances human error is greater.	All the calculation can be done in SPM and graded accordingly. Adjustment in marks distribution can easily be made if change is needed
Produce OBE	1.Faculty	1. All	Making all the	Calculation can

Marksheet & Course Assessment Report		calculation have to done manually 2. Need to send data to register office to update database	calculation manually and waiting for register office to update data is too much time consuming and chances human error is greater.	be done by the help of the software and OEB marksheet can directly uploaded to database using the software
View records, OBE marksheets and Course assessment report	1.IEB/UGC 2.Dean 3.VC 4.Faculty	1. Faculty can't access the OEB marksheet directly 2. Calculations have to done manually and charts have to make manually to make comparison	Too many manual processes which takes time and resource. Therefore, lowers overall efficiency	We will generate automated charts, graphs and report for relevant stakeholder. we can collect most of the relevant data directly from IRAS, which will eliminate any extra steps. Faculty can view OEB marksheet of past semesters.
Request for review and change grade	1.Faculty	1. Faculty need to send request to register office to change the grade	Grade change could be done by faculty. Sending request to register office for grade upgrade adds extra work.	By giving access to change grade in our system we could eliminate the involvement of register office in our system.

RICH PICTURE (TO-BE)

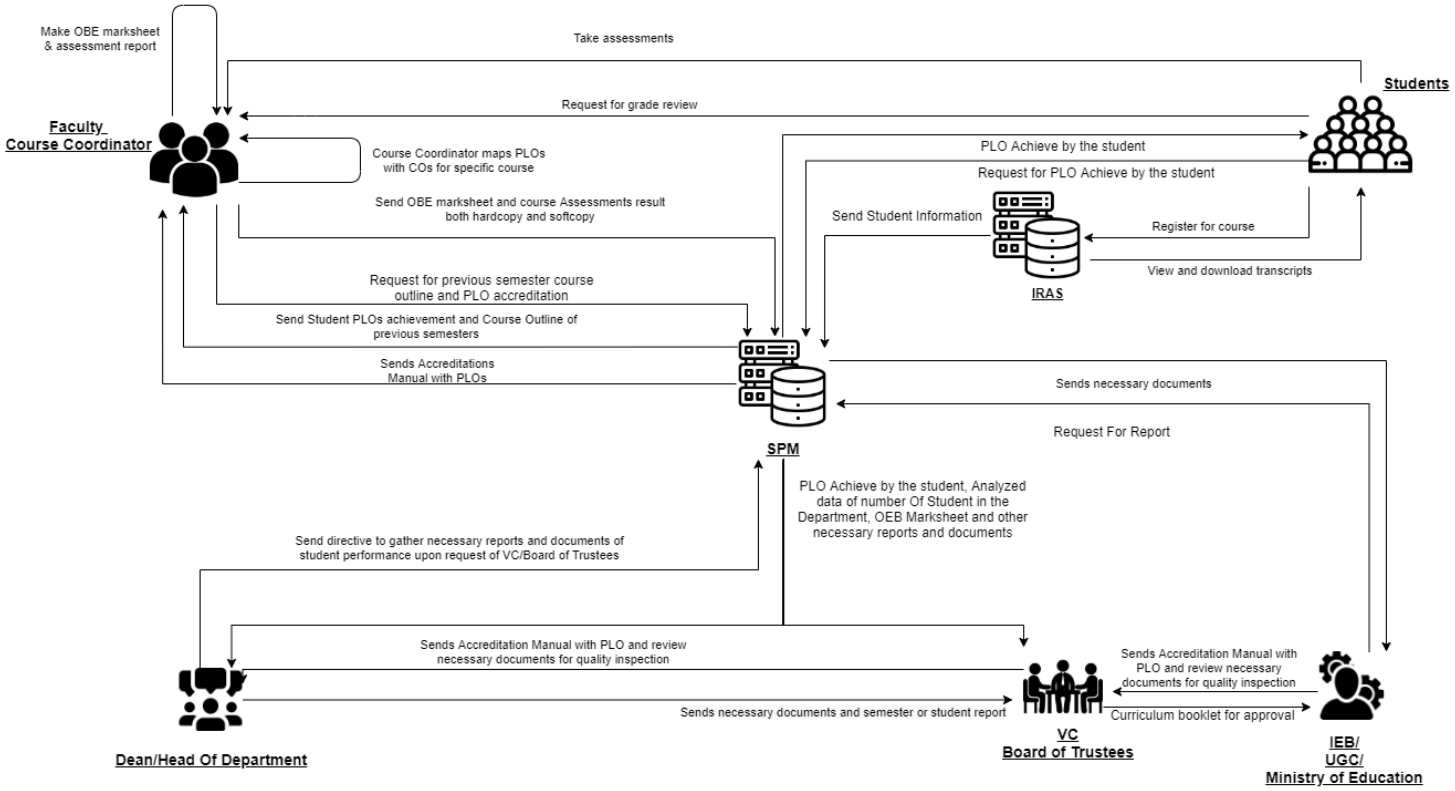


Figure 2.11: Rich Picture (To-Be)

SIX ELEMENTS (TO-BE)

Process	System Roles					
	Human	**Non-Comp Hardware**	**Computing Hardware**	**Software**	**Database**	**Network & Communication**
Map Course Outcomes (COs) to Program Learning Outcomes (PLOs)	**IEB/UGC/ Ministry of Education:** 1. Send Accreditation Manual with PLOs defined to VC/ Board Of trusties. **VC/ Board Of trusties** 1. Receive Accreditation Manual from IEB. 2. Send the Accreditation manual to Department Staff. **Head of Department / Dean of School:** 1. Receive Accreditation Manual from IEB. 2. Send the Accreditation manual to SPM 3. Direct Department Staff to tell Course Instructors and Coordinators to design Course Outline and Course Assessment Reports. **Course Instructor:** 1.Check if previous course content is present from SPM,	**Pen and paper:** 1. Is used for noting down intermediate brainstorming ideas. **Board and marker:** 1. Is used for noting down intermediate brainstorming ideas.	**Computer:** 1. Course Coordinators use computers to make softcopies of Course Outcomes (COs) of the specific courses they are experts in. **Printer:** 1. To print out hardcopies of Course Outcomes (COs).	**MS Word:** 1. Course Coordinators use MS Word to make a detailed course outline and Course Assessment Reports with Course Outcomes (COs) mapping to Program Learning Outcomes (PLOs). **Excel Sheet:** 1. Excel Sheet is used by Course Coordinators to map specific questions in the Midterm, Final exams and Project work to specific Course Outcomes (COs).	**IRAS Database server:** 1. IRAS uses a database server to store and maintain student grades' information. **SPM database:** 1. Records of PLOs	1. Use the internet and emails to communicate with UGC/IEB or other stakeholders to discuss important topics related to mapping Course Outcomes to Program Learning Outcomes. **Others:** 1. Use phones or physical means with stakeholders to discuss important topics related to mapping Course Outcomes to Program Learning Outcomes.

	otherwise make new course content. 2. List COs. 3. Map Course Content to Course Outcomes (COs). 4. Map COs to PLOs. 5. Map COs to specific questions of Mid-term, Final Exams questions and Project Work. 6. Starting to design course assessment report using course outline, Course Content and COs.					
Check Number of student enrollment in a department from SPM	**Student:** 1. Student enroll in a specific Degree program. 2. Student information is sent to SPM from IRAS. **Department Head/Dean:** 1.Recieve the data from SPM 2. School-wise, department-wise and program-wise student enrollment comparison can be seen. **VC/Board of Trustees:** 1.Recieve the	**Pen and Paper** 1. Sheet of number of students in a department is made along with student's information.	**Computer/ Phone:** 1. Uses computers to make softcopies of report or sheet of student information in departments. **Printer:** 1. Print hardcopies of report and sheet	**Coded Excel sheet:** 1.Department head or dean uses automated excel sheets to calculate the number student's in the department. **MS Word:** 1. Used to make report softcopies.	**IRAS database** 1. Records of students' enrollment in the department. **SPM database:** 1. Records of students' enrollment for all the departments.	**Internet/Mail:** **1.** An Online platform (such as Google Sheets) may be used for processing the student information data spreadsheet. **2.** Internet to access to SPM

	data from SPM 2. School-wise, department-wise and program-wise student enrollment comparison can be seen.					
Register for course	**Student:** 1. Login to IRAS 2. Student enroll in a specific course if all the pre requisite courses are completed otherwise can't process end. 3. Request for bill 4. Receive for bill 5. Pay the bill **Instructor** 1. Receive data of enrolled student. 2. Add student data in OEB marksheet.	**Pen and Paper** 1. Sheet of number of students enrolled for the course.	**Computer/ Phone:** 1. Uses computers to make softcopies of report or sheet of student information enrolled for the course. **Printer:** 1. Print hardcopies of report and sheet	**Coded Excel sheet:** 1.Instructor uses automated excel sheets for the semester OEB marksheet. **MS Word:** 1. Used to make report softcopies.	**Department Storage:** 1. Records of students' enrollment in the course. **IRAS database:** 1. Records of students' enrollment in the course.	**Internet/Mail:** **1.** An Online platform (such as Google Sheets) may be used for processing the student information data spreadsheet.
Record Student Assessment Data to SPM	**Faculty/ Course Coordinator:** 1. Assign project work and assignments according to course outline. 2. Take quizzes and exams throughout the semester according to course	**Pen & Paper:** 1. Use pen & paper to record assessment data and marks obtained on physical paper in tabular format(hardcopies).	**Computer:** 1. Creating softcopies of records of all assessment data for specific courses are done on computers.	**Excel Sheet:** 1. Record necessary assessment data and final grades on Excel Sheets. **IRAS:** 1. Upload students' final	**SPM:** 1. Records of students' assessment data and final grades may be saved in the SPM for future referenc	**Internet:** 1. The Internet is used to communicate with IRAS to store final grades of students. 2.Internet to access SPM

	outline. 3. Record assessment data of students throughout the semester of each student for every assessment (quizzes, assignments, project, exams) on softcopies and hardcopies. 4. Record marks for each specific question in the midterms and final exams. 5. SPM calculate total marks of quizzes, assignments and midterm and final exams and assign final grades to each student of specific courses. 6. Convert finals and midterms marks. 7. Bring all the marks of every student for a course into a Marksheet. 8. Grade the student according to current mark distribution if no change is needed else adjustment has been made. 9. Submit students' final			grades to IRAS for viewing by students or the registrar's office. **SPM** 1. Upload student from IRAS to SPM	e. **IRAS Database server:** 1. IRAS uses a database server to store and maintain student grades' information.	

	grades and marksheet on SPM.					
Produce OBE Marksheet & Course Assessment Report to SPM	**Faculty:** 1. Upload Marks in SPM to calculate total marks received for each CO by calculating the marks received for questions and/or other assessments mapped to COs. 2. SPM calculate total percentages received for each COs on the OBE Marksheet. 3. Declare if a student has achieved a specific CO (if CO percentage is greater than or equal to 40). 4. Declare if a student has received a PLO for a related CO. 5. SPM make a table giving the verdict and analysis of how many students were able to receive a certain CO and PLO and other documents containing necessary information and data. 6. Design Course Assessment Report	**Pen and Paper** 1. OBE marksheet stored in hardcopy. Additional markings may be made to further separate between students.	**Computer/ Phone:** 1. Uses computers to make softcopies of the OBE Marksheet and Course Assessment Reports from SPM. **Printer:** 1. Print hardcopies of final versions of the OBE Marksheets and Course Assessment Reports from SPM	**Coded Excel sheet:** 1.Faculty /Course Coordinator uses automated excel sheets to calculate the student's success/ failure in achieving PLOs from SPM **MS Word:** 1. Used to make Course Assessment Report softcopies. **SPM** 1. Store CLO and PLO information to SPM	**SPM Storage:** 1. Records of students' assessment data and final grades will be saved in the department for future reference in the SPM	**Internet/Mail:** **1.** An Online platform (such as Google Sheets) may be used for processing the OBE assessment data spreadsheet. 2. Internet to Access SPM

	using Course Outline, Course Content and Course Outcomes. 7. Submit the final version of the OBE Marksheet to the SPM					
View grades and download Transcripts	**Students**: 1. Log into SPM. 2. Search semester wise result for intended semester. 3. See grades for specific semesters. 4. Download transcript through browser into hard disk. **Dean/DOH:** 1. Log into SPM. 2. Search semester wise result for intended semester for a specific student. 3. See grades for specific semesters. 4. Download transcript through browser into hard disk. **Faculty/Higher Officials:** 1. Log into SPM. 2. Search semester wise result for intended semester for a specific student. 3. See grades	**Pen and Paper** 1. Tabulated transcripts may be printed onto paper. Hardcopy is used as the primary source of truth during applications and other paperwork.	**Computer/ Phone:** 1. Used for accessing IRAS. **Printer:** 1. Used to print the tabulated transcript. Prints tabulated transcripts.	**IRAS:** 1. **Store's** letter grades of each completed course 2. Provides the online user **interface** for viewing grades and transcripts. **SPM** 1. Store transcript data	**IRAS Database Server:** 1. A Database Management Service is used to store, maintain, edit and receive student grades information in IRAS. **Web Server:** 1. User interface and website pages are served using a remote web server. **SPM Storage:** 1. Records of students' assessment data and final grades	**Internet/ Email** 1. The **Internet** is used to communicate with IRAS to store final grades of students. 2. Softcopies may be **mailed**.

	for specific semesters. 4. Download transcript through browser into hard disk.				will be saved in the departm ent for future referenc e in the SPM	
View Records OBE Markshe ets, Course Assess ment Reports over a time period for inspectio n and analysis of student perform ance trend from SPM	**IEB/ UGC:** 1. Login to SPM 2. View records of OBE marksheet course Assessment report over time period for inspection and analysis of student performance trend 3. Download OBE marksheet course assessment report **Head of Dept/Dean of School:** 1. Login to SPM 2. View records of OBE marksheet course Assessment report over time period for inspection and analysis of student performance trend 3. Download OBE marksheet course assessment report performance trends .	**Pen and Paper:** 1. May be used for noting/mar king down key points of the report. 2. Hardcopie s of reports may be used.	**Computer:** 1. Used to display OBE Marksheet and Course Assessment Reports softcopies from SPM. 2. Send OBE and Course Assessment Reports to SPM. 3. View OBE Marksheet from SPM	**SPM** 1.Store informati on of OBE into SPM	**Depart ment Record s** 1. Retrieva l of OBE markshe ets and Course Assess ment reports when needed from SPM 2. Stores records on stakehol ders' interpret ation of student perform ance trends from SPM	**The internet:** 1. OBE marksheets and course assessment reports may be **mailed** online. 2. Online platforms such as Google Docs/Sheets display reports of softcopies. 3. Internet to access SPM

	VC/Board of Trustees: 1. Login to SPM 2. View records of OBE marksheet course Assessment report over time period for inspection and analysis of student performance trend 3. Download OBE marksheet course assessment report **Faculty/Higher Officials:** 1. Login to SPM 2. View records of OBE marksheet course Assessment report over time period for inspection and analysis of student performance trend 3. Download OBE marksheet course assessment report					
Request for review and change of grades	**Students:** 1. Request for grade change and review to faculty. **Faculty/ Course Coordinator:** 1. Check	**Pen and Paper:** 1. May be used to note down key points or marks on the students' answer sheets.	**Computer/ Phone:** 1. Used for communicating with the faculty.	**SPM**: 1. Used by the admin for changing the grade.	**SPM server:** 1. Update student grade data.	**Internet:** 1. Email is primarily used for communication. **Phone:** 1. May be used for communication.

	exam papers and other assessments upon request. 2. If change needs to be made, grade is changed in SPM and re-submitted. If not, end the process.					

PROCESS DIAGRAM (TO-BE)

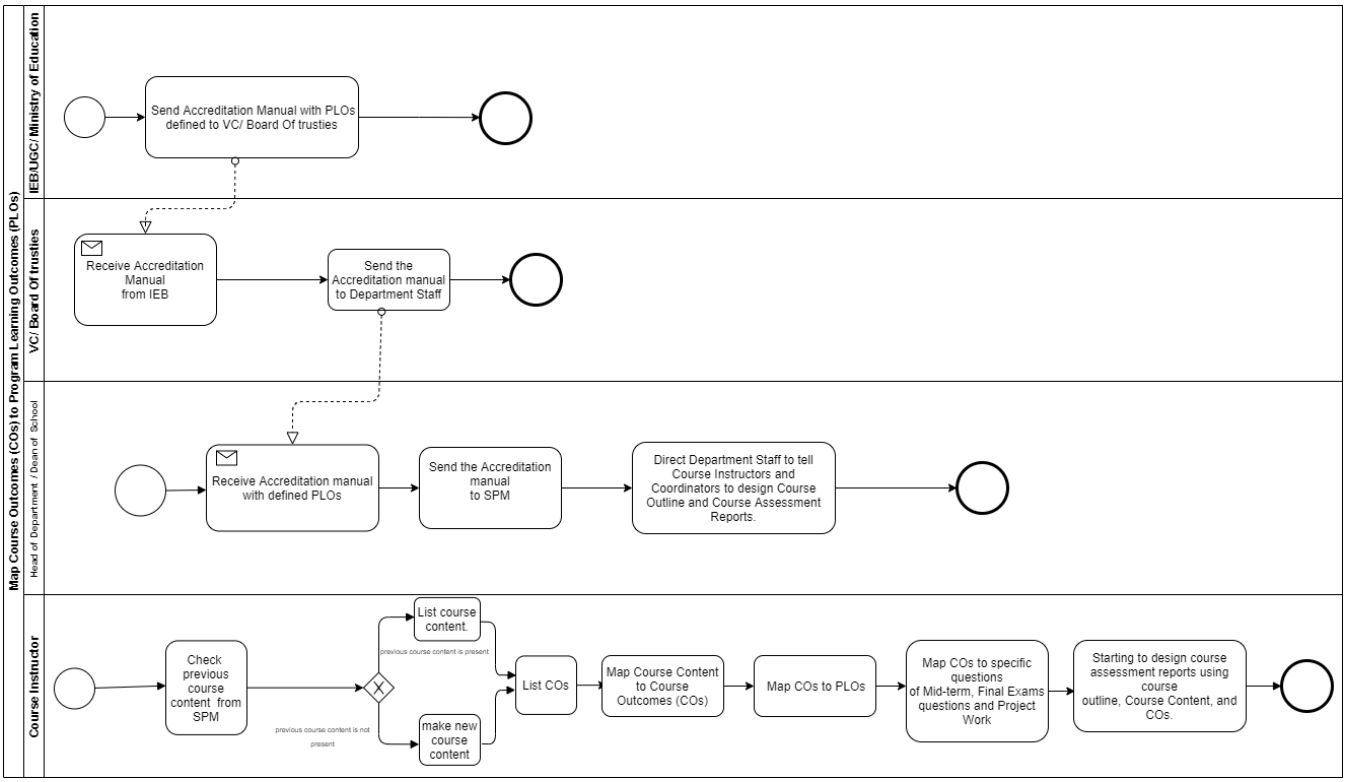


Figure 2.12: Process diagram for Map Course Outcomes (COs) to Program Learning Outcomes (PLOs)

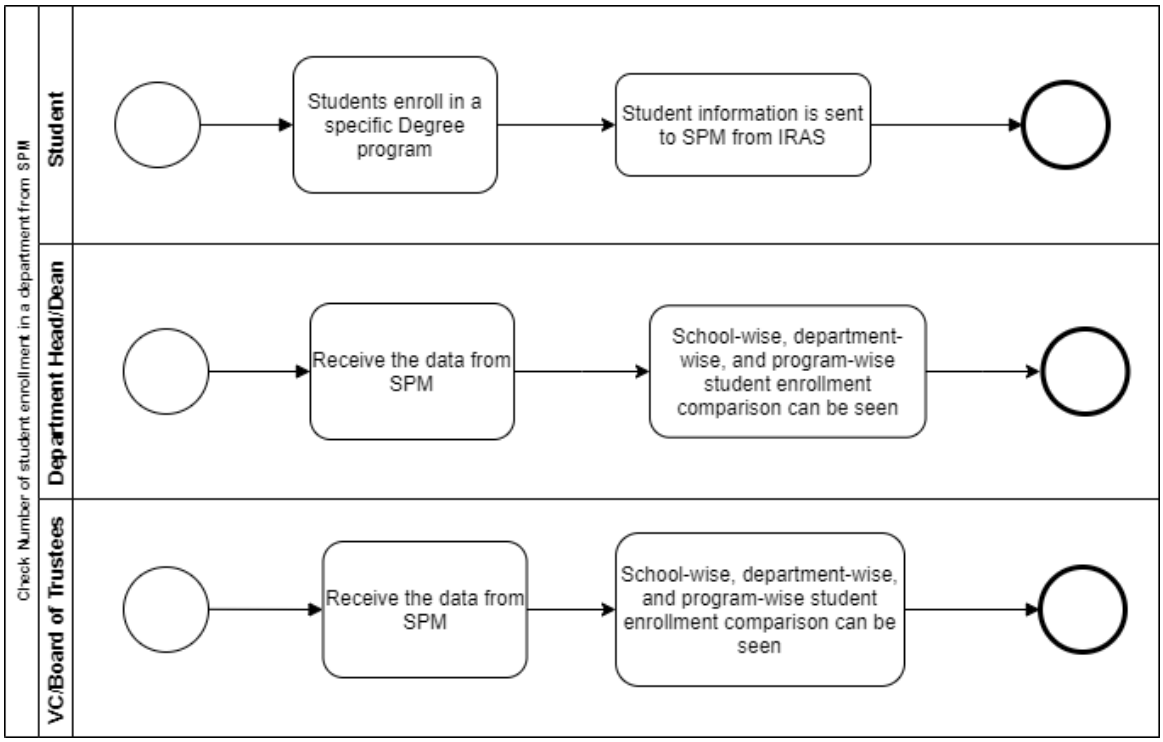


Figure 2.13: Process diagram for Check Number of student enrollment in a department from SPM

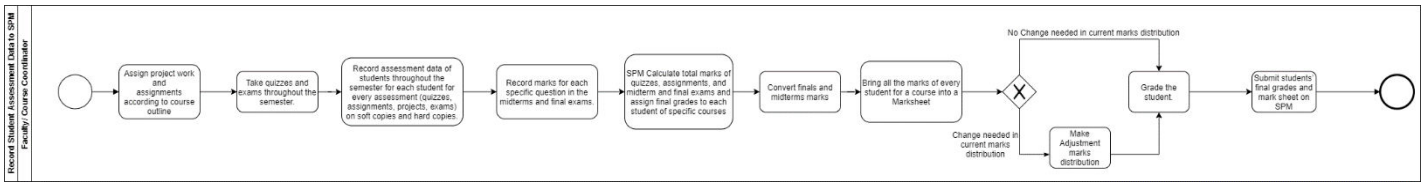


Figure 2.14: Process diagram for Record Student Assessment Data to SPM

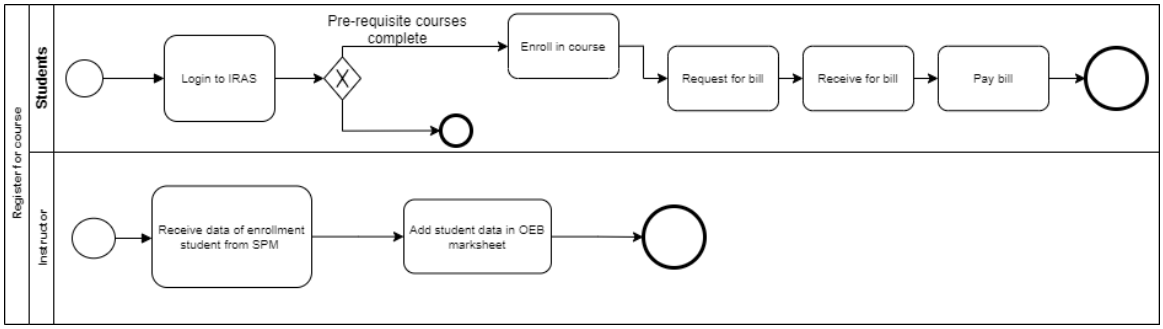


Figure 2.15: Process diagram for Register for course

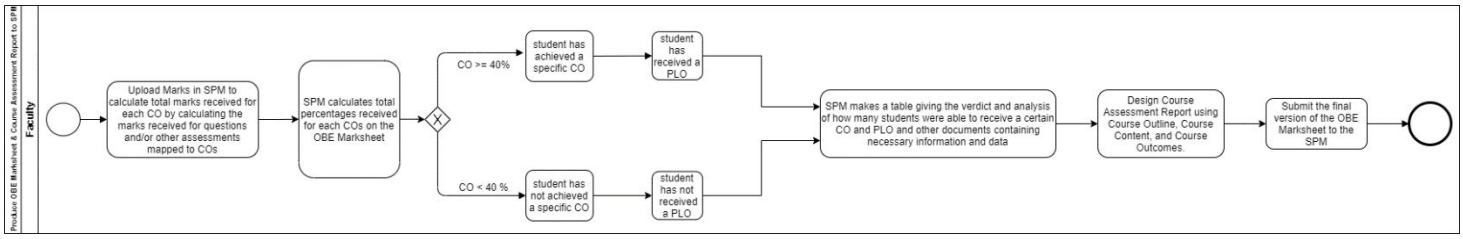


Figure 2.16: Process diagram for Produce OBE Marksheet & Course Assessment Report to SPM

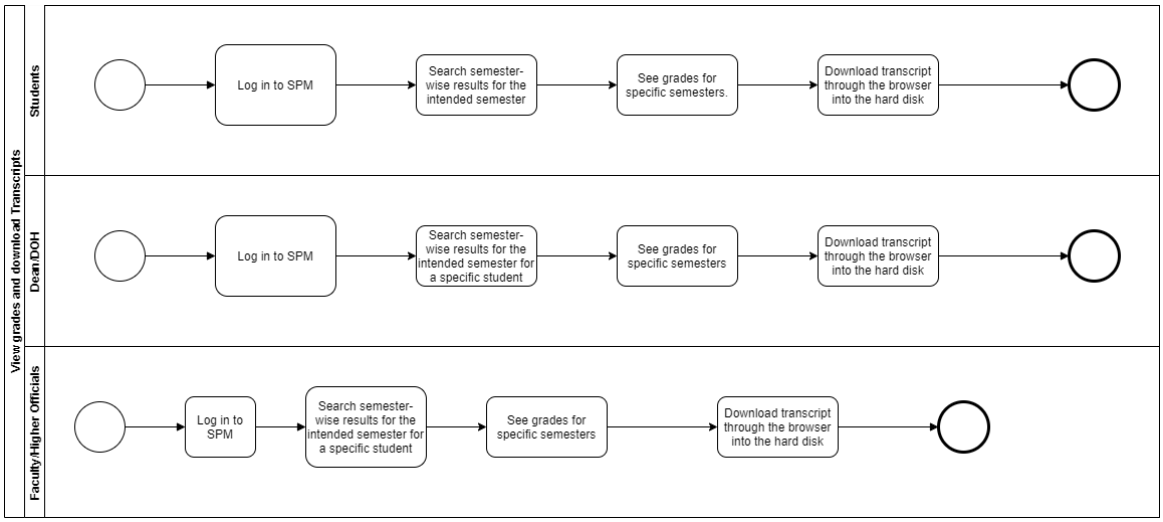


Figure 2.17: Process diagram for View grades and download Transcripts

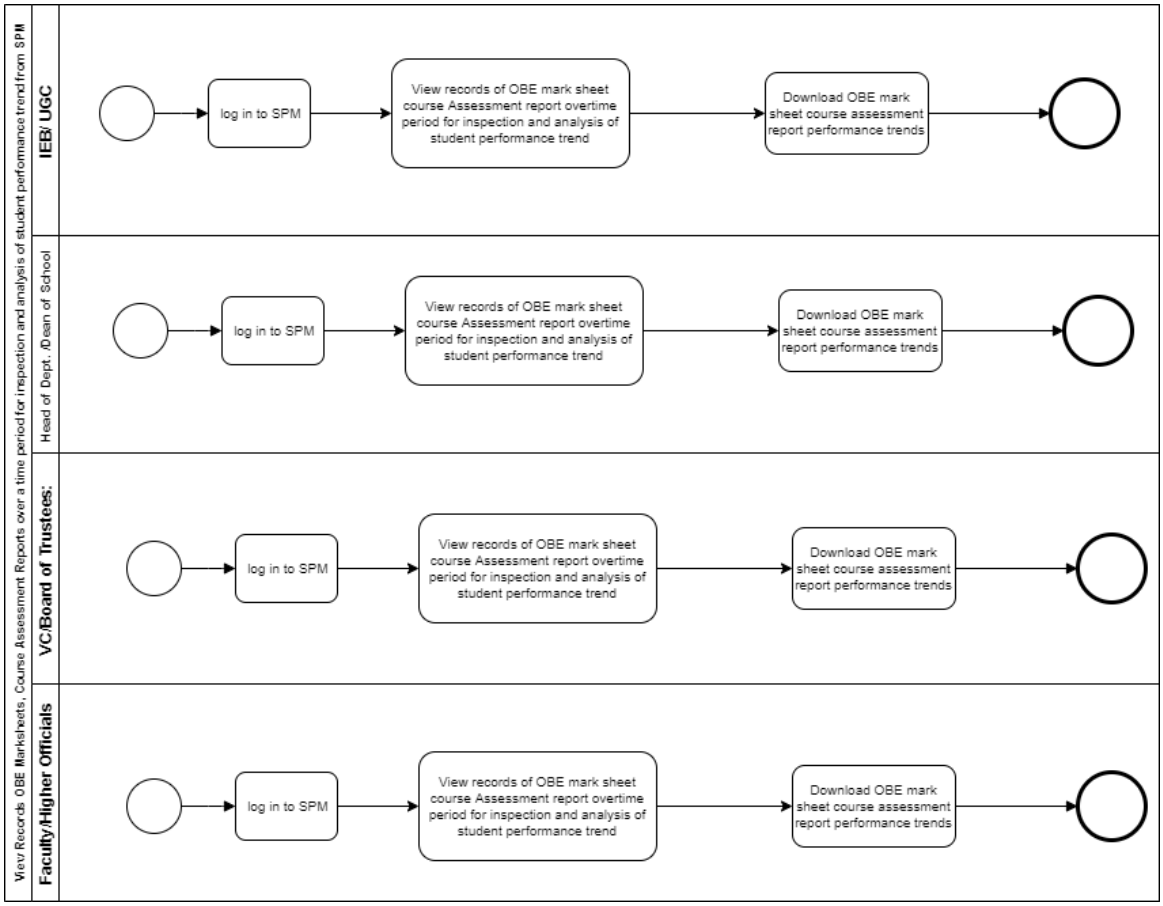


Figure 2.19: Process diagram for View Records OBE Marksheets, Course Assessment Reports over a time period for inspection and analysis of student performance trend from SPM

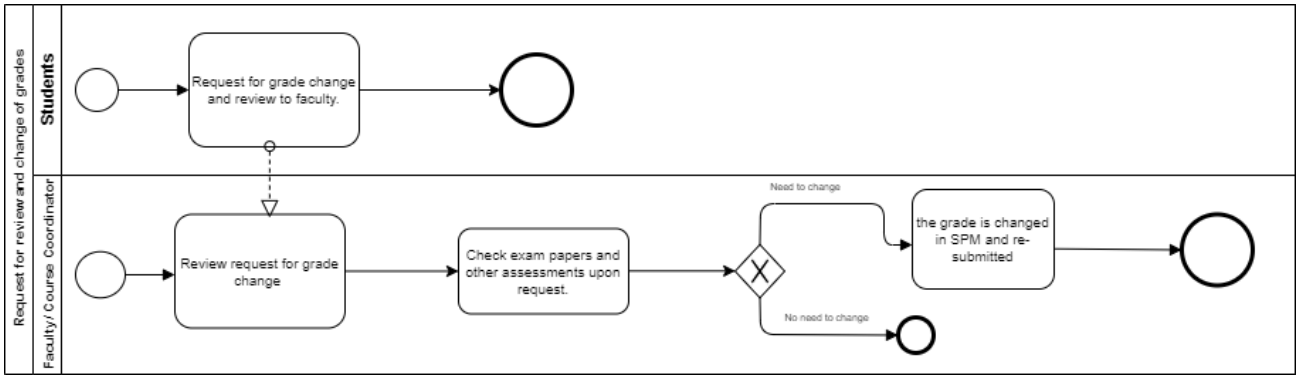


Figure 2.20: Process diagram for Request for review and change of grades

CHAPTER 3

LOGICAL SYSTEM DESIGN

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

BUSINESS RULE

All PLO (Program Learning Outcome) of each department and CO (Course Outcome) information of every course is recorded in the SPM system, which can be access by course instructor, department head, deans, VC, board of trustees and higher officials. In the case of a particular semester, the course instructor will be able to see how many students have been enrolled in each course. Department head, deans and VC can check how many students had enroll in a particular department and can also compare it with other departments. Faculty or Department Head or VC can view course / department-wise Student Performance Trends. The faculty can update the CO for each course, and the COs are be mapped to the PLOs, by the course coordinator, before the semester begins so that the faculty can determine whether or not each student has achieved the required PLOs.

in the system, IEB / UGC / Ministry of education has no permission to update PLOs, they can only view so it has to be sent to the VC/Board of trustees after which they update the PLOs for maps. Instructor, Head of department, Dean, VC and board of trustees can see the student performance trends and can compare with students that have taken same courses by the same instructor as well as other instructors. Students can view their earned PLOs for a specific course they've taken. Student performance trends for particular some courses or instructors can be seen. The system can see the PLOs required for this program 'IEB / UGC / Ministry of education or VC / Head of department 'might be able to monitor the performance of the students.

ENTITY RELATIONSHIP DIAGRAM

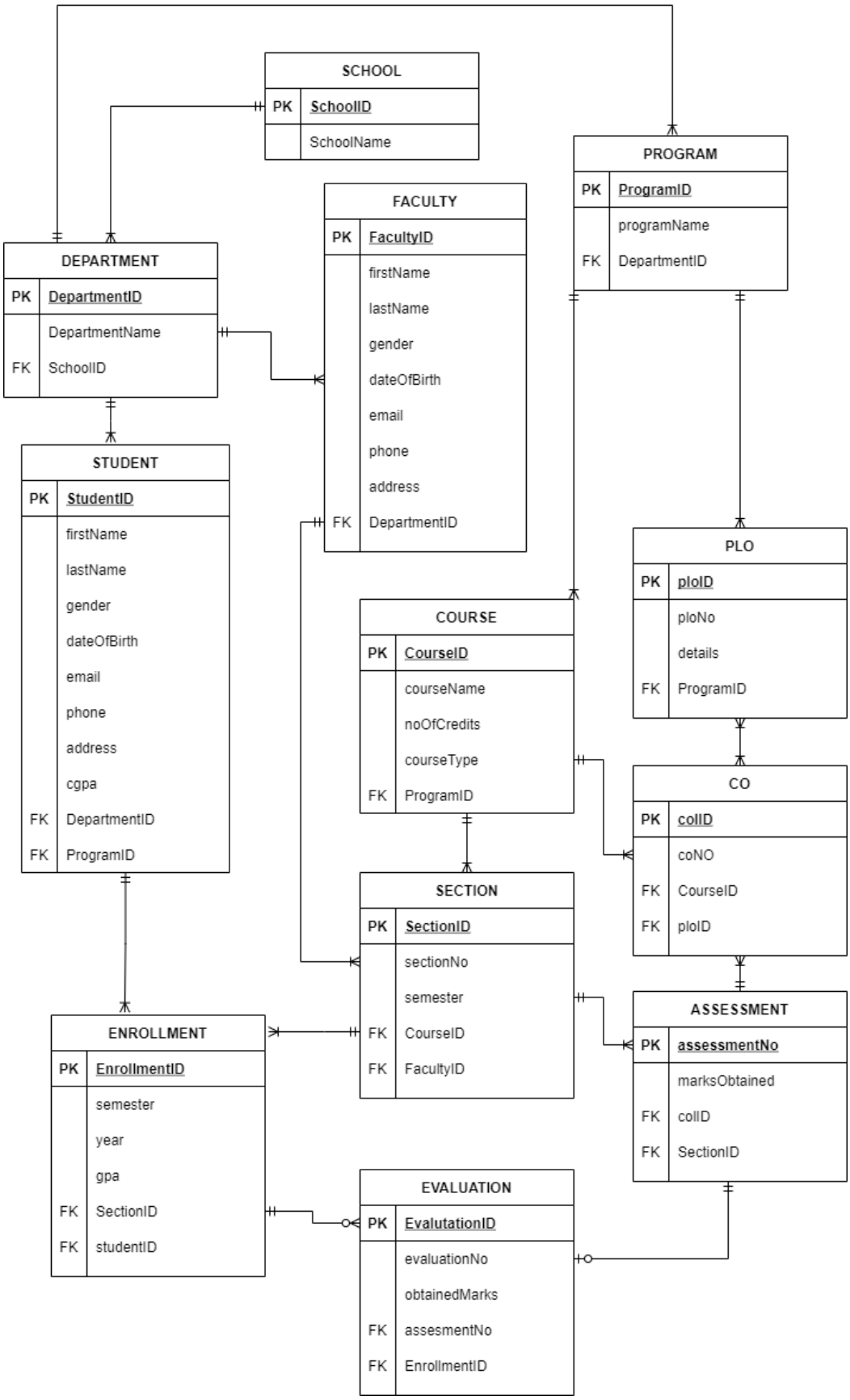


Figure 3.1: Entity Relationship Diagram of SPM

ENTITY RELATIONSHIP DIAGRAM TO RELATIONAL SCHEMA

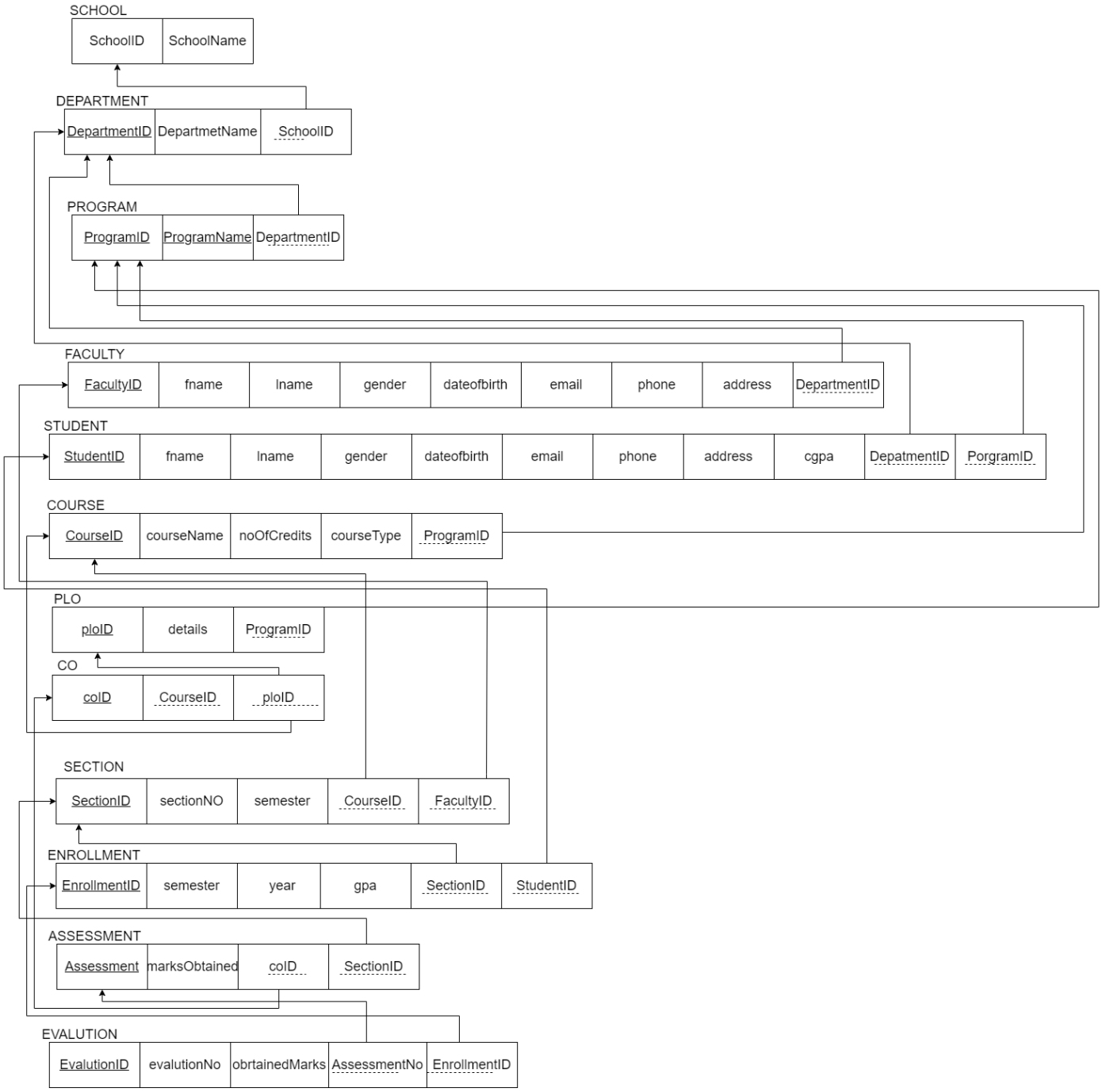


Figure 3.2: Relational Schema Diagram of SPM

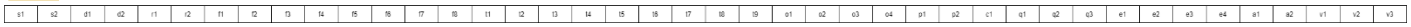
NORMALIZATION

School	SchoolID	s1	Faculty	FacultyID	f1
	SchoolName	s2		fname	f2
Department	DepartmentID	d1		lname	f3
	DepartmentName	d2		gender	f4
	SchoolID	s1		dateOfBirth	f5
Program	ProgramID	r1		email	f6
	ProgramName	r2		phone	f7
	DepartmentID	d1		address	f8
Student	StudentID	t1		DepartmentID	d1
	fname	t2	Course	CourseID	o1
	lname	t3		courseName	o2
	dateOfBirth	t4		noOfCredits	o3
	gender	t5		courseType	o4
	email	t6		ProgramID	r1
	phone	t7	PLO	ploID	p1
	address	t8		details	p2
	cgpa	t9		ProgramID	r1
	DepartmentID	d1	Section	SectionID	q1
	ProgramID	r1		sectionNo	q2
CO	coID	c1		semester	q3
	ploID	p1		CourseID	o1
	CourseID	o1		FacultyID	f1
Enrollment	EnrollmentID	e1	Evaluation	EvaluationID	v1
	semester	e2		evaluationNo	v2
	year	e3		obtainedMarks	v3
	gpa	e4		assessmentNo	a1
	StudentID	t1		EnrollmentID	e1
	SectionID	q1	Assessment	assessmentNo	a1
				marksObtained	a2
				coID	c1
				SectionID	q1

s1→	s2
d1→	d2, s1
r1→	r2, d1
f1→	f2, f3, f4, f5, f6, f7, f8, d1
t1→	t2, t3, t4, t5, t6, t7, t8, t9, r1, d1
o1→	o2, o3, o4, r1
p1→	p2, r1
c1→	p1, o1
q1→	q2, q3, o1, f1
e1→	e2, e3, e4, q1, t1
a1→	a2, c1, q1
v1→	v2, v3, a1, e1

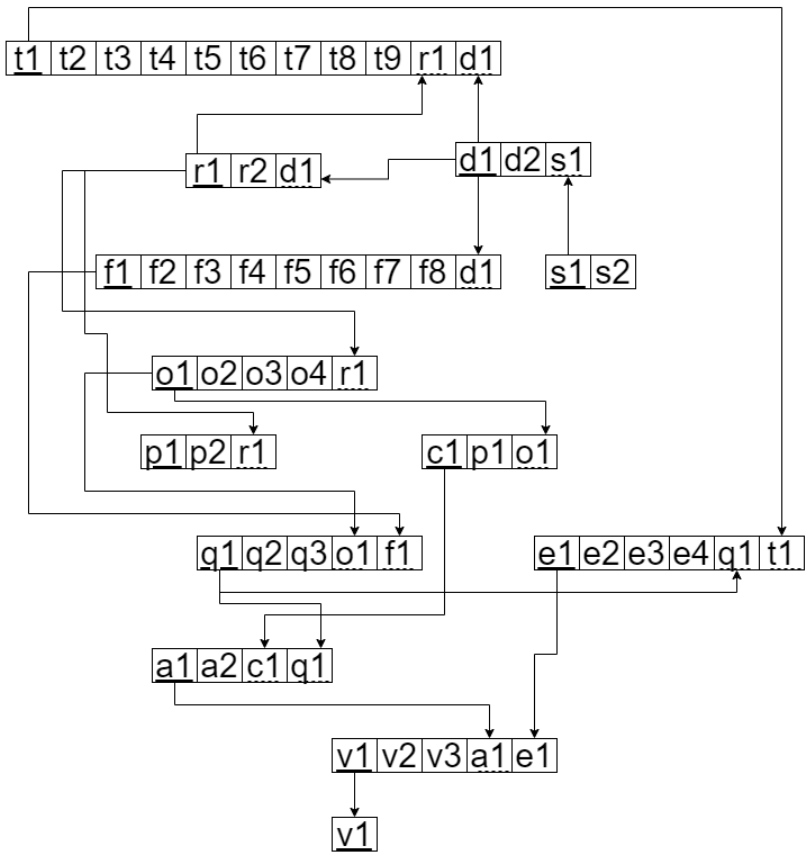
SchoolID➔	SchoolName
DepartmentID➔	DepartmentName, SchoolID
ProgramID➔	programName, DepartmentID
FacultyID➔	fname, lname, gender, dateOfBirth, email, phone, address, DepartmentID
StudentID➔	fname, lname, dateOfBirth, gender, email, phone, address, cgpa, DepartmentID, ProgramID
CourseID➔	courseName, noOfCredits, courseType, ProgramID
ploID➔	details, ProgramID
coID➔	ploID, CourseID
SectionID➔	sectionNo, semester, CourseID, FacultyID
EnrollmentID➔	semester, year, gpa, SectionID, StudentID
assessmentNo➔	marksObtained, ocID, SectionID
EvaluationID➔	evaluationNo, obtainedMarks, assesmentNo, EnrollmentID

1NF



2NF

3NF


t1 t2 t3 t4 t5 t6 t7 t8 t9 r1 d1
r1 r2 d1
d1 d2 s1
f1 f2 f3 f4 f5 f6 f7 f8 d1
s1 s2
o1 o2 o3 o4 r1
p1 p2 r1
c1 p1 o1
q1 q2 q3 o1 f1
e1 e2 e3 e4 q1 t1
a1 a2 c1 q1
v1 v2 v3 a1 e1
v1

DATA DICTIONARY

School_T

Name	Data Type	Size	Remark
cschoolID	VARCHAR22	5	This is the Primary Key of School Example: "SETS"
cschoolName	VARCHAR22	50	This is the name of the School. Example: "School of Engineering, Technology and Science"

Department_T

Name	Data Type	Size	Remark
cdepartmentID	VARCHAR22	5	This is the Primary Key of the Department. Example: "CSE"
cdepartmentName	VARCHAR22	50	This is the name of the Department. Example: "Computer Science and Engineering"
cschool_id	VARCHAR22	5	This is the Foreign Key of the table School. Example: "SETS"

Program_T

Name	Data Type	Size	Remark
cprogramID	VARCHAR22	5	This is the Primary Key for a Program Example:" B.Sc".
cprogramName	VARCHAR22	50	This is the name of the Degree Program. Example: "Bachelor of Science"
cdepartment_id	VARCHAR22	5	This is the Foreign Key from the Department table. Example: "CSE

Course_T

Name	Data Type	Size	Remark
ccourseID	VARCHAR22	**7**	This is the Primary Key for the Course. Example: "CSE203"
ccourseName	VARCHAR22	**50**	This is the name of the Course. Example:" Data Structure"
nnoOfCredits	INTEGER	**1**	This is the credit for the Course. Example: "3"
ccourseType	VARCHAR2	**20**	This is the type of the Course.

			Example: “Core”
cprogram_id	VARCHAR2	**5**	This is the Foreign Key from Program table Example:” B.Sc”.

Faculty_T

Name	Data Type	Size	Remark
cfacultyID	VARCHAR22	4	This is the Primary Key for Faculty. Example: “1803”
cfname	VARCHAR22	50	This is the first name of the Faculty. Example: “Sadita”
clname	VARCHAR22	20	This is the last name of the Faculty Example: “Ahmed”
ddateOfBirth	DATE	DD-MM-Y YYY	This the Date of Birth of the Faculty Example: “01-01-1993”
cgender	VARCHAR22	1	This is the gender of the Faculty. Example: “F”
cemail	VARCHAR22	50	This is the email address of the Faculty. Example: “sadita@iub.edu.bd”
cphone	CHAR	11	This is the phone number of the Faculty. Example: “01292383111”
caddress	VARCHAR22	50	This is the address

			of the Faculty. Example: “House 1, Road 1, Sector 1, Area, Dhaka, Bangladesh,
cdepartment_id	VARCHAR22	5	This is the Foreign Key from the Department table. Example: “CSE”

Student_T

Name	Data Type	Size	Remark
cstudentID	VARCHAR22	7	This is the Primary Key for the Student. Example: “1800001”
cfname	VARCHAR22	50	This is the first name of the Student. Example: “Shoban”
clname	VARCHAR22	50	This is the last name of the Student. Example: “Bhowmik”
ddateOfBirth	DATE	DD-MM-YYYY	This the Date of Birth of the Student. Example: “01-01-1998”
cgender	VARCHAR22	1	This is the gender of the Student. Example: “M”
cemail	VARCHAR2		This is the email address of the Student. Example: “1850105@iub.edu.bd”
cphone	CHAR	11	This is the phone

			number of the Student. Example: "0191211141"
caddress	VARCHAR2	50	This is the address of the Student. Example: "House 1, Road 1, Sector 1, Area, Dhaka, Bangladesh"
ncgpa	NUMBER	3,2	This is the cgpa of the Student. Example: 4.00
cdepartment_id	VARCHAR2	50	This is the Foreign Key from the Department table. Example: "CSE"
cprogram_id	VARCHAR2	50	This is the Foreign Key from Program table Example:" B.Sc".

Section_T

Name	Data Type	Size	Remark
nsection_id	INTEGER		This is the Primary Key for Section
nsectionNo	INTEGER		This is the section number. Example: "1"
ccourse_id	VARCHAR2	7	This is the foreign key from the Course table. Example: "CSE101"
cfaculty_id	VARCHAR2	4	This is the foreign key from Faculty table Example: "CO1"

Evaluation_T

Name	Data Type	Size	Remark
nevaluationID	INTEGER		This is the Primary Key for Evaluation
nobtainedMarks	NUMBER	5,2	This is the marks obtained by the Student Example: "29.5"
nassessment_id	INTEGER		This is the Foreign Key from Assessment table

Enrollment_T

Name	Data Type	Size	Remark
nenrollmentID	INTEGER		This is the Primary Key for Enrollment
csemester	VARCHAR2	6	This is the semester of Enrollment Example: "Summer"
dyear	YEAR	YYYY	This is the year of Enrollment. Example: "2018"

ngpa	NUMBER	3,2	This is the gpa of the semester. Example: 4.00
nsection_id	INTEGER		This is the Foreign Key from Section table
cstudent_id	VARCHAR2	7	This is the Foreign key from the Student Table. Example: "1800001"

Assessment_T

Name	Data Type	Size	Remark
nassessmentID	INTEGER		This is the Primary Key for Enrollment
cmarks	VARCHAR2	6	This is the semester of Enrollment Example: "Summer"
nsection_id	INTEGER		This is the Foreign Key from Section table
ncourse_id	INTEGER		This is the Foreign Key from the Course Outcome table Example:

PLO_T

Name	Data Type	Size	Remark
cplo_id	VARCHAR22	5	This is the primary key for Program Learning

			Outcome. Example: “PLO1”
cdetails	VARCHAR22	50	This is the details of the Program Learning Outcome. Example: “An ability to select and apply the knowledge, techniques, skills, and modern
cprogram_id	VARCHAR22	5	This is the foreign key from Program table Example: ”B.Sc”.

CO_T

Name	Data Type	Size	Remark
nco_id	INTEGER	2	This is the number of the Course Outcome. Example: ”1”
ccourse_id	VARCHAR22	7	This is the Foreign Key from the Course table. Example: “CSE101”
cplo_id	VARCHAR22	5	This is the foreign key from the Program Learning Outcome table. Example: “PLO1”