STUDENT PERFORMANCE MONITORING SYSTEM REPORT 1

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CHAPTER 1: INTRODUCTION

SECTION 1.1: BACKGROUND OF THE ORGANIZATION

Independent University, Bangladesh (IUB) established in 1993 is the leading private university in Bangladesh with an explicit focus on Research and Global partnerships. IUBs mission is to achieve the goals of higher education and of sustainable economic growth in the country through a two-way relationship between community and university. It's goals are to produce graduates of international standards within the local environment, with knowledge and relevant skills to provide leadership in enterprise, public service and welfare; encourage and support useful research; create knowledge; and provide further learning opportunities.

IUB currently have six academic schools:

- School of Business
- School of Engineering and Computer Science
- School of Environmental Sciences and Management
- School of Liberal Arts and Social Sciences
- School of Life Sciences
- School of Public Health

IUB is rapidly expanding its portfolio and is in the process of introducing Architecture and Biotechnology. The University curriculum and course of study are progressively revised and adjusted on the basis of their relevance to national needs and the global market demand. [1]

SECTION 1.2: BACKGROUND OF THE PROJECT

The Student Performance Monitoring System focuses on performance monitoring of student's continuous assessment (tests) and examination scores in order to predict their final achievement status upon graduation. The main idea is to evaluate the COs achieved and mapped PLOs achieved by each student in each of the enrolled courses as that would be necessary for monitoring the student performance.

SECTION 1.3: OBJECTIVES OF THE PROJECT

- One of the goals of this Project is to provide insight about how learning might improve in a given program-whether it be online, in a classroom, or happening in another context.
- To provide insight into what students are actually learning in relation to the big ideas of the courses and the program they aim to complete.
- To automate the process of monitoring student performance so as to reduce the manual processing involved in it.

- To analyze how student populations are learning inside of their programs so that the departments can focus more strategically on equity and success.

SECTION 1.4: SCOPE OF THE PROJECT

Scope of the project is a necessity to ensure the success of a project. As we are changing an existing system, we have to ensure that the proposed system will be more effective than the existing one. The proposed system would include evaluating the COs achieved, mapping the COs with the PLOs achieved and storing them as records, all of these were done manually in the existing system. The records can also be used to generate reports for analysis purpose. The system can be accessed by the instructors, students, parents, UGC, IEB and Higher Management (VC, Deans, Heads). It is very inefficient to maintain detailed records of student's performance, and therefore there is a need of an improved and automated student performance monitoring system. Primarily we focused on IUB as the organization for which we are doing this project but the project has the potential of being useful to UGC/IEB as well, and future prospects seems likely to also cater to all universities that conform to OBE regulations.

CHAPTER 2: REQUIREMENT ANALYSIS

SECTION 2.1: EXISTING BUSINESS SYSTEM DESCRIPTION (WITH RICH PICTURE)

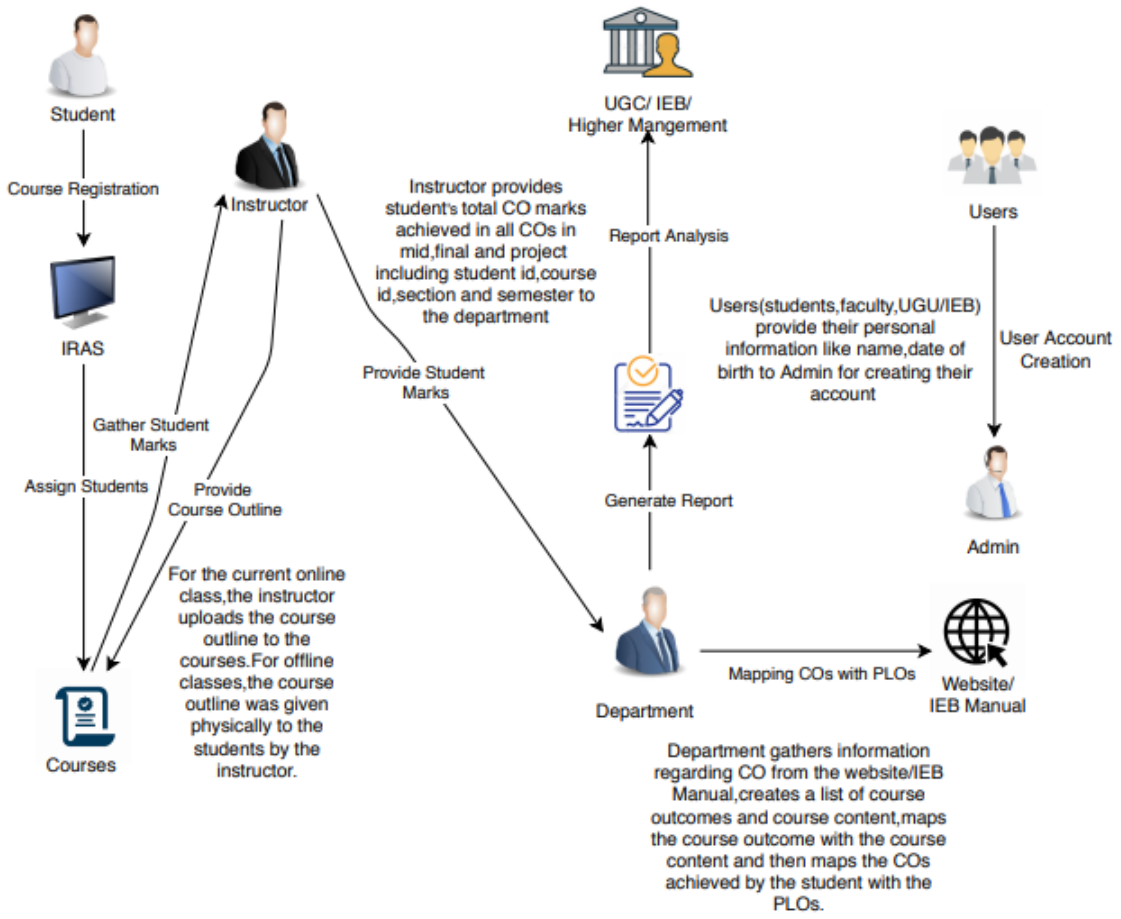


Figure 1: Existing System Rich Picture

In the existing business system, users create account for new users of the system by collecting user's name, DOB and assigns a certain id and password. IEB/UGC sends accreditation manual with PLO's defined to the department and then the department gathers CO from the corresponding PLO. Department creates a list of the course content if it is not available in the course outline and a list of course outcomes and maps the CO with the course content. The department then maps the received CO's to specific PLO's and hence mapping the CO's to specific questions of mid-term, final & project. For the current online system, the instructor provides the course outline to online classroom and for the physical classes, course outline is printed and distributed among the students. The instructor receives CO's to be achieved in a particular course and takes exams for assessing students in various course outcomes. Hence, the instructor converts the total marks and calculate total for all

the CO's. The instructor sends the CO's marks to the department. The department calculates CO percentages and if the percentage is greater than or equal to 40% a student passes that specific PLO and hence otherwise fails. The corresponding CO's are mapped against PLO's and PLO achievements are recorded. In order to generate a report, the department retrieves the student information of PLO achievement from previously calculated OBE mark sheet and makes report based on the requirements of UGC/ IEB/ Higher management.

SECTION 2.2: PROCESSES ALONG WITH SIX SYSTEM ELEMENTS

Process	System Roles					
	Human	**Non-Computing Hardware**	**Computing Hardware**	**Software**	**Database**	**Network & Communication**
User Account Creation	Admin: 1. Can create new users for the system. 2. Collect user information such as name, DOB based on their specific role. 3. Assigns a certain id and password for each individual user type. Users: 1. Provide personal information such as name, DOB to the admin for their specific role.	Pen & Papers: 1. The information sometimes are recorded manually.	Computer: 1. All related data is searched and stored using computer.	MS Excel: 1. All related information are stored.	Other Sources: 1. All related information are stored in the specific location.	None.
Mapping COs with PLOs	Department: 1. IEB/UGC sends accreditation manual with	None.	Computer: 1. All related data is searched and	None.	Other Sources: 1. All related information	All related data are searched through the internet.

	PLO's defined to the department 2. Department then gathers information regarding Course Outcome from the website/ IEB manual. 3. If the course content exist in the course outline, review the course content else create a list of the course content. 4. Creates a list of the course outcomes. 5. Mapping the CO with the course content. 6. Mapping the received CO's to specific PLOs. 7. Mapping CO's to specific questions of mid-term, final & project.		stored using computer.		are stored in the specific location.	
Provide Course Outline	Instructor: 1. For the current online class, Course Outline is uploaded to the online classroom (Google Classroom).	None.	Computer: 1. All related data is searched and stored using computer.	None.	Other Sources: 1. All related information are stored in the specific location.	None.

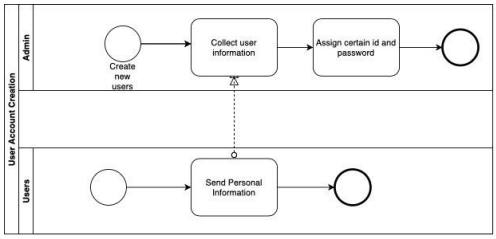
	2. For offline classes, Course Outline is printed and distributed among the students. 3. At the end of the semester, Course Outline is submitted to the department.					
Course Registration	Student: 1. On the reserved day for registration log in to IRAS with their id and password. 2. Go to registration page, load courses and select courses. Can only select courses of which prerequisites have been completed and the course capacity is not exceeded. 3. Click on 'DONE' button to complete the registration process. 4. A message prompts saying ''Registration Successfully Done".	Pen & Paper: 1. Sometimes course registration is done manually.	Computer: 1. All related data is searched and stored using computer.	IRAS: 1. IRAS has an interface for doing registration.	MS SQL Server: 1. IRAS is integrated with MS SQL Server. Other Sources: 1. All related information are stored in the specific location.	Internet: IRAS is a web-based application and requires internet to access.
Gather Student Marks from	Instructor: 1. Receives CO's to be	Pen & Paper: 1. Written exams	Computer: 1. All related data such as	MS Excel: 1. All related	Other Sources: 1. All	None.

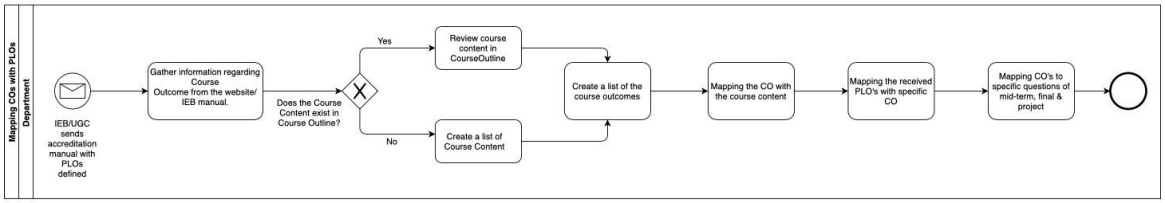
Courses they have enrolled	achieved in that particular course. 2. Takes exams such as mid-term, final & project to assess students in various course outcomes. 3. Gather marks for different assessment including student id, course id, section, semester. 4. Convert the total marks for mid-term, final. 5. Calculate total for all the CO's.	conducted by the faculty to evaluate the students.	student name, id is searched and stored using computer.	information are stored.	related information are stored in the specific location.	
Provide Student Marks	Instructor: 1. Provides students total CO marks achieved in all CO's in mid-term, final & project to the department including student id, course id, section, semester. Department: 1. Gather students marks in all CO's achieved based on mid-term, final & project with student id,	None.	Computer: 1. All related data is searched and stored using computer.	MS Excel: 1. All related information are stored.	Other Sources: 1. All related information are stored in the specific location.	All related data are provided through the internet.

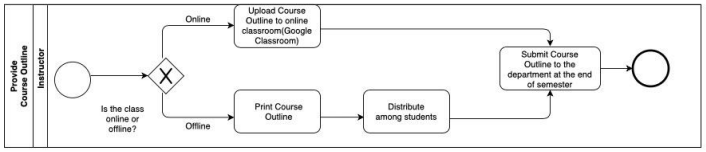
	course id, section, semester. 2. Calculates CO percentages. 3. If greater than or equal to 40% CO's have been achieved, a student passes that certain CO otherwise fails. 4. The corresponding CO's are mapped against PLO's and PLO achievements are recorded.					
Generate Report	Department: 1. Retrieve the student information of PLO achievement from previously calculated OBE marksheet. 2. Make reports after comparing results of multiple students. 3. Percentage of successfully passed or failed to achieve are calculated based on the total number of students.	None.	Computer: 1. All related data is searched and stored using computer.	MS Excel: 1. All related information are stored and calculated.	Other Sources: 1. All related information are stored in the specific location.	None.
Report Analysis	UGC/ IEB/ Higher Management:	Paper: 1. Paper is required for	Printer: 1. Print the report based	None.	Other Sources: 1. All related	None.

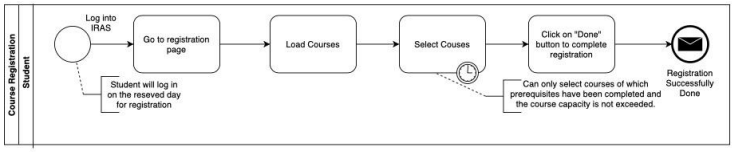
	Does analysis by 1a. Viewing number of students passing or failing in a certain PLO. 1b. Viewing progression of students with charts and graphs.	the printing purpose.	on users' request.		information are stored in the specific location.	

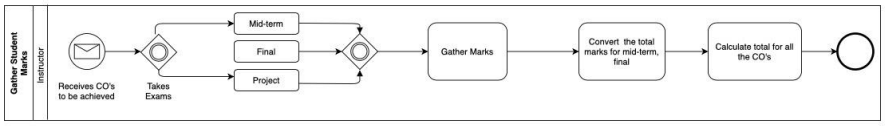
SECTION 2.3: PROCESS DIAGRAM (AS IS)

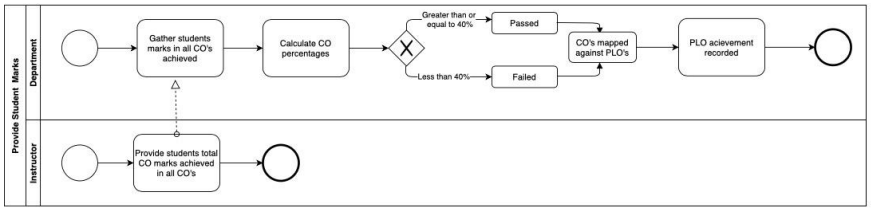


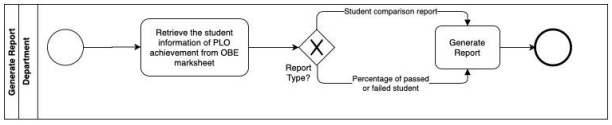












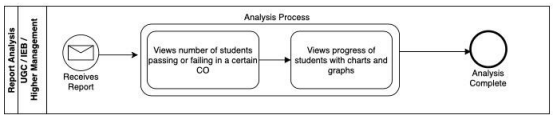


Figure 2: Existing System BPMN

SECTION 2.4: EXISTING PROBLEMS & ANALYSIS OF THE PROBLEM

Process Name	Stakeholders	Concerns (Issues / Problems)	Analysis (Reason of the Problems)	Proposed Solution
User Account Creation	Users	The users name might be similar.	There might be several persons with the same name.	In addition to the name and DOB the user provides for creating an account, they must also provide their contact numbers since contact numbers are unique and all these information must be stored in a system.
Mapping CO's with PLO's	Department	1. Manually creates a list of the course content if it does not exist in course outline. 2. Manually creates a list of the course outcomes. 3. Manually mapped the CO's with the course content. 4. Manually mapping CO's to PLO's.	All the processes for mapping CO's with PLO's are manually done by the department since there is no such system which can do the work without any manual task.	There can be a system which will gather the course content and course outcome from the department and then map the CO's with the course content and hence mapping the received CO's to specific PLO's.
Course Registration	Student	1. Course capacity gets filled up due to which students cannot register on the day they intended to. 2. Server gets jammed.	There is a specific capacity for any particular course and if the capacity exceeds then students cannot enroll in that course. During registration system cannot take huge load so it creates delay in the process.	Increasing the capacity of courses automatically as soon as it gets filled so that there is no delay in the registration process. There can be an information system where the load distribution is handled properly when there is extensive load. .
Gather Student Marks from courses they have enrolled	Instructor	1. Instructor gathers students marks from courses they have enrolled by taking assessments (mid,	The process of converting marks for each student in each of the courses is very inefficient	A system can be introduced which can take total marks for mid-term, final as an input and convert it and hence

		final, project) and converts the total marks for mid-term, final, project manually using MS Excel. 2. Using MS Excel calculate total for all the CO's.	and takes a lot of time. There is a chance of manual error as well during input or when calculating the marks.	automatically calculate total for all the CO's.
Provide Student Marks	Instructor	.Student marks that are provided to the department by the instructor are calculated manually. CO percentages are calculated manually using MS Excel. 2. Manually checking if a student passed or failed. 3. Manually recording PLO achievement from the CO received.	There is no such specific system which can automatically calculate CO percentages and determine whether the COs and PLOs have been achieved or not.	A system can be introduced which can calculate CO percentages automatically with the marks provided as an input .The system will show by what percentages the PLOs and COs have been achieved and also all the COs and PLOs that the student failed to achieve.
Generate Report	Department	Manually retrieving information from MS Excel.	The OBE marksheet submitted by the instructor to the department for generating report is stored in MS Excel so manually retrieving every information from it might be very ineffcient and can cause manual errors.	This issue can be resolved by introducing a system in which the faculty provides the OBE marksheet and through that system the department can automatically generate a report.

SECTION 2.5: PROPOSED BUSINESS SYSTEM DESCRIPTION (WITH RICH PICTURE)

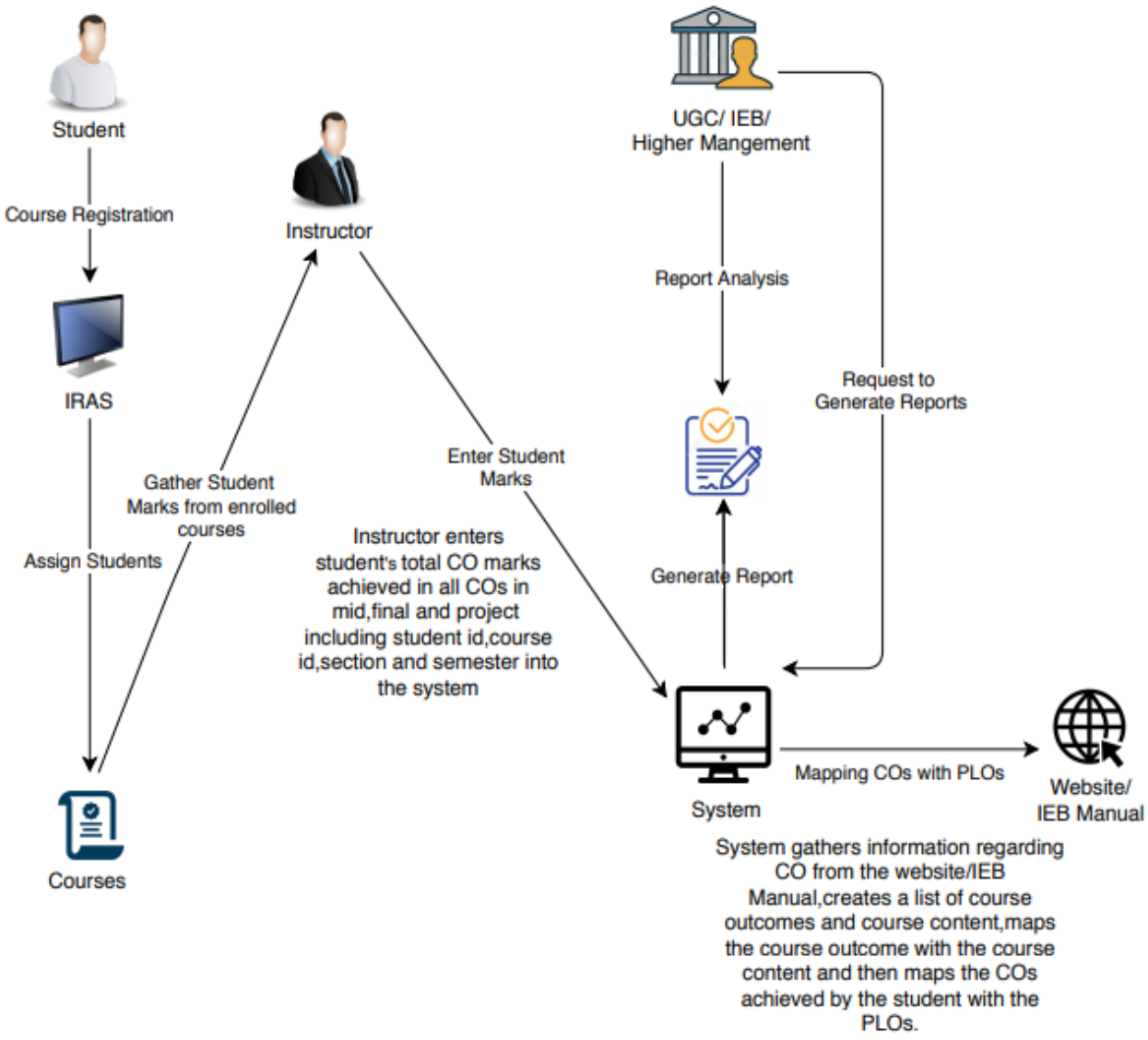


Figure 3: Proposed System Rich Picture

The system gathers the CO data from the website / IEB manual. Then the system creates a list of the course content and a list of the course outcomes and hence mapping the CO's with the course content. The CO's received are then mapped to specific PLO. The instructor receives CO's to be achieved in a particular course and takes exams for assessing the students in that course. The instructor than converts the total marks and calculates total for all CO's. The CO marks are provided to the system and the system stores the marks. Based on the stored information, the system then creates reports for analysis by the UGC/ IEB/ Higher management.

SECTION 2.6: PROPOSED PROCESSES ALONG WITH SIX SYSTEM ELEMENTS

Process	System Roles					
	Human	**Non-Computing Hardware**	**Computing Hardware**	**Software**	**Database**	**Network & Communication**
Mapping COs with PLOs	Department: 1. IEB/UGC sends accreditation manual with PLO's defined to the department 2. Department then gathers information regarding Course Outcome from the website/ IEB manual. 3. If the course content exist in the course outline, review the course content else create a list of the course content. 4. Creates a list of the course outcomes. 5. Login to the system with user ID and password. Map the CO with the	None.	Computer: 1. All related data is searched and stored using computer.	None.	Other Sources: 1. All related information are stored in the specific location.	All related data are searched through the internet.

	course content. 6. Map the received CO's to specific PLOs. 7. Map CO's to specific questions of mid-term, final & project.					
Course Registration	Student: 1. On the reserved day for registration log in to IRAS with their id and password. 2. Go to registration page, load courses and select courses. Can only select courses of which prerequisites have been completed and the course capacity is not exceeded. 3. Click on 'DONE' button to complete the registration process. 4. A message prompts saying ''Registration	Pen & Paper: 1. Sometimes course registration is done manually.	Computer: 1. All related data is searched and stored using computer.	IRAS: 1. IRAS has an interface for doing registration.	MS SQL Server: 1. IRAS is integrated with MS SQL Server. Other Sources: 1. All related information are stored in the specific location.	Internet: IRAS is a web-based application and requires internet to access.

	Successfully Done".					
Gather Student Marks from Courses they have enrolled	Instructor: 1. Receives CO's to be achieved in that particular course. 2. Takes exams such as mid-term, final & project to assess students in various course outcomes. 3. Gather marks for different assessment including student id, course id, section, semester. 4. Convert the total marks for mid-term, final. 5. Calculate total for all the CO's.	Pen & Paper: 1. Written exams conducted by the faculty to evaluate the students.	Computer: 1. All related data such as student name, id is searched and stored using computer.	MS Excel: 1. All related information are stored.	Other Sources: 1. All related information are stored in the specific location.	None.
Enter Student Marks	Instructor: 1. Login to the system with ID and password. Enter students total CO marks achieved in all CO's in mid-term, final & project into the system	None.	Computer: 1. All related data is searched and stored using computer.	MS Excel: 1. All related information are stored.	Other Sources: 1. All related information are stored in the specific location.	All related data are provided through the internet.

	including student id, course id, section, semester. 2. System stores students marks achieved in all CO's based on mid-term, final & project with student id, course id, section, semester. 3. Calculates CO percentages. 4. If greater than or equal to 40% CO's have been achieved, a student passes that certain CO otherwise fails. 5. The corresponding CO's are mapped against PLO's and PLO achievements are recorded.					
Generate Report	Department: 1. User will login to the system and retrieve the student information of PLO achievement	None.	Computer: 1. All related data is searched and stored using computer.	MS Excel: 1. All related information are stored and calculated.	Other Sources: 1. All related information are stored in the specific location.	None.

	from previously calculated OBE marksheet. 2. Generate reports after comparing results of multiple students. 3. Percentage of successfully passed or failed to achieve are calculated based on the total number of students.					
Request to Generate Report	UGC/ IEB/ Higher Management: Login to the system with user ID and password. Asking to generate report for: 1a. Viewing number of students passing or failing in a certain PLO. 1b. Viewing progression of students with charts and graphs.	Paper: 1. Paper is required for the printing purpose.	Printer: 1. Print the report based on users' request.	None.	Other Sources: 1. All related information are stored in the specific location.	None.

SECTION 2.7: PROCESS DIAGRAM (TO BE)

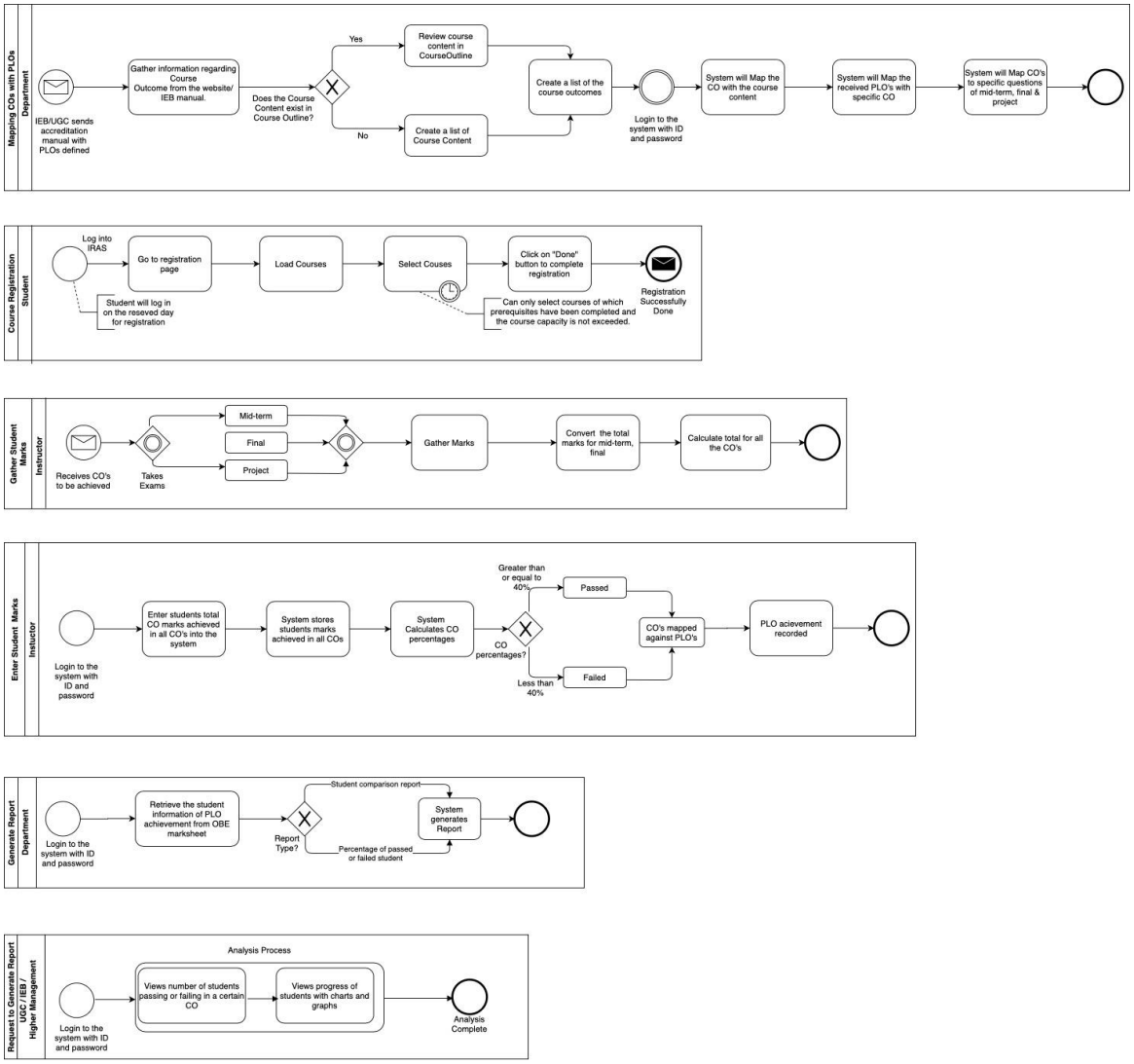


Figure 4: Proposed System BPMN

REFERENCES

[1] "IUB at a glance," [Online].