STUDENT PERFORMANCE MONITORING SYSTEM

Project Report

Section: 1

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CHAPTER 1: INTRODUCTION

SECTION 1.1: BACKGROUND OF THE ORGANIZATION

Independent University, Bangladesh (IUB) is one of the leading private university in Bangladesh. It was established in 1993. It focuses explicitly on Research and Global partnerships. Main mission of IUBs 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. Its goals are to produce graduates of international standards within the local environment, with knowledge and relevant skills so that it can provide leadership in enterprise, public service, and welfare, encourage and support useful research, create knowledge, and provide further learning opportunities.

Currently IUB 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 based on their relevance to national needs and the global market demand. [1]

SECTION 1.2: BACKGROUND OF THE PROJECT

The Student Performance Monitoring System helps assessing necessary information to help students, faculties, administrators, and policy makers. It can be used to evaluate, and analysis the CO's and mapped PLOs achieved by a student for his/her enrolled courses. It will also help to analyse the enrolment process and student progress for faculties, deans, heads, and VC.

SECTION 1.3: OBJECTIVES OF THE PROJECT

- To analyse the enrolment procedure and enrolment status of a student.
- To help the higher authorities such as VC, Dean or department head to understand and assess student progress.

- To provide insight into what students are 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 analyse 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

Using the basis of the existing system, we must update the system so that it is more user friendly and more helpful and more effective than it is now. The proposed system would provide us automatic insights on the enrolment trends, evaluate a student progress and store the record of a student's achieved CO and PLO's. The instructors, VC, dean, or department heads can also analyse and check a student's progress of any course or program's overall status. As most of the tasks mentioned above are done manually this day, it will be very helpful for the students, faculties, deans, or heads. We tried to implement this project for IUB, but it can be also used by UGC in the upcoming days with some updates and modification to get notified about all the universities.

CHAPTER 2: REQUIREMENT ANALYSIS

SECTION 2.1: RICH PICTURE (AS IS)

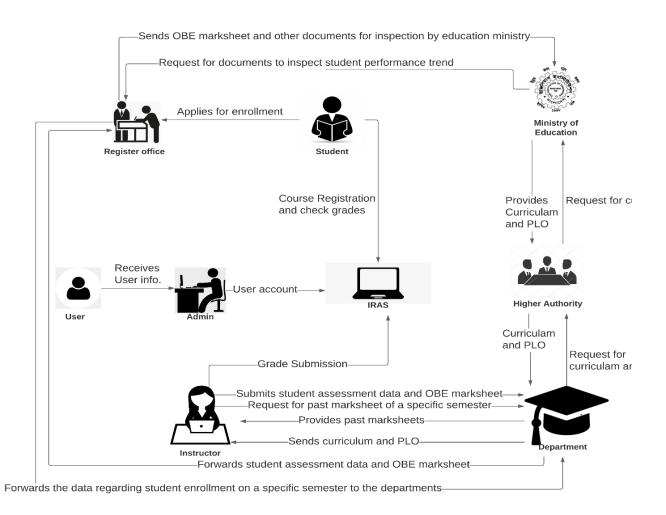


Figure 1: Rich Picture (AS-IS)

SECTION 2.2: PROCESSES ALONG WITH SIX SYSTEM ELEMENTS (ASIS):

Process Name	Human	Non- Computing Hardware	Computing Hardware	Software	Database	Network & Communications
1) User Account Creation	User: Provides information depending on their specific role such as- name, personal information, degree program etc to the admin by registration process and HR Admin: 1) Create user account on IRAS Collect	Pen & Paper User provides all the necessary documents for account creation.	collected and		stored in a	1) Internet is used to associate with IRAS to input account information 2) User's interface and website pages are served using internet access.
	information such as- student name, address,date of					

	birth, contact number, degree program enrollment etc 3) Collect faculty information from HR 4) Admin provides user ID and password for each individual user type. For example: - student, faculty.					
2) Student enrolment record	1) Enrolls in a certain Degree program. 2) Provides enrollment data to the register office Register Office: 1) Collects the enrolment data from the student	Pen and paper: Students may use provide the enrolment information manually	-	Data may be recorded is MS excel	office collects the data and	Ü

	2) Keeps a copy of the data and forwards the data regarding student enrollment in a certain degree program on a specific semester to the specific departments: 1) Receives the total number of student enrollment on a specific semester from the register office.				
3) Student Assessment Records	Student: Submit project work and assignments. Gives exams for each of the course taken in a specific semester Instructor:	Pen and Papers are used to record assessment marks	the excel sheet. Upload students' final	information are stored in the IRAS database Documents are stored in	Internet: The Internet is used to communicate with IRAS to store final grades of students

1) Take quizzes and exams and assign project work and assignments throughout the semester to the students. 2) Records assessment data of each student throughout the semester for every exams and assignments 3) Calculate total marks of quizzes, assignments and midterm and final exams and convert the marks to assign final grades to each student of specific courses according the marks to distribution provided. 4) Upload student's

	final grades on IRAS and also send them to the Department: 1) Receives assessment record from instructor and sends a copy to the register office				
4) Create OBE Marksheet & Course Assessment Report	Instructor: 1) Evaluate marks achieved by the students for each question and other assessment mapped to CO. Thus calculate the total marks received for each CO. 2) Calculates CO percentages. If greater than or equal to 40% CO's then it is considered to be achieved, a student passes that	 make softcopies of the OBE Marksheet and Course Assessment Reports. Printer is used	success/ failure in achieving PLOs. MS word is used to make assessment	students' assessment data and final grades will be saved in the department	

certain CO otherwise fails. Record the information in the OBE marksheet		
3) The corresponding CO's are mapped against PLO's and PLO achievements are recorded.		
4) Make Course Assessment Report using Course Outline, Course Content and CO		
5) Submits OBE marksheet and assessment report to the department		
Department:		
1) Receives the OBE Marksheet and Course Assessment Report from the instructor		
2) Stores the		

	3) Forwards the OBE marksheet, Course Assessment Report and others to the Registrar's Office. Registrar's Office: Stores the OBE Marksheet and Course Assessment Reports			
5) Analysis of Student Performance trends by instructor	Instructor: 1) Request the department to provide the OBE Marksheets, of a specific semester. To check the performance trend of a student from past semester 2) Analyses the documents one by one Department: Provides the	Paper To print hard copies of the marksheet	Microsoft Office: 1) Faculty uses automated excel. sheets to calculate. the student's success/ failure in achieving PLOs.	Internet: Submission and Request Can be send via email

	document request by the instructor					
6) Overall Performance trend inspection	1)Submits student assessment record and OBE marksheet to department: 2)Receives the OBE mark sheets and assessment report from the Instructor, records them 3) Sends a copy to the Register office. Register office: 1) Receives OBE marksheet, student assessment report form all the departments 2)Collect all documents together	For Printing Hard copies of the reports	_	Microsoft Office: Used to make reports using Microsoft word and excel	access data related to the	Internet: Needed to access the web to send a copy of the reports as emails to their respective users

	and submit them to the education ministry. Ministry of Education: 1)Requests register office to provide documents to check student performance trend 2)Receives the documents and analyses them one by one					
7) Mapping of PLO's & CO's	Ministry of education: 1) Provides PLO to Higher authority Higher Authority: 1) Request to provide PLO and curriculum 2) Receives the curriculum and	Pen & Paper: May be used to collect information and also make reports as per request by Higher Authority, departments or faculties	Needed to store the updated information Printer: May be used to print hard	Microsoft Office: Instructor updates mapped CO in the excel sheet. Maps question using Microsoft Word and Excel	Store and access data related to the PLOs and COs in the form of PDF, DOC, XLSX files etc.	Internet: Needed to access the web to send emails to their respective users

PLOs under the OBE model for each program from the education ministry.	copies of the reports	
3)Sends the new curriculum and PLOs to the Department		
Department: 1) Receives the curriculum and PLOs		
2) Provides Curriculum and PLO to the instructors to design CO and assessment data		
Faculty:		
1) Receives the course curriculum and PLO		
2)Maps COs to specific questions		

of mid term, final exam questions and project work from the given PLOs.			

SECTION 2.3: PROCESS DIAGRAM (AS IS)

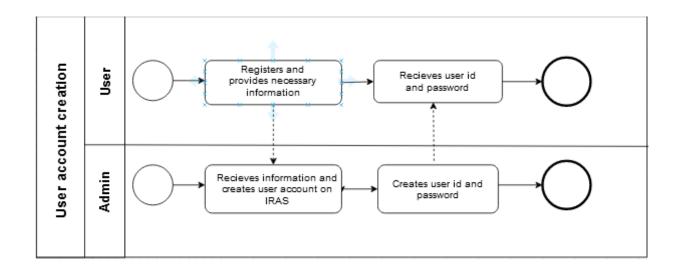


Figure 2: Process Diagram for User Account Creation

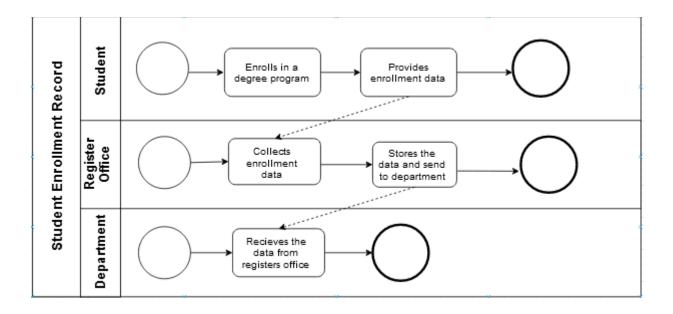


Figure 3: Process Diagram for Student Enrollment Records

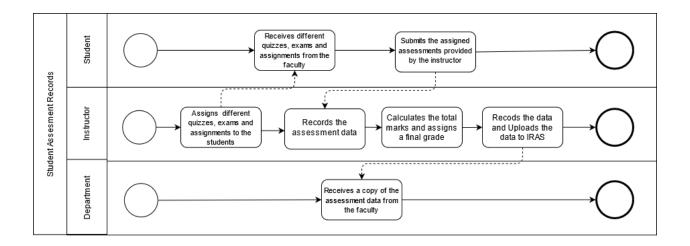


Figure 4: Process Diagram for Student Assessment Records

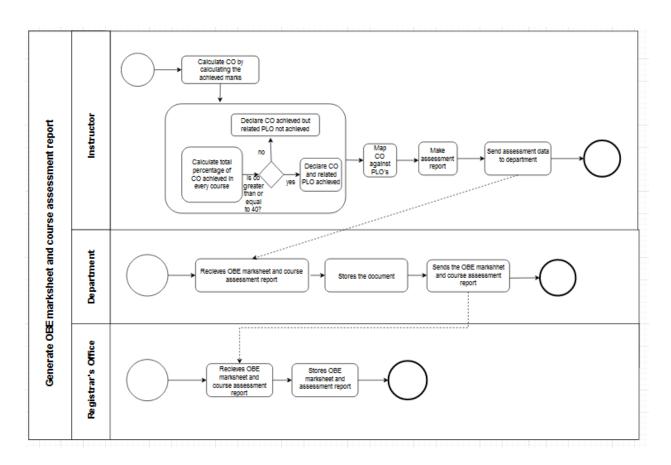


Figure 5: Process Diagram for Generating OBE Marksheet and course assessment records.

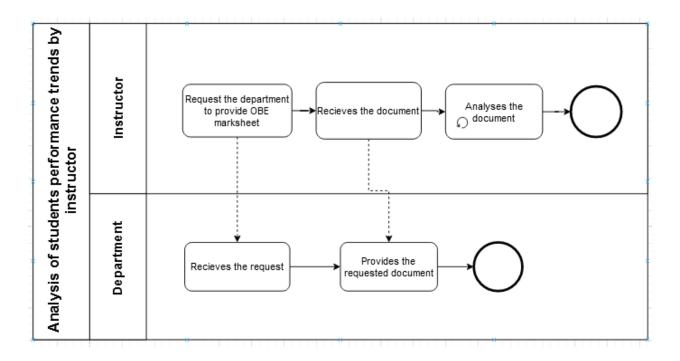


Figure 6: Process Diagram for Analysis of Students Performance trend by instructor

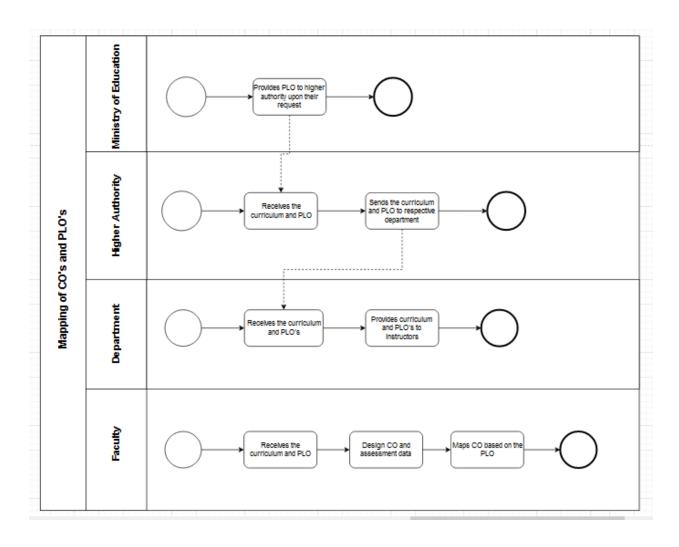


Figure 7: Process Diagram for Mapping of COs and PLOs

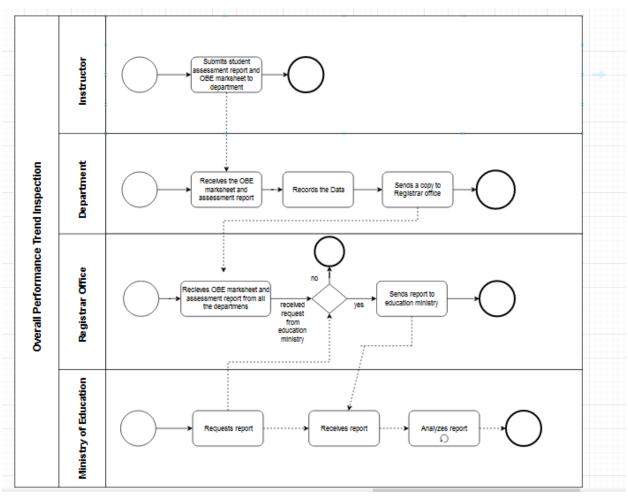


Figure 8: Process Diagram for Overall Performance trend inspection

SECTION 2.4: PROBLEM ANYLYSIS

Process Name	Stakeholders	Concerns	Analysis	Solution Proposed
1) Student enrollment record	Register office Department	 Register office collects the enrollment data from students on a specific semester and keeps a record Forwards copies of the record to different departments. Departments receive the student enrollment data on a specific semester from the register office. 	 Forwarding the enrollment records to different departments is an inefficient process. Departments have to receive the data regarding student enrollment from the register office not directly from IRAS. If a higher authority or department wants to compare the enrollment data with another department, they have to analyses the records on their own. 	1) In our SPMS, the register office will only input the data of the total number of student enrollment and the SPMS will automatically produce different graphical representation of the data which will show different comparison trends, e.g schoolwise, department-wise, etc. Departments and Higher Authority will have direct access to the report.

2)Record of Student Assessment	Instructor	For instructor evaluation of total marks achieved for each CO and calculation of total percentage of CO one by one can have a high chance of manual error. Submitting hardcopy and softcopy of OBE Marksheet and Course Assessment Report to the Registrar's Office or Department Office is a time consumption process and delays or loss of information and important data. After receiving the documents from Instructors, storing them can be an insufficient process and hard work to manage.	Collecting all the data regarding student assessment and keeping record and finding the trend will extremely hard and lengthy process, chances of manual errors are high and the process will be inefficient For departments storing the documents received from the instructor can be a difficult process to manage Keeping track of all the soft copies and hard copies will take lots of time and it is a disorganised process	Faculty can input the student assessment information directly into SPMS and it will generate a proper report which can be viewed by the higher authority and departments etc
3)Create OBE Marksheet & Course Assessment Report	Instructor Department Register Office	Instructor manually creates OBE marksheet and assessment report by using excel, In the existing system there is no proper representation of assessment report Submitting the OBE marksheet and assessment documents to the department is a time consuming process	Instructors calculates the marks and manually inputs the data in excel sheets which can cause manual error while formatting the columns and the risk of misplacings and losing the file is file	Instructors will input data regarding student assessment and SPMS will automatically generate OBE marksheet and generate an assessment report as the table of mapped CO and PLO are already in the SPMS which will show the percentage of students with achieved COs and not achieved CO's in a graphical representation.

			,there's high risk of losing or misplacing the data		access to the system to check the assessment report
Studen Students Stude	alysis of dent mance ds by ructor	Instructor	To check a students previous records faculty have to request the department to provide marksheet Of a specific semester Faculty have to search for the record one by one manually from several documents .	Collecting marksheet from department and analysing the student performance trend one by one manually is a difficult and time consuming process. Department might delay to provide the desired document to the Instructor	In our SPMS, Instructor can directly search the desired document and it will show the result no need to ask the department for any document

5) Overall Performance trend inspection	1.Instructor2. Department3.Higher Authority4. Ministry of education	Instructor will submit the data regarding student assessment, OBE marksheet to the respective departments Departments will forward the documents to the register office The Ministry of Education and higher Authority will have to request the register office to view for a regular inspection and analyze the documents one by one manually.	Collecting documents from different departments and Combining all the data containing multiple categories for submitting to the education ministry will be a hard working process and time consuming. The Ministry of education will have to receive documents from the register office not directly from IRAS. Analyzing the report one by one and making decision based on that is a difficult process	In our SPMS, the Instructor will only input the student assessment record; it will automatically produce different graphical representations of the data which will show different overall performance trends, e.g school-wise, department-wise, CGPA-wise etc. The Ministry of education will have direct access to the system.
6) Mapping of PLO's & CO's	Ministry of education Higher authority Department Instructor	Ministry of education provides PLO and curriculum to the higher authority as per request. Department receives the PLO and curriculum from higher authority and forwards it to the instructor Instructor mappes the new CO's according to the curriculum and PLO received from the department. Mapping CO and PLO to	Higher Authority have to request and wait for the ministry to provide curriculum and PLO there is a risk of losing the mail/hard copy sent by the ministry Higher Authority have to send the PLO and curriculum to every departments, misplacement and miscommunication can occur in this process Departments have to forward the PLO and curriculum to every instructor. Instructors have to wait for the department to send documents. Delay and	Ministry of education can directly provide PLO into SPMS Instructor can receive the PLO directly from the SPMS Instructor can upload mapped CO to specific questions of specific exams taken as a table on directly the SPMS system Which will can be used to produce Assessment report and marksheets

specific questions and upload in the excel sheet has a risk of manual error	problems occur in this process	

SECTION 2.5: RICH PICTURE (TO-BE):

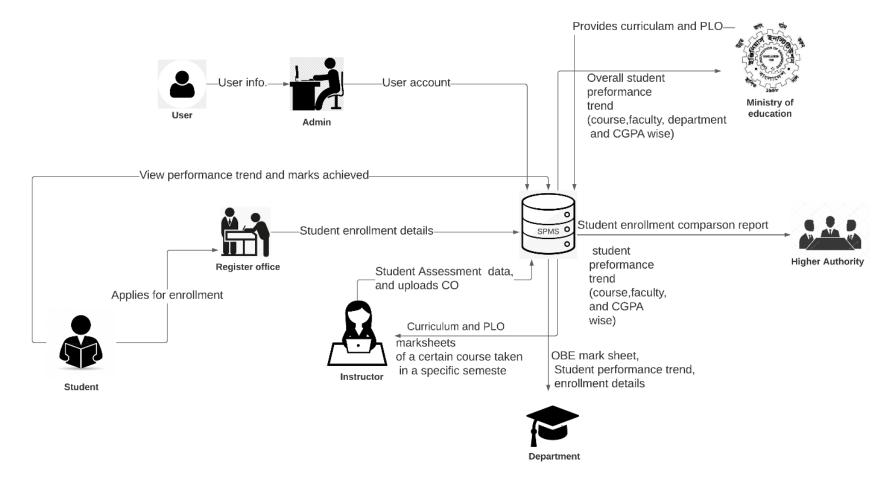


Figure 9: Rich Picture (TO-BE)

SECTION 2.6: PROCESSES ALONG WITH SIX ELEMENTS (TO-BE):

Process Name	Human	Non- Computing Hardware	Computing Hardware	Software	Database	Network & Communications
1) Student enrolment record	1) Enrolls in a certain Degree program. 2) Provides enrollment data to the register office Register Office: 1) Collects the enrolment data from the student 2) Keeps a copy of the data and inputs the data regarding student enrollment in a certain degree program on a specific semester in the SPMS. Higher Authority:	Pen and paper: Students may use provide the enrolment information manually	Computer / laptop: 1) Register office will collect, store and input the data by using a computer. 2) Users will use the computer to view the report. Database Server: Used by the register office and SPMS to store data. Networking	SPMS: Register office provides data to the software and the SPM software uses the information to automatically produce different graphical representations of the data which will show different comparison trends, e.g school-wise, department-wise, etc.	office collects the data and may store it in	The Internet is used to access SPMS as it is a web-based application

Login to SPMS to view the student enrollment comparison report.	Used Prov store enro info	ater, ach, ge, Hub): d to vide and e allment rmation		
	and SPM	to access		

2) Student Assessment Records	Instructor: 1) Login to SPMS via email and password 2) Click on the "Data Entry" button. A list courses taken by the instructor on a specific semester will appear 3) choose a specific course Input the marks and Input the marks for the students and save the data. 4) Here, the instructor can also view the data in a tabulated form.	Pen and Papers Are used by the students to give exams and submit assignments	used to access and input	SPMS are used by the instructor to record the assessment	All the assessment achieved by students are stored in the SPMS database	Internet: SPMS is web based it must be connected with internet

3) Create OBE Marksheet & Course Assessment Report	Instructor: Generate OBE marksheet and Assessment report by using SPMS 1) Login into SPMS 2) Select the "Student Performance Report" button on the dashboard. Mapped CO of every course taken by the instructor will appear and then specify the scope of the data. 3) Check the percentage of students with achieved COs and not achieved CO's in a graphical representation. Student: 1) Logins to SPMS 2) Clicks "Performance Report"	None	Computer is used to access the SPMS	Marksheets reports automatically using SPMS	and are by	SPMS PLO and CO achieved by students in every course are stored in SPMS database and the report are generated and saved in SPMS	
	renormance report						

tab and selects the desired course from the list of courses

3) Views OBE Marksheet in the browser and checks if CO is achieved or not. Export the data if required.

Higher Authority:

- 1) Login to SPMS Dashboard.
- 2) View different performance trends, searchable by year, courses, faculty, etc.

4) Analysis of Student Performance trends by Instructor	Instructor: 1) Logins to SPMS 2) Select "Student performance report "button and list will appear choose desired course check the OBE Marksheet of a specific course to view a student's past performance/overall course performance.	Paper To print hard copies of the marksheet	print hard	MS excel Instructor will login to SPMS and enter the marksheet id and semester name	All the neccesary documents are stored in SPMS database	Internet: Submission and Request Can be send via email
5) Overall Performance trend inspection	Instructor: Enters student assessment record and OBE marksheet. into SPMS. Higher Authority:	Paper: For Printing Hard copies of the reports	C	Microsoft Office: Can be used to make excel files to upload to the SPMS	SPMS: SPMS accesses the database and creates graphical representation of the data showing different trends.	Internet: Needed to access the web to send a copy of the reports as emails to their respective users

	Logins to SPMS to directly choose "student performance trend" option on the service tab check School-wise, department-wise, etc. report		reports to send them to their respective Department			
	Ministry of Education:					
	Logins to SPMS to directly choose "student performance trend" option on the service tab check School-wise, department-wise, etc. report					
6) Mapping of PLO's & CO's	Ministry of Education: 1) Login to the system and uploads the curriculum and PLOs under the OBE model for each program directly to the SPMS	None	Needed to enter the informations directly to SPMS	SPMS Ministry of Education and Instructor can login into the system and add information directly to SPMS	All the related information are stored in SPMS database	Internet: Needed to access the web to search the data

Instructor:			
1) Checks the course curriculum and PLO, reviews them and updates the new maped COs from the PLOs to SPMS			

SECTION 2.7: PROCESS DIAGRAM (TO-BE)

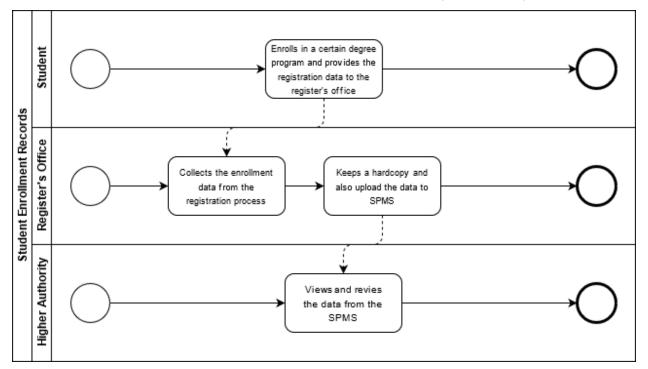


Figure 10: Process Diagram for Student Enrolment Records

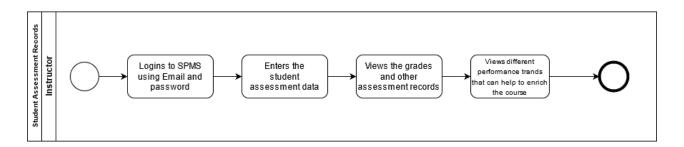


Figure 11: Process Diagram for Student Assessment Records

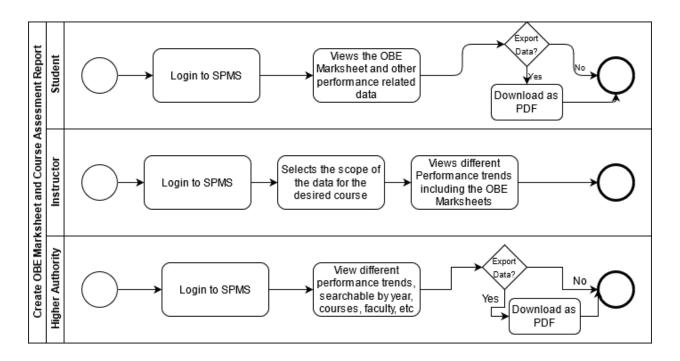


Figure 12: Process Diagram for Creating OBE Marksheet and assessment records.

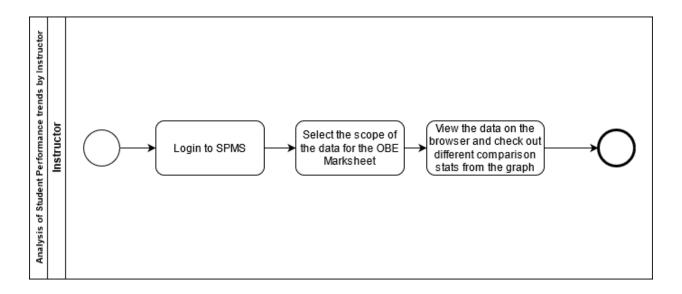


Figure 13:Process Diagram for Analysis of Student Performance Trends

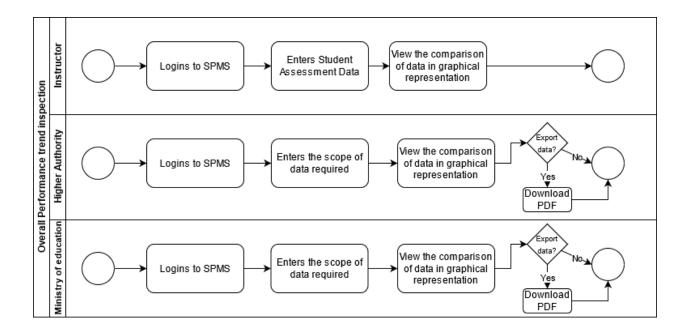


Figure 14: Process Diagram for Overall Performance Trend inspection.

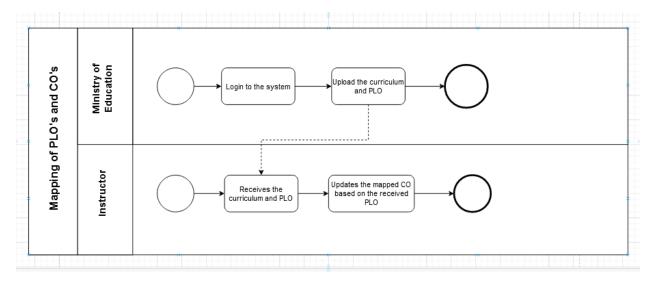


Figure 15: Process diagram for Mapping of PLOs and COs

CHAPTER 3: LOGICAL SYSTEM DESIGN

SECTION 3.1: BUSINESS RULE

We are building a software which will increase efficiency in monitoring the student performance and analyse data regarding student enrolment university. trend for Users can login via userID and password to the system. In a university a student gets enrolled under a specific Degree Program. Each Degree Program belongs to a department and the related departments are kept under schools. Courses are taught by instructors, departments are run by higher authorities (schools, department heads, school heads). A student will have a studentID, first name, last name, date of birth gender, phone number, departmentID, degreeprogramID. A department has departmentID, name and Higher AuthorityID. Enrolment has enrollmentID, studentID. Degree Programs will have degreeProgramID, degreeprogramname, departmentID. Instructors will have instrutorID, name, email, departmentID etc. They can have access to the and courses will have courseID, course name, degreeprogramID. courses

In our SPMS all data regarding student enrolment, student performance trend, PLO and CO are stored. Register office input the student enrolment data to the system. SPMS will generate a enrolment comparison report, (school, department, degree program wise). The Instructor will update the student assessment details and CO for each course to the SPMS, for the system to generate a student performance trend report (school-wise, department-wise, degree program-wise, Instructorwise, course-wise). The Ministry of Education has direct access to the system. They can view the student performance trend report and update the PLO, Instructor can map and update the CO according to the PLO. The student can view their student assessment details and Higher authority department comparison and can view the enrolment report.

SECTION 3.2: ERD

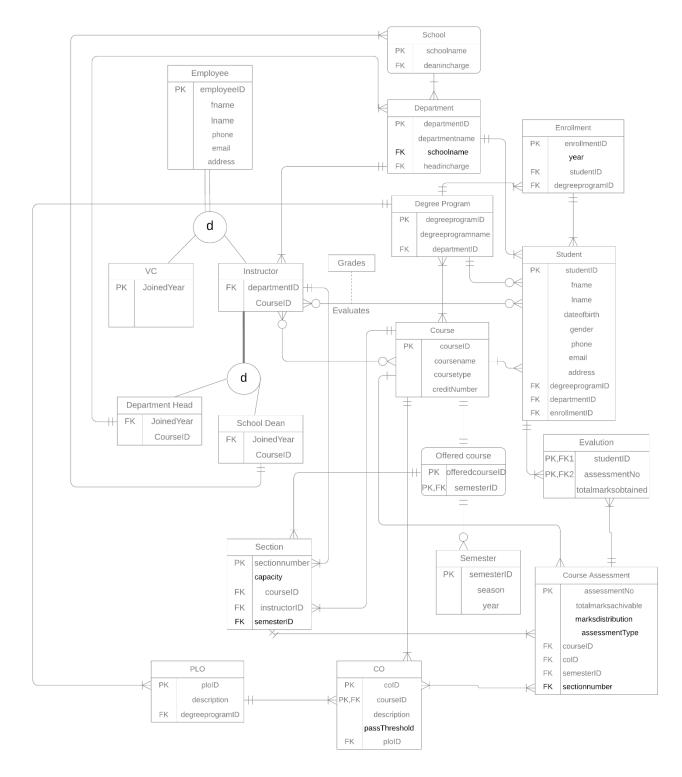


Figure 16: ERD

SECTION 3.3: ENTITY RELATIONSHIP DIAGRAM TO RELATIONAL SCHEMA

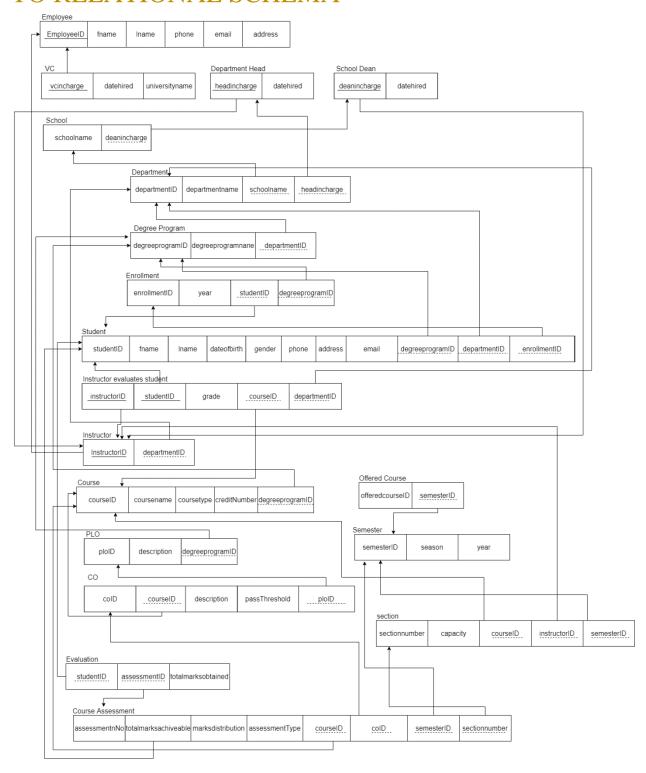


Figure 17: ENTITY RELATIONSHIP DIAGRAM TO RELATIONAL SCHEMA

SECTION: 3.4: NORMALIZATION

Functional Dependency

EmployeeID	fname,lname,phone,email,address
VC incharge	Datehired, university name
InstructorID,	EmployeeID,departmentID
Headincharge	datehired
Deanincharge	datehired
School	Schoolname, deanincharge
DepartmentID	Schoolname, departmentname
DegreeprogramID	Degreeprogramname, departmentID
StudentID	fname,lname,phone,dateofbirth,gender,email,address
CourseID	Coursename, coursetype,creditnumbet,departmentID
semesterID	Season, year
assesmentNo	CourseID,coID,semesterID,sectionnumber,assessmentType,obtainedmarks
coID	CourseID,description.ploID
enrollmentID	Year,studentID,degreeprogramID
ploID	Description, departmentID
sectionNo	Capacity,courseID,instructorID,semesterID
evaluation	StudentID, assessmentNo, obtained marks
courseofferedID	semesterID