



PROJECT REPORT
DATABASE MANAGEMENT
CSE 303
GROUP 23

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

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

The university has constantly supported the growth of educational institutions in Bangladesh and has created competent and knowledgeable scholars who have made advances both domestically and internationally. [1]

The University Grants Commission (UGC), the Ministry of Education, and other necessary institutions for each of the schools, along with regular curriculum updates, the implementation of a system to track student performance based on a quantified approach between course curriculum and standards set by UGC and the Bangladesh government, and ongoing student performance monitoring have all helped IUB achieve this. [1]

This report's main objective is to examine the student performance monitoring system that IUB currently employs, conduct the necessary process analysis, and recommend a new and better

system that reduces error, makes data analysis and report generation simpler for all interested parties, and produces/shows valuable information required for IUB and its collaborators to make the necessary changes to academia to produce better scholars. The first section explains the organization in issue and the project we undertook for it in detail. The second section introduces the proposed system that will take the place of the current system and concentrates on its flaws and shortcomings. The third and fourth sections will be highly technical and concentrate on how we intend to implement the suggested method.

During our investigation into the current system for tracking student performance, we identified several areas where beneficial changes could be made to speed up the monitoring of student performance processes, facilitate communication between key stakeholders, remove potential errors and data duplication, and most importantly, make it easier for all stakeholders to sort through large datasets and find the relevant information that they need.

We'll dive deeper into the workings of the current student performance monitoring system as we read this report, as well as the business procedures involved, where there are data management concerns and problems, and how we can create a better system to address these problems for fixing and improvement.

A. BACKGROUND OF THE ORGANIZATION- IUB:

One of the first private universities in Bangladesh, Independent University, Bangladesh (IUB), was founded in 1993. It is presently home to more than 7,048 undergraduate and graduate students as well as more than 10,455 alumni. Most experts project that this student population will increase by 10% a year. [2]

IUB has produced graduates with useful skills in the long run, and this is only possible because of its strict adherence to the ongoing curriculum and progress system. Concentrating efforts on the departments at IUB, and, transforming the department of computer and electrical science into a well-funded research hub that manages a number of research initiatives. IUB is also dedicated to developing future international-standard graduates who are primarily prepared to lead the nation's economy in new directions through skilled employment, entrepreneurship, and/or applied research. IUB was able to build cutting-edge lab facilities in their department thanks to the strong backing of the Bangladeshi government and the UGC. It is due to IUB's "Application Oriented Learning" ideology, which views education as a "application," and teaches students "not only the fundamental principles of learning, situation-handling, and have better overall perception by providing them with hands-on training sessions," why this is the case.

The SECS and the Department of Computer Science and Engineering at IUB have been continuously expanding their lab facilities and updating their curriculum to meet the demands of the market economy. They work closely with IEB, UGC, and the Ministry of Education to track their students' overall performance over specific periods by measuring their progress in various

courses through quantifiable assessments. These standards are set by IEB and the government and come in the form of Program Educational Objectives and Program Learning Outcomes for each department in an Accreditation Manual. Course instructors and coordinators map these objectives to specific courses, enabling stakeholders to assess the performance of students, faculties, courses, departments, and schools, and make necessary improvements.

B. BACKGROUND OF THE PROJECT SPMS 4.0:

Measuring the production of students, faculties, departments, and their individual classes to gauge productivity in relation to the course activities' relevance to the outcomes. Basically to offer a variety of tools and data to assist colleges, educational authorities like IEB, UGC, and other stakeholders in assessing student performance and informing improvement strategies. creating a national framework for outcome-based education while giving colleges a lot of latitude in putting local strategies into practice.

C. OBJECTIVE OF THE PROJECT SPMS 4.0:

Through a database of assessments, the SPMS 4.0 system tracks and analyzes the stakeholders' success, including pupils, faculties, schools, and departments. The system would be able to save individual assessment marks for evaluation reasons. (Midterm, quizzes, assignments, projects, presentations, and so on). Additionally, the system's database stores the results of those assessments in relation to the Course Outcomes (CO) and Program Learning Outcomes (PLO) to track the success of the student's faculties, schools, and departments.

Since they are the main stakeholders, students could track how well certain course goals statistically directly were met overall. Therefore, based on their performances and faculty evaluations, the higher stakeholders (Department Head and Administration) can assess and manage the extent to which various course outcomes targets and their accomplishments are understood by the student body as well as by departments, schools, and the university as a whole. SPSMS 4.0 also keeps track of how policies are performing in relation to the system's general administrative objectives. The system's primary goal is to use the database to track all actions at the university and to generate analytics for the head of the department, faculty, school, students, and their courses over a specified period. (Yearly and semester-wise).

D. SCOPE OF THE PROJECT:

We thoroughly analyzed the current system and identified areas where serious delays in time and communication can occur; these areas will be covered in more detail in the following chapter.

Our approach entails building a Web application called SPMS 4.0 (Student Performance Monitoring System 4.0) that makes use of a Relational Database Management System (RDMS) to store, edit, add, and update the data required to track student performance as well as for producing and archiving related OBE data, reports, and documents.

We produced potential users for the web-based SPMS 4.0 system and speculated how they would be using the system and the necessary information and data they would need access to. Since problems can arise from many points of all business processes, we will make custom user interfaces and login capabilities for all stakeholders who will also be the users of this system.

Since we use (RDBMS) for data storage, retrieving necessary files, tabular data, page layouts, and reports becomes incredibly easy and allows us to interact with the necessary data to occur in real time. We also create interfaces for all users to easily access these data and use them to generate and download reports.

We build an interface for faculties to be able to collaborate with each other on developing course outlines, course reports, mark sheets, assessments, mapping assessments to COs and PLOs for PLO achievements, and record assessments of students throughout the semester for all their courses.

Students, the IUB leadership team, and government agencies can also access the systems for drawing conclusions. Data will also be protected, and each stakeholder will be shown only that data, which is relevant to them, respectively.

CHAPTER 2 - REQUIREMENT ANALYSIS:

The Requirement Analysis is the means of using industry tools, methods, and standards, to research and visualizes the current system and the processes that go into the business operation of a certain organization. “Requirements Analysis is the process of determining what the database is to be used for. It involves interviews with user groups and other stakeholders to identify what functionality they require from the database, what kinds of data they wish to process, and the most frequently performed operations.” [4]

By doing this we can see each stakeholder and how they interact with each other. We use simple notations and symbols to give anyone an idea of how a business process works and dissect it accordingly.

As we will see, this process of analyzing lets us find out apparent and not-so-apparent problems with an existing system of monitoring student performance that is manual and depends on involving third-party actors and stakeholders causing errors in the system.

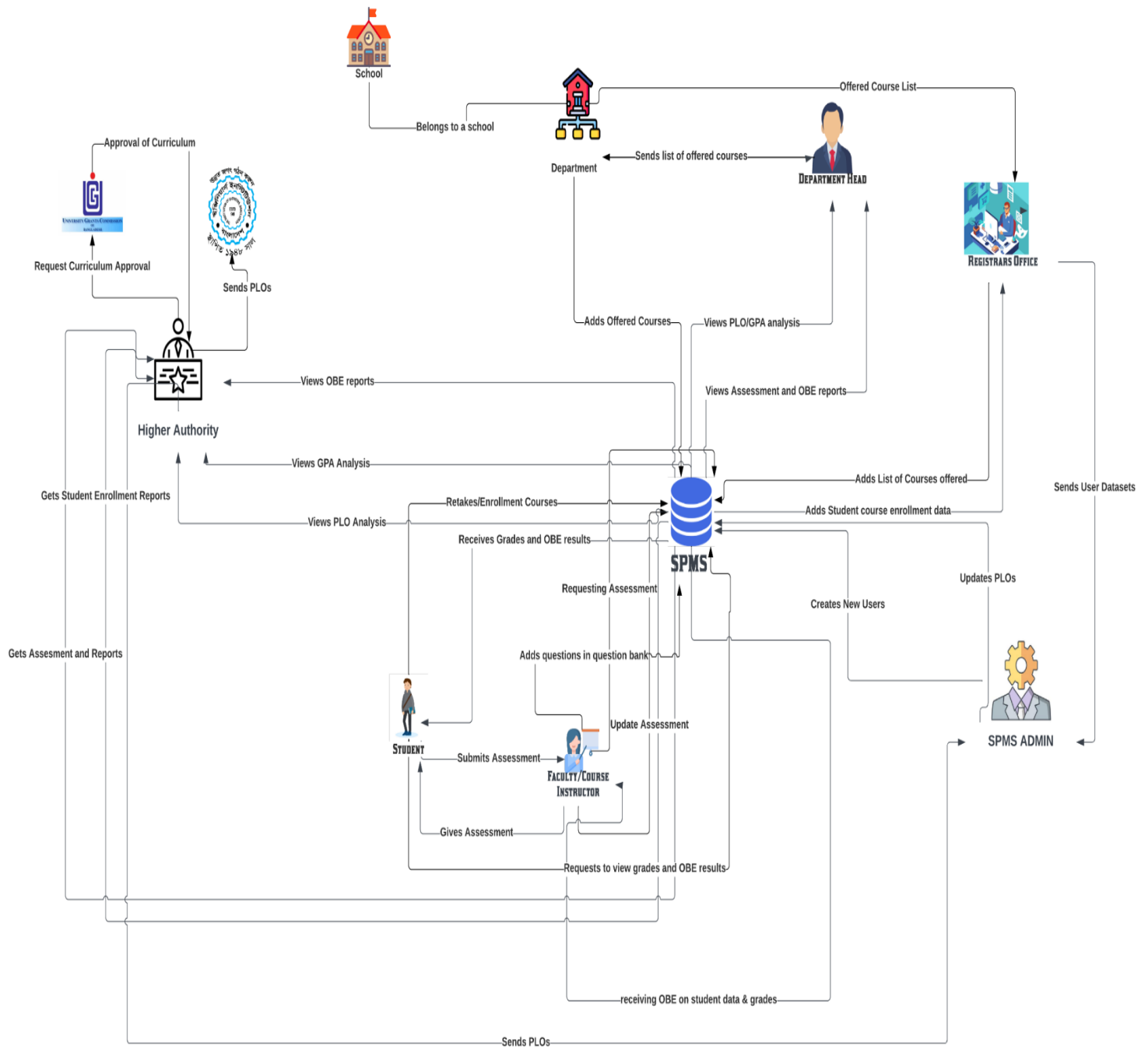
A. RICH PICTURE – EXISTING BUSINESS SYSTEM:

A Rich Picture is a way to explore, acknowledge and define a business process and express it through diagrams to create a preliminary mental model. A rich picture helps to open discussion and come to a broad, shared understanding of a situation. [5] The finished rich picture could be of value to other stakeholders of the problems in an existing system but also allows them to capture many different facets of the situation. Rich pictures concentrate on both the structure and the processes of a given situation. [6]

The Rich Picture Analysis also takes into account the following:

- Structures
- Processes
- Climate
- People
- Issues expressed by people.
- Conflict

As we can see, this rich picture was prepared to keep exactly those things in mind.



Processes along with Six System Element Analysis

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

SIX ELEMENT ANALYSIS – Existing System (SPMS 3.0): From the rich picture we can see that there are 9 key processes:

- 1) Creating storing and giving Course Outline
- 2) Add Questions to the question bank and grading the answer script
- 3) Course based student performance trend according to GPA
- 4) Faculty based student performance according to GPA
- 5) Course wise PLO achievement of a student
- 6) Student performance trend under VC/Dean/Head of Department
- 7) Course, Program, department, school CLO-PLO statistics
- 8) Course, student, department school wise expected vs achieved PLO
- 9) Department average of total PLO achieved and attempted students
- 10) Student Enrollment Statistics VC-wise, Dean-wise, Department Head-wise.

We can use six element analysis to analyze the impact of six elements in a process here the six elements are

1. Human
2. Non computing Hardware
3. Computing Hardware
4. Software.
5. Database.
6. Network and Communication.

Process	System Roles					
	Human	Non-Computing Hardware	Computing Hardware	Software	Database	Network and Communication
Creating Course Outline	<p>Faculty</p> <p>Ask the department office to provide the course materials from the previous semester.</p> <p>Create the Course Outline and give it to the students.</p> <p>Department Office</p> <p>Provide course materials to Faculty from the previous semester.</p> <p>Student</p> <p>Receive Course Outline from Faculty.</p>	<p>Pen and Paper</p> <p>User is supposed to need it to create a rough Course Outline.</p>	<p>Computer/ Laptop</p> <p>Users need a computer or a laptop to Use Google doc or MS office</p> <p>Networking Devices</p> <p>Need Internet for Google Doc if they use Google Doc</p> <p>Printer</p> <p>For print out the copies of course outline.</p>	<p>Google Doc / MS Office</p> <p>This software will be used for the store Grades in a Spreadsheet and create the assessment.</p>	<p>Storage</p> <p>Course Outlines are Stored Here.</p>	<p>Internet</p> <p>The Internet is used to access the software, logging in it and almost every other thing.</p>

<p>Adding question to question bank and Grading the Answer script</p>	<p>Faculty</p> <p>Login into the system using their Faculty ID and Password. Then set out inputs for their desired Course ID and Section that has to solve the question.</p> <p>Then provide information on the question in the question bank and assign it.</p> <p>Observe all submitted answers by the students and provide grades for it.</p> <p>Students</p> <p>Login into the System using their Student ID and Password. Then give answers to all questions assigned by the faculty and submit them.</p>		<p>Computer/ Laptop</p> <p>To access SPMS 3.0, the users need a computer or a laptop.</p> <p>Networking Devices</p> <p>Require Internet for the access</p> <p>Printer</p> <p>For print out the Report.</p>	<p>SPMS V3.0</p> <p>This software will be used for Store data and Provide the analyzed information.</p>	<p>SPM V3.0 Database</p> <p>In here data will be stored and updated</p>	<p>Internet</p> <p>For login and access to the SPMV3</p>
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Course based student performance trend according to CGPA	<p>Students</p> <p>Login into the System By giving their accounts Student ID and Password. then give Inputs for their course to View GPA.</p> <p>Department Head</p> <p>Login to the System By giving their accounts User ID and Password. then give Inputs for their wanted Course ID and time. Then they will see the student performance trend according to CGPA.</p> <p>Faculty</p> <p>Login into the System By giving their accounts Faculty ID and Password.</p> <p>Input their wanted CourseID and time, this going to depends on which courses</p>		<p>Computer/ Laptop</p> <p>Users need a computer or a laptop to access SPMS V2</p> <p>Networking Devices</p> <p>Need Internet for the access</p> <p>Printer</p> <p>For print out the Report.</p>	<p>SPM V3.0</p> <p>This software will be used for Store data and provide the analyzed information of Course based student performance trend according to CGPA</p>	<p>SPM V3.0 Database</p> <p>In here Course based student performance trend according to CGPA will be stored and updated</p>	<p>Internet</p> <p>For login and access to the SPMS V3</p>
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	<p>that faculty took.</p> <p>Then they will see his section's student performance trend according to CGPA.</p> <p>Dean/VC</p> <p>Login into the System using their User ID and Password. Then give Inputs for their wanted Course ID. Then they can view the student performance trend according to CGPA for a particular course.</p>					
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Faculty based student performance according to CGPA	<p>Faculty</p> <p>Login into the System using them Faculty ID and Password.</p> <p>Then give Inputs for their wanted CourseID and time, this going to Depends on which courses that faculty took.</p> <p>Then they will see his section's student performance.</p> <p>Dean/VC</p> <p>Login into the System By giving their accounts User ID and Password.</p> <p>Then give Inputs for their wanted Course ID.</p> <p>Then they will see the Faculty based student performance according to CGPA</p>		<p>Computer/ Laptop</p> <p>For logging into the SPMS 3.0, a computer needs to be used.</p> <p>Printer</p> <p>Used for printing hard copies of the progress of the students learnt by a faculty.</p>	<p>SPMS V3. 0</p> <p>Required to store student information into the database as well as generate a performance analysis graph using data from the database.</p>	<p>SPMS 3.0 Database</p> <p>Here all valid data are stored as well as updated, if necessary, by SPMS 2.0 admins</p>	<p>Internet</p> <p>Need to use for logging into SPMS 3.0</p>
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Course, Program , department, school CLO-PLO statistics	Students Login to the System By giving their accounts StudentID and Password. and Selects CLO-PLO statistics, then view the CLO-PLO statistics		Computer/ Laptop Users need a computer or a laptop to access SPMS 2.0 Networking Devices Need Internet for the access	SPM V3.0 This software will be used for Provide the analyzed information of CLO-PLO statistics.	SPM V3.0 Database Here CLO-PLO statistics will be stored and updated.	Internet For login and access to the SPM V3.0
	Department Head Login to the System By giving their accounts UserID and Password. and Selects CLO-PLO statistics, then view the CLO-PLO statistics		Printer For print out the Report.			
	Faculty Login to the System By giving their accounts facultyID and Password. and Selects CLO-PLO statistics, then view the CLO-PLO					
	Dean / VC					

	<p>Login to the System By giving their accounts UserID and Password.</p> <p>Selects CLO-PLO statistics</p> <p>then view the CLO-PLO statistics.</p>					
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<p>Course, student, department school wise expected vs achieved PLO</p>	<p>Dean/VC:</p> <p>Log into the system using ID and Password. View the achieved PLO of the students during the time that has been inserted. Then find out the comparison between expected and achieved PLO.</p> <p>Department Head:</p> <p>Log into the system using ID and Password. View the achieved PLO of the students during time entered that has been inputted and find the</p>		<p>Computer/ Laptop</p> <p>Used to log into SPMS 2.0</p> <p>Printer</p> <p>Need to print the hard copy of both the previous and current semester's achieved PLO in order to compare both of them.</p>	<p>SPMS 3.0</p> <p>For storing Data into the database as well as generate the performance analysis graph using data from the database.</p>	<p>SPMS 3.0 Database</p> <p>Here all valid data are stored as well as updated, if necessary, by SPMS 2.0 admins</p>	<p>Internet</p> <p>Used to log into SPMS 3.0</p>
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	<p>comparison between expected and achieved PLO.</p> <p>Faculty:</p> <p>Log into the system using ID and Password. View the achieved PLO of the students during inserted time that has been given and comparison between expected and achieved PLO.</p> <p>Student:</p> <p>Log into the system using ID and Password.</p> <p>View the achieved PLO of the students during inserted time that has been given and find the comparison between expected and achieved PLO.</p>					
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Department average of total PLO achieved and attempted by students	Student Login to the System By giving their accounts StudentID and Password. Select the semester to review the PLO reports of the courses taken in that semester.		Computer/ Laptop Users need a computer or a laptop to access SPMS 2.0 Networking Devices Need Internet for the access Printer For printing out the Report.	SPM V3.0 This software will be used for Provide the analyzed information of Department average of total PLO achieved and attempted by students	SPM V3.0 Database Here the average of total PLO achieved will be stored and updated.	Internet For login and access to the SPMV3.0
	Faculty Login to the System By giving their accounts facultyID and Password. Then they will select the semester to review the PLO reports of the students that the faculty had that semester.					
	SPMS V2 Admin Updates the PLO reports of the students.					
	Higher Authorities					

	Sends the necessary PLO information needed to be completed by the students to the SPMS V2.0 Admin.					
Student Enrollment Statistics VC-wise, Dean wise, Department Ent Head wise.	<p>VC / Dean /Department Head</p> <p>Login to the System By giving their accounts User ID and Password.</p> <p>Then give Inputs in Student Enrollment Statistics and choose the Year and Semester options. Then they will see the Student Enrollment Statistics for that Year and Semester.</p>		<p>Computer/Laptop:</p> <p>Users need a computer or a laptop to access SPMS 3.0</p> <p>Networking Devices</p> <p>Need Internet for the access</p> <p>Printer</p> <p>Required for printing out the Report</p>	<p>SPMS 3.0:</p> <p>This software will be used for</p> <p>Store data and Provide the analyzed information on Student Enrollment Statistics.</p>	<p>SPMS 3.0 Database:</p> <p>Here Student Enrollment Statistics will be stored and updated.</p>	<p>Internet:</p> <p>For login and access to the SPMS 3.0</p>

Course wise PLO achievement of a student	<p>Student</p> <p>Login to the System By giving their accounts StudentID and Password. Then give Inputs for their achieved PLOs and how many more they must achieve to complete the course to View.</p>		<p>Computer/ Laptop</p> <p>Users need a computer or a laptop to access SPMSV3</p> <p>Networking Devices</p> <p>Need Internet for the access</p> <p>Printer</p> <p>For print out the Report</p>	<p>SPMV3</p> <p>This software will be used for store data Provide the analyzed information of Course wise PLO achievement of a student</p>	<p>SPMV3 Database</p> <p>In here Course wise PLO achievement of a student will be stored and updated.</p>	<p>Internet</p> <p>For login and access to the SPMV3</p>
	<p>Faculty</p> <p>Login to the System By giving their accounts FacultytID and Password.</p> <p>Then give Inputs in PLO achievement for their wanted CourseID</p> <p>Then they will see the PLO achieved by the student for that particular course.</p>					
	<p>Department Head</p> <p>Login to</p>		<p>Computer/</p>			

	<p>the System By giving their accounts UserID and Password.</p> <p>Give Inputs in PLO achievement for their wanted CourseID Then they will see the PLOs achieved by the students.</p> <p>Dean/VC</p> <p>Login to the System By giving their accounts UserID and Password.</p> <p>give Inputs in PLO achievement for their wanted CourseID</p> <p>they will see the PLOs achieved by the students.</p>		<p>Laptop</p> <p>Users need a computer or a laptop to access SPMSV3</p> <p>Networking Devices</p> <p>Need Internet for the access</p> <p>Printer</p> <p>For print out the Report</p>			
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				SPMV3 This software will be used for Store data and provide the analyzed information of Student Enrollment Statistics.	SPMV3 Database In here Student Enrollment Statistics will be stored and updated	Internet For login and access to the SPMV3
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Existing Problems & Analysis of the problem

Based on the existing systems' Six Elements Analysis, the shortcomings in each process were identified. There is a repeating pattern in the far-right column of this table. It appears that the facilitation of a private online platform will improve the system in many ways.

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

			CO matrix, Bloom's Learning Level, etc.	stakeholders involved.
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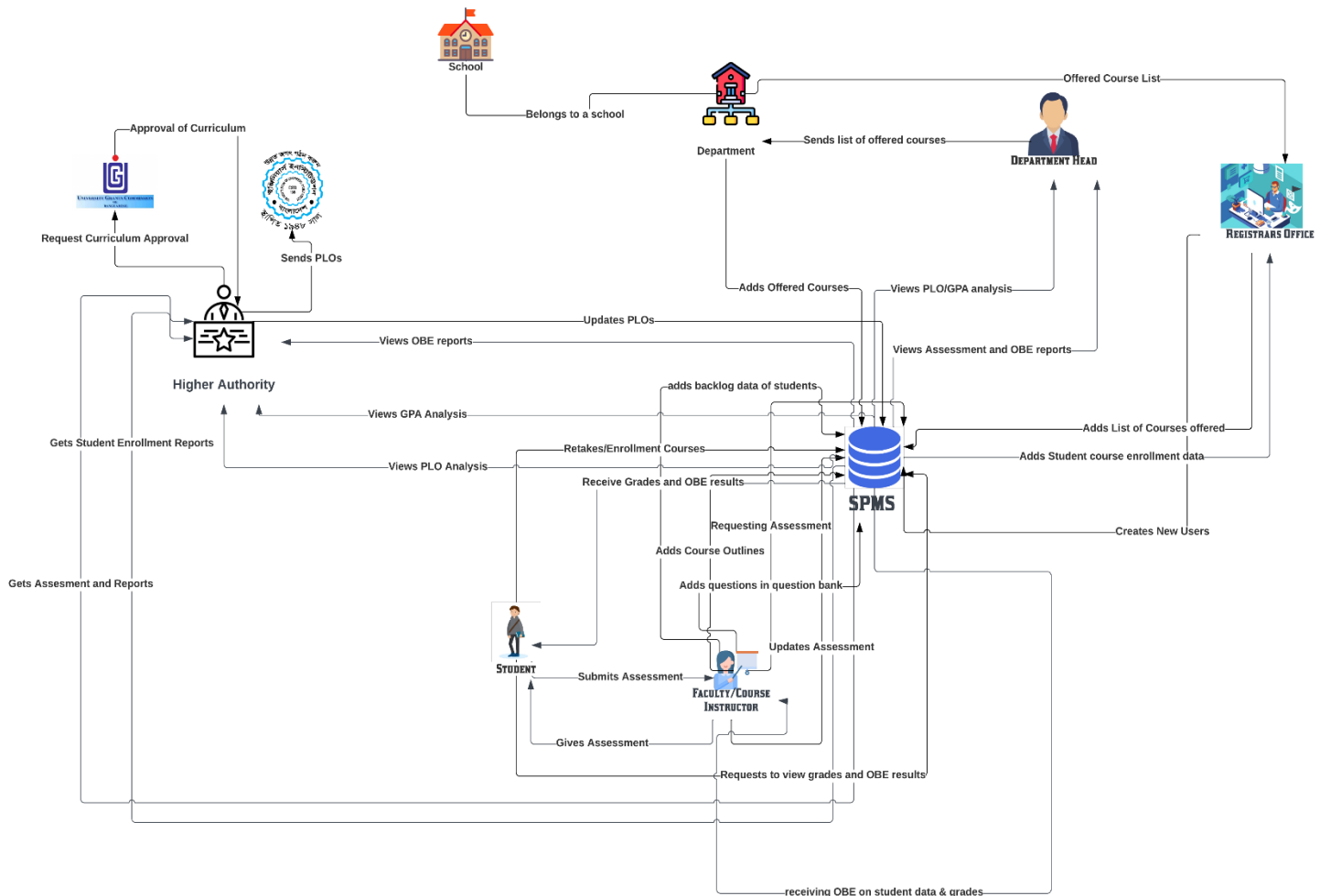
Student Enrollment	1. Student 2. Department Head 3. Registrar's office 4. Faculty 5. Dean 6. VC	School-wise, department-wise, and program-wise comparison of students have enrolled in each department with respect to a given period of time/semesters.	Student enrolled stats is recorded School, department and program-wise but was never compared with respect to time period/semester.	We want to keep the in the count of students enrolled along with a visual comparison of the student stats as per school-wise, department-wise, and program-wise and semester-wise.
Student performance based on CGPA	1. Student 2. Department Head 3. Registrar's office 4. Faculty 5. Dean 6. VC	School-wise, department-wise, and program-wise student performance trends based on CGPA with respect to a given period of time/semesters.	Students and other mentioned stakeholders have been able to only observe the CGPA status that gets updated every semester individually.	Our system should be allowing the users to statistically analyze the CGPA progress of the students not only on individually but also based on schools, department, and program with respect to a given period of time/semesters.
Course-wise student performance based on GPA.	1. Student 2. Department Head 3. Registrar's office 4. Faculty 5. Dean 6. VC	Course-wise (for a selection of courses) student performance trend based on GPA with respect to a given period of time/semesters.	The GPA of the students were used as verdicts only and never visualize into course-wise student's performance based of their GPA.	Through the software application the Stakeholders would be able to select the course and view performance trend depending on the GPA with respect to a given period of time/semesters.
Selective Number of Instructor-wise student	1. Department Head 2. Registrar's office	Instructor-wise (for a selection of instructors) student performance trend based on the GPA of	Higher Authorities have been unable to observe the statistics of their selective faculties performances all	The SPMS2.0 system would allow to record the GPA of the students taught by the selective number of faculties.

performance based on the GPA of the students	3. Faculty 4. Dean 5. VC	the students in that courses taught by each of the instructors so far with respect to a given period of time/semesters.	together based on the GPA of the students.	Storing and converting the data to appropriate graphical forums and measure performance of the instructors with respect to a given period of time/semesters. with respect to a given period of time/semesters.
VC-wise, dean-wise, or department head-wise student performance	1. Student 2. Department Head 3. Registrar's office 4. Faculty 5. Dean 6. VC	VC-wise, dean-wise, or head-wise student performance trend based on the GPA of the students under the school/program corresponding to the leadership team.	Higher authority (VC/Dean and Department Head) was unable to view VC, Dean or Department Head-wise student's performance under school/program.	The system would Will be able to visualize the performance of the students based on VC, Dean and Department-head.
Instructor-wise student performance based on the GPA of the students	1. Department Head 2. Registrar's office 3. Faculty 4. Dean 5. VC	Instructor-wise student performance trend for a chosen course with respect to a given period of time/semesters.	Higher authorities were not able to monitor Instructor performance for a selected number of faculty based on the GPA of the students they have taught.	The SPMS2.0 system would allow the stakeholders to record the GPA of the students taught by the selective faculty. Storing and converting the data to appropriate graphical forms and measure performance of the instructors with respect to a given period of time/semesters.
Total PLO percentage achieved and attempted by the student along with	1. Student 2. Department Head 3. Registrar's office 4. Faculty 5. Dean	PLO total percentage score for each PLO calculated from the scores achieved in each CO associated with the corresponding PLO among all the courses the student has	The PLO and corresponding CO for all the courses the student has done so far is never compared cumulatively along the departmental	The system will provide the total of all PLO percentage corresponding to CO and calculate the score for all the courses a student has done for a

the departmental average	6. VC	done so far, along with the departmental average performance for comparison. Also, for each PLO, what percentage of it was achieved from each of the courses associated with the corresponding PLO, and what percentage was achieved via each of all the COs associated with the corresponding PLO. All of this for a chosen school, program, or department.	average performance.	chosen school, program, or department.
PLO achievement	1. Student 2. Department Head 3. Registrar's office 4. Faculty 5. Dean 6. VC	PLO achievement of a student for each of the courses taken so far.	Students are unable to monitor progress of their PLO achieved for respective courses as it only available to the faculties and has access to rest of the higher authorities.	Record and tabulate the number of PLO's achieved by the student for individual course taken and completed so far.
Comparison of PLO-achieved percentage versus PLO-attempted	1. Student 2. Department Head 3. Registrar's office 4. Faculty 5. Dean 6. VC	Comparison of PLO-achieved percentage versus PLO-attempted percentage.	Students are unable to compare progress of their PLO achieved vs PLO they should be aiming for with respect to courses they have done as it only available to the faculties and is analyzed manually and can be extremely time consuming.	The system would allow the students and rest of the stakeholders to monitor automatically using relational data model using proper SQL operations- their PLO achieved vs attempted comparisons individually.
Expected PLO-achievement versus actual score (For	1. Student 2. Department Head 3. Registrar's office	Comparison of a course's, student's, department's, program's, or school's expected PLO-achievement	The existing system allows to calculate manually and does not provide adequate information for	SPM software would allow the stakeholders to monitor automatically (login into the system)

course's, student's, department's, program's, or school's)	4. Faculty 5. Dean 6. VC	versus actual with respect to a given period of time/semesters.	comparisons of PLO. The verdict is filled up in an Excel sheet and is time consuming for the stakeholders to reach to respective faculties or department head for OBE mark sheet.	their PLO achieved vs attempted comparisons for course's, program's, departments, and school with respect to a given period of time/semesters.
CO-PLO achievement summary	1. Student 2. Department Head 3. Registrar's office 4. Faculty 5. Dean 6. VC	Summary of CO-PLO achievement stats for a chosen course, program, department, school.	The existing system by far was abled the higher authorities only to track CO and PLO achieved for a course manually only.	SPM in a table will provide PLO-CO achievement stats to the stakeholders to choose for course wise, program, department, and school wise.

RICH PICTURE – PROPOSED SYSTEM (SPMS 4.0):



SIX ELEMENT ANALYSIS – PROPOSED SYSTEM (SPMS 4.0):

From the rich picture we can see that there are 9 key processes:

- 1) Creating storing and giving Course Outline
- 2) Add Questions to the question bank and grading the answer script
- 3) Course based student performance trend according to GPA
- 4) Faculty based student performance according to GPA
- 5) Course wise PLO achievement of a student
- 6) Student performance trend under VC/Dean/Head of Department

- 7) Course, Program, department, school CLO-PLO statistics
- 8) Course, student, department school wise expected vs achieved PLO
- 9) Department average of total PLO achieved and attempted students
- 10) Student Enrollment Statistics VC-wise, Dean-wise, Department Head-wise.

We can use six element analysis to analyze the impact of six elements in a process here the six elements are

1. Human
2. Non computing Hardware
3. Computing Hardware
4. Software.
5. Database.
6. Network and Communication.

Process	Human	Non-Computing Hardware	Computing Hardware	Software	Database	Network and Communication
Displaying the calculated course outcome percentage	Faculty: Logs in successfully using ID and password. Evaluate the marks which are obtained by the students in their internal exams, university exams, and internal assessment matrices		Computer For entering the website as well as calculating percentages of course outcomes, we need to use a computer. Moreover, the course outcome percentage can be displayed.	SPMS 4.0 Required for displaying the percentage of course outcome. Operating system	SPMS 4.0 Database To view, the calculated percentage of course outcome will be stored here.	Internet: For login and access to the SPMS 4.0 We need to use the internet for displaying the calculated percentage of course outcomes.

	<p>such as quizzes, seminars, presentations , mini projects, assignments, etc. which are provided by higher authority.</p> <p>Calculate and return the percentage of course outcome.</p> <p>They can view the outcome and observe the performance of students.</p> <p>Higher Authority:</p> <p>They provide data and all surveys which are needed to calculate the percentage of course outcomes to the faculty.</p> <p>They can view the percentage of course outcomes to observe the performance of students.</p> <p>Student:</p> <p>They can view their percentage</p>			<p>Users can use any operating system like Windows, Mac, Linux, etc.</p>		
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	<p>of course outcomes based on their obtained grades.</p> <p>They can view their obtained number of all quizzes, seminars, presentations, mini projects, assignments, etc., and observe their learning outcome.</p> <p>They can improve to achieve better grades, results, and skills.</p>					
Calculating and mapping the course outcome percentage based on the obtained grades	Faculty: <p>Logs in successfully using ID and password.</p> <p>They evaluate the marks which are obtained by the students in their internal exams, university exams, and internal</p>	Pen & Paper <p>Course outcome is mapped by using pen and paper.</p>	Computer: <p>For entering the website as well as calculating percentages and mapping course outcomes, we need to use a computer.</p> <p>Moreover, the course outcome percentage can be viewed.</p>	SPMS 4.0 <p>Required for updating percentage and mapping.</p> <p>Operating system</p> <p>Users can use any operating system like Windows,</p>	SPMS 4.0 Database <p>The calculated percentage as well as the mapping of course outcome will be stored here.</p>	Internet <p>For login and access to the SPMS 4.0.</p> <p>We need to use the internet for uploading the percentage and mapping.</p>

	<p>assessment matrices such as quizzes, seminars, presentations , mini projects, assignments, etc. at first. Later they calculate the percentage of course outcome. The calculations are based on data and surveys collected from the higher authorities.</p> <p>Higher Authority</p> <p>They provide data and all surveys which are needed to calculate the percentage of course outcomes to the faculty.</p> <p>Student</p> <p>They can view their percentage of course outcomes based on their obtained grades.</p>			Mac, Linux, etc.		
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Adding new data fields to the existing web application	Faculty: Logs in successfully using ID and password.	Pen & Paper Need to use pen and paper for taking notes of all new data fields that are required to add to the existing web application.	Computer For entering the website as well as creating new data fields, we need to use a computer. Moreover, the existing web application as well as the updated application can be viewed by using a computer.	SPMS 4.0 Required for updating new data fields in the already existing web application. Operating system Users can use any operating system like Windows, Mac, Linux, etc.	SPMS 4.0 Database All the created/added new data fields will be stored here.	Internet For login and access to the SPMS 4.0 website.
Creating storing and giving Course Outline	Faculty: Logs in successfully using ID and password. Ask the department office to provide the course materials from the previous semester. Create the Course Outline and	Pen and Paper: The user is supposed to need it to create a rough Course Outline.	Computer/Laptop: Users need a computer or a laptop to use Google docs or MS office. Networking Devices: Need Internet for Google Docs if they use Google Docs Printer:	Google Doc / MS Office: This software will be used to store grades in a Spreadsheet and create the assessment.	SPMS 4.0 Database: Course Outlines are Stored here.	Internet: The Internet is used to access the software, log in to it, and almost every other thing.

	<p>give it to the students.</p> <p>Department Office</p> <p>Provide course materials to Faculty from the previous semester.</p> <p>Student</p> <p>Receive Course Outline from Faculty.</p>		<p>Print out copies of the course outline.</p>			
--	--	--	--	--	--	--

<p>Student performance trend under VC/Dean/Head of Department</p>	<p>Department Head</p> <p>Login to the System By giving their accounts User ID and Password.</p> <p>Then give Inputs to see student performance under them.</p> <p>Dean</p> <p>Login to the System By giving their accounts User ID and Password.</p> <p>Then give Inputs with name and department ID to look for the department head.</p> <p>Then they will see the student performance under them.</p> <p>VC</p> <p>Login to the System By giving their accounts User ID and Password.</p> <p>Then give Inputs with name and department</p>		<p>Computer/Laptop:</p> <p>Users need a computer or a laptop to access SPMS 3.0</p> <p>NetworkingDevices:</p> <p>Need Internet for the access</p> <p>Printer:</p> <p>Required for printing out the Report.</p>	<p>SPMS 4.0:</p> <p>This software will be used for</p> <p>Store data and Provide the analyzed information on Student Performance</p>	<p>SPMS 4.0 Database:</p> <p>In here student performance will be stored and updated</p>	<p>Internet:</p> <p>For login and access to the SPMS 4.0</p>
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	<p>ID or School ID to look for the department head Or Dean.</p> <p>Then they will see the student performance under them.</p>					
<p>Student Enrollment Statistics VC-wise, Dean-wise, Department Head-wise</p>	<p>VC / Dean /Department Head</p> <p>Login to the System By giving their accounts User ID and Password</p> <p>Then give Inputs in Student Enrollment Statistics and choose the Year and Semester options. Then they will see the Student Enrollment Statistics for that Year and Semester.</p>		<p>Computer/Laptop:</p> <p>Users need a computer or a laptop to access SPMS 3.0</p> <p>Networking Devices</p> <p>Need Internet for the access</p> <p>Printer</p> <p>Required for printing out the Report</p>	<p>SPMS 4.0:</p> <p>This software will be used for</p> <p>Store data and Provide the analyzed information on Student Enrollment Statistics.</p>	<p>SPMS 4.0 Database:</p> <p>Here Student Enrollment Statistics will be stored and updated.</p>	<p>Internet:</p> <p>For login and access to the SPMS 4.0</p>
<p>Course-based student performance trend</p>	<p>Students:</p> <p>Login to the System By giving their</p>		<p>Computer/Laptop:</p>	<p>SPMS 4.0:</p> <p>This software will be</p>	<p>SPMS 4.0 Database</p> <p>Here Course based</p>	<p>Internet:</p>

<p>according to CGPA</p>	<p>accounts Student ID and Password.</p> <p>then give Inputs for their course to View CGPA.</p> <p>Department Head</p> <p>Login to the System By giving their accounts User ID and Password.</p> <p>then give Inputs for their wanted Course ID and time</p> <p>Then they will see the student performance trend according to CGPA</p> <p>Registrar's Office:</p> <p>Login to the System By giving their accounts Admin ID and Password.</p> <p>then give Inputs for their wanted Course ID and time</p> <p>Then they will see the</p>		<p>Users need a computer or a laptop to access SPMS 3.0</p> <p>Networking Devices:</p> <p>Need Internet for the access</p> <p>Printer:</p> <p>Print out the Report.</p>	<p>used for Store data and provide the analyzed information on Course based student performanc e trends according to CGPA</p>	<p>student performance trends according to CGPA will be stored and updated</p>	<p>For login and access to the SPMS 4.0</p>
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	<p>student performance trend according to CGPA</p> <p>Faculty:</p> <p>Login to the System By giving their accounts Faculty ID and Password.</p> <p>Then give Inputs for their wanted Course ID and time, This going to Depends on which courses the faculty took. Then they will see his section's student performance trend according to CGPA.</p> <p>Dean/VC:</p> <p>Login to the System By giving their accounts User ID and Password.</p> <p>Then give Inputs for their wanted Course ID.</p> <p>Then they will see the student performance trend according to</p>					
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	CGPA for a particular course.					
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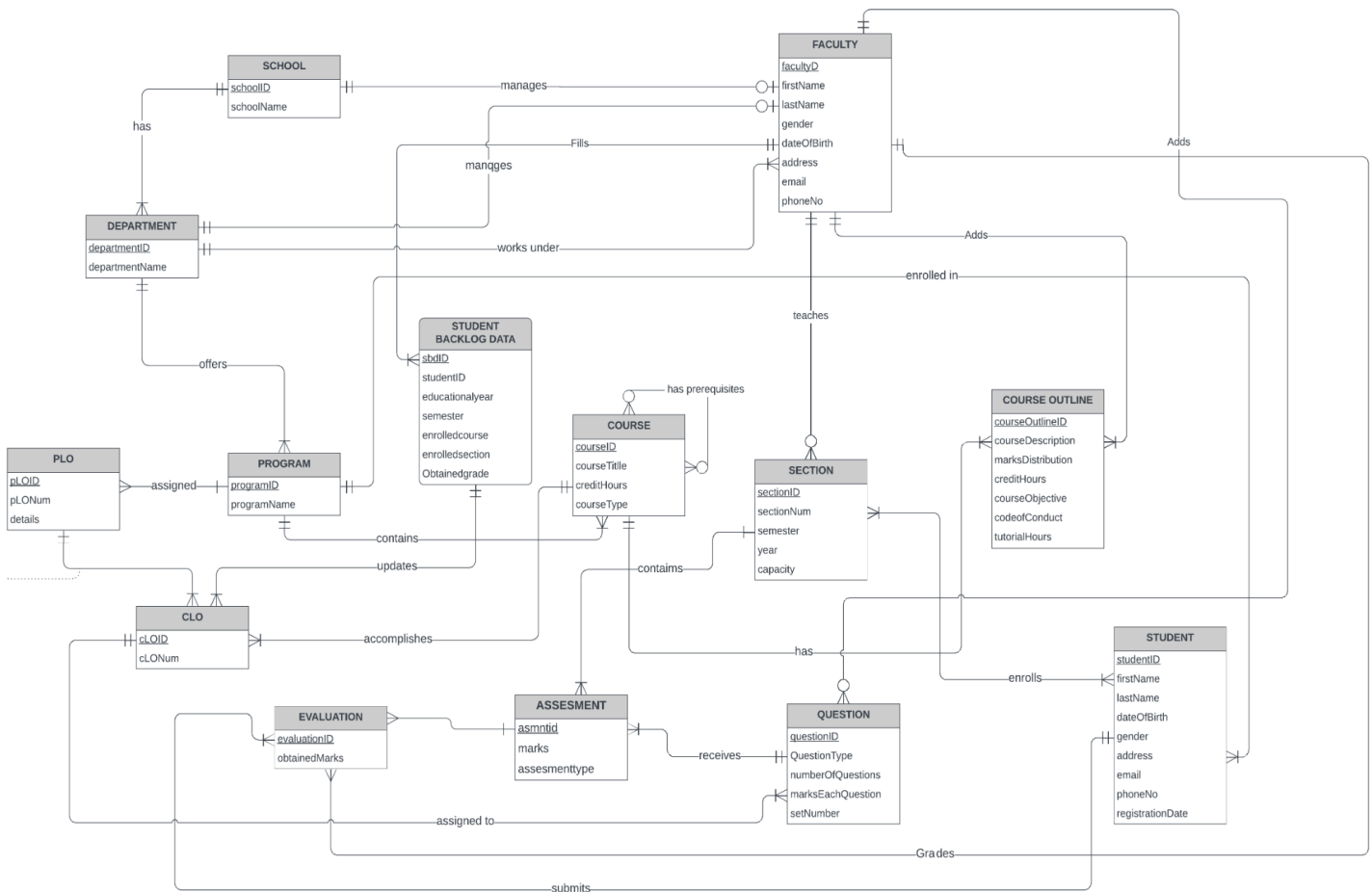
<p>Course-wise PLO achievement of a student</p>	<p>Students</p> <p>Login to the System By giving their accounts Student ID and Password.</p> <p>Then give Inputs for their achieved PLOs and how many more they must achieve to complete the course to View.</p> <p>Faculty</p> <p>Login to the System By giving their accounts Faculty ID And Password.</p> <p>Then give Inputs in PLO achievement for their wanted Course ID Then they will see the PLO achieved by the student for that particular course.</p> <p>Department Head</p> <p>Login to the System By</p>		<p>Computer/Laptop</p> <p>Users need a computer or a laptop to access SPMS 4.0</p> <p>Networking Devices:</p> <p>Need Internet for the access</p> <p>Printer:</p> <p>To print out the Report</p>	<p>SPMS 4.0</p> <p>This software will be used to store data Provide the analyzed information on the Course wise PLO achievement of a student</p>	<p>SPMS 4.0 Database</p> <p>Here Course wise PLO achievement of a student Will be stored and updated.</p>	<p>Internet</p> <p>For login and access to the SPMS 4.0</p>
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	<p>giving their accounts User ID and Password.</p> <p>then give Inputs in PLO achievement for their wanted Course ID Then they will see the</p> <p>PLOs achieved by the students.</p> <p>Dean/VC</p> <p>Login to the System By giving their accounts User ID and Password.</p> <p>then give Inputs in PLO achievement for their wanted Course ID Then they will see the PLOs achieved by the students.</p>					
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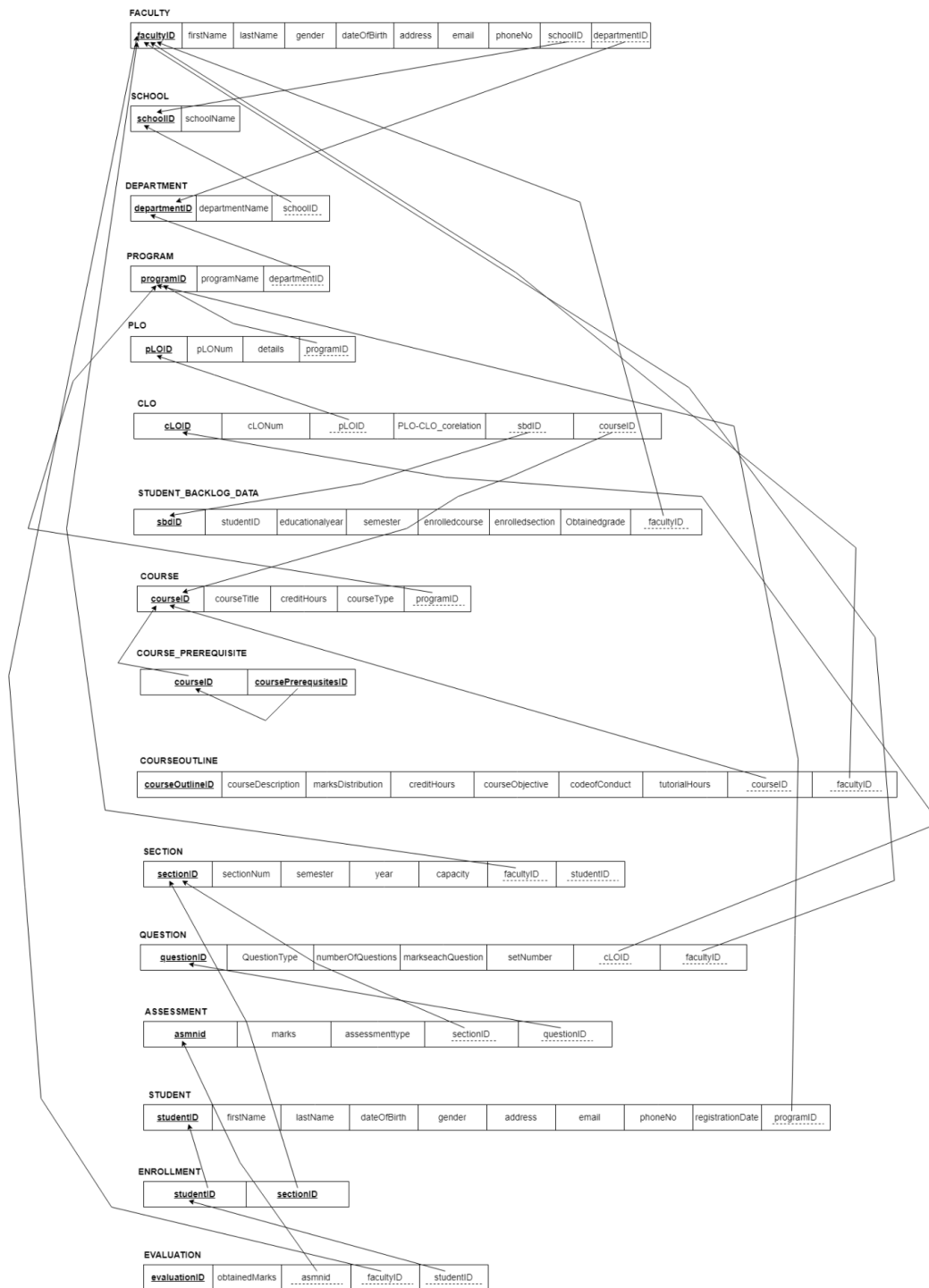
CHAPTER 3 -LOGICAL SYSTEM DESIGN:

Entity Relationship Diagram (ERD)

ENTITY RELATIONSHIP DIAGRAM



ENTITY RELATIONSHIP DIAGRAM TO RELATIONAL SCHEMA:



NORMALIZATION:

FACULTY (f)	<ol style="list-style-type: none">1. facultyID (f1)2. firstName (f2)3. lastName (f3)4. gender (f4)5. dateOfBirth (f5)6. address (f6)7. email (f7)8. phoneNo (f8)9. schoolID (sc1)10. departmentID (d1)
SCHOOL (sc)	<ol style="list-style-type: none">1. schoolID (sc1)2. schoolName (sc2)
DEPARTMENT (d)	<ol style="list-style-type: none">1. departmentID (d1)2. departmentName (d2)3. schoolID (sc1)
PROGRAM (pr)	<ol style="list-style-type: none">1. programID (pr1)2. programName (pr2)3. departmentID (d1)

PLO (p)	<ol style="list-style-type: none"> 1. pLOID (p1) 2. pLONum (p2) 3. details (p3) 4. programID (pr1)
CLO (c)	<ol style="list-style-type: none"> 1. cLOID (c1) 2. cLONum (c2) 3. plo-clo_corelation (c3) 4. ploOID (p1) 5. sbdID (sbd1) 6. courseID (cr1)
STUDENT_BACKLOG_DATA (sbd)	<ol style="list-style-type: none"> 1. sbdID (sbd1) 2. studentID (sbd2) 3. educationalyear (sbd3) 4. semester (sbd4) 5. enrolledcourse (sbd5) 6. enrolledsection (sbd6) 7. Obtainedgrade (sbd7) 8. facultyID (fl)
COURSE (cr)	<ol style="list-style-type: none"> 1. courseID (cr1)

	<ol style="list-style-type: none"> 2. courseTitle (cr2) 3. creditHours (cr3) 4. courseType (cr4) 5. programID (pr1)
COURSE_PREREQUISITE (cp)	<ol style="list-style-type: none"> 1. courseID (cr1) 2. coursePrerequisitesID (cp1)
COURSEOUTLINE (co)	<ol style="list-style-type: none"> 1. courseOutlineID (co1) 2. courseDescription (co2) 3. marksDistribution (co3) 4. creditHours (co4) 5. courseObjective (co5) 6. codeofConduct (co6) 7. tutorialHours (co7) 8. courseID (cr1) 9. facultyID (fl)
SECTION (st)	<ol style="list-style-type: none"> 1. sectionID (st1) 2. sectionNum (st2) 3. semester (st3) 4. year (st4)

	<ul style="list-style-type: none"> 5. capacity (st5) 6. facultyID (f1) 7. studentID (s1)
QUESTION (q)	<ul style="list-style-type: none"> 1. questionID (q1) 2. QuestionType (q2) 3. numberOfQuestions (q3) 4. marksEachQuestion (q4) 5. setNumber (q5) 6. cloID (c1) 7. facultyID (f1)
ASSESSMENT (a)	<ul style="list-style-type: none"> 1. asmntid (a1) 2. marks (a2) 3. assessmenttype (a3) 4. sectionID (st1) 5. questionID (q1)
STUDENT (s)	<ul style="list-style-type: none"> 1. studentID (s1) 2. firstName (s2) 3. lastName (s3) 4. dateOfBirth (s4) 5. gender (s5)

	6. address (s6) 7. email (s7) 8. phoneNo (s8) 9. registrationDate(s9) 10. programID (pr1)
ENROLLMENT (en)	1. studentID (s1) 2. sectionID (st1)
EVALUATION (ev)	1. evaluationID (ev1) 2. obtainedMarks (ev2) 3. asmntid (a1) 4. facultyID (f1) 5. studentID (s1)

f1 -> f2, f3, f4, f5, f6, f7, f8, sc1, d1

d1 -> d2, sc1

sc1 -> sc2

pr1 -> pr2, d1

p1 -> p2, p3, pr1

c1 -> c2, c3, p1, sbd1, cr1

sbd1 -> sbd2, sbd3, sbd4, sbd5, sbd6, sbd7, fl

$$\text{cr1} \rightarrow \text{cr2}, \text{cr3}, \text{cr4}, \text{pr1}$$

cp1 -> cr1

col -> co2, co3, co4, co5, co6, co7, cr1, fl

st1 -> st2, st3, st4, st5, f1, s1

q1 -> q2, q3, q4, q5, c1, f1

$$a1 \rightarrow a2, a3, st1, q1$$

s1 -> s2, s3, s4, s5, s6, s7, s8, s9, pr1

en1 -> s1, st1

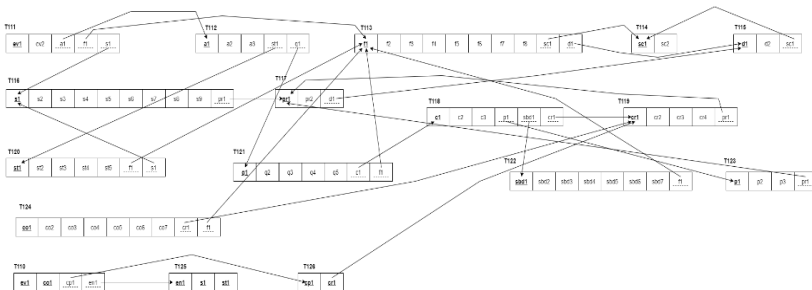
$$\text{ev1} \rightarrow \text{ev2}, a1, f1, s1$$

INE:

1. There will be no repeating groups.
2. At least one primary key is here.

2NF:

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



REGNE:

All relations are in UNF .

DATA DICTIONARY

FACULTY_T

Name	Data Type	Size	Remark
facultyID	INTEGER	4	This is the foreign key from the employee table. E.g. "3314"
departmentID	CHAR	10	This is the foreign key of the department he works for. E.g. "CSE"
rank	CHAR	20	This is the position of the faculty. E.g. "Senior Lecturer"
dateofjoining	DATE	DD MM YYYY	This is the date of joining for the faculty. E.g. "1/4/2020"

SCHOOL_T

Name	Data Type	Size	Remark
schoolID	CHAR	10	This is the primary key for the school table. E.g. "SETS"
schoolName	CHAR	30	This is the name of the school. E.g. "School of Engineering, Technology & Sciences"

DEPARTMENT_T

Name	Data Type	Size	Remark
departmentID	CHAR	10	This is the primary key for the department table. E.g. "CSE"
schoolID	CHAR	10	This is the foreign key from the school table. E.g. "SETS"

departmentName	CHAR	30	This is the name of the department. E.g. “Computer Science and Engineering”
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STUDENT T

Name	Data Type	Size	Remark
studentID	INTEGER	4	This is the primary key for the student table. E.g. “1910975”
departmentID	CHAR	10	This is the foreign key from the department table. E.g. “CSE”
programID	INTEGER	10	This is the foreign key from the program table. E.g.: “1”
firstName	CHAR	30	This is the first name of the student. E.g. “Naim”
lastName	CHAR	30	This is the last name of the employee. E.g. “Mobassir”
gender	CHAR	6	This is the gender of the student. E.g. “Male”
dateofBirth	DATE	DD MM YYYY	This is the birthdate of the student. E.g. “11/11/2001”
address	VARCHAR	60	This is the address of the student. E.g. “House-19, Road-4, Block-A,Bashundhara R/A,Dhaka-1229”
email	VARCHAR	30	This is the email of the student. E.g. “1910975@iub.edu.bd”
phoneNo	VARCHAR	11	This is the phone number of the employee. E.g. “01XXXXXXXXXX”

COURSE T

Name	Data Type	Size	Remark
courseID	VARCHAR	8	This is the primary key of the course table. E.g. “CSE203”
programID	INTEGER	10	This is the foreign key from the program table. E.g.: “1”
courseTitle	CHAR	30	This is the name of the course. E.g. “Data Structure”
creditHours	INTEGER	2	This is the number of credits in the course. E.g. “4”
courseType	CHAR	10	This is the type of course. E.g. “Core”

COURSE OUTLINE T

Name	Data Type	Size	Remark
courseoutlineID	VARCHAR	10	This is the primary key of the course outline table.
facultyID	INTEGER	4	This is the foreign key from the faculty table. E.g. “3314”
sectionID	INTEGER		This is the foreign key from the section table. E.g. “1”
courseDescription	MEDIUMTEXT		This gives a description about the course.
marksDistribution	MEDIUMTEXT		This gives a layout of how marks will be distributed.
creditHours	INTEGER	2	This is the number of credits in the course. E.g. “4”
courseObjective	MEDIUMTEXT		This gives an idea of what students will learn.
codeofConduct	MEDIUMTEXT		This describes the code of conduct to follow in the course.
tutorialhours	TIME	HH:MM	This is the time for a tutorial. E.g. “14:00-16:00”

PROGRAM T

Name	Data Type	Size	Remark
programID	INTEGER	10	This is the primary key of the program table. E.g. “1”
departmentID	CHAR	10	This is the foreign key from the department table. E.g. “CSE”
programName	CHAR	30	This is the name of the program. E.g. “Bachelor of Science”

STUDENT BACKLOG DATA T

Name	Data Type	Size	Remark
sbdID	VARCHAR	10	This is the primary key of the sbd. E.g. “41”
facultyID	INTEGER	4	This is the foreign key from the faculty table. E.g. “3314”
studentinfo	VARCHAR	60	This is for storing information about students.

SECTION T

Name	Data Type	Size	Remark
sectionID	INTEGER		This is the primary key for the section table. E.g. “1”
facultyID	INTEGER	4	This is the foreign key from the faculty table. E.g. “3314”
courseID	VARCHAR	8	This is the foreign key from the course table. E.g. “CSE203”
sectionNum	INTEGER	2	This is the section number. E.g. “2”
semester	CHAR	6	This is the semester session name. E.g. “Autumn”
year	YEAR	YYY Y	This is the year of registration. E.g.: “2020”

EVALUATION T

Name	Data Type	Size	Remark
evaluationID	INTEGER		This is the primary key for this table
questionID	VARCHAR		This is the foreign key from the question table.
registrationID	INTEGER		This is the foreign key from the registration table. E.g. “03414045”
obtainedMarks	INTEGER	3	This is the obtained marks in a particular evaluation. E.g. “75”

QUESTION T

Name	Data Type	Size	Remark
questionID	VARCHAR		This is the primary key for this table
cLOID	VARCHAR	11	This is the foreign key from the cLO table. E.g. “CLO2”
facultyID	INTEGER	4	This is the foreign key from the faculty table. E.g. “3314”

assessmentType	CHAR	10	This is the type of assessment. E.g. “Midterm”
numberOfQuestions	INTEGER	3	This is the number of questions. E.g. “5”
marksEachQuestion	INTEGER	3	This is the mark per question. E.g. “25”
setNumber	VARCHAR	5	This is the set number. E.g. “B”

REGISTRATION T

Name	Data Type	Size	Remark
registrationID	INTEGER		This is the primary key for the registration table. E.g. “03414045”
studentID	INTEGER	4	This is the foreign key from the student table. E.g. “1910975”
sectionID	INTEGER		This is the foreign key from the section table. E.g. “1”
semester	CHAR	6	This is the semester session name. E.g. “Autumn”
year	YEAR	YYY Y	This is the year of registration. E.g.: “2020”

PLO T

Name	Data Type	Size	Remark
pLOID	VARCHAR	11	This is the primary key for this table. E.g. “PLO1”
programID	INTEGER	10	This is the foreign key from the program table. E.g. “1”
pLOnum	INTEGER	1	This is the PLO number. E.g. “2”
details	MEDIUMTEXT		This contains details of the PLO.

CLO T

Name	Data Type	Size	Remark
cLOID	VARCHAR	11	This is the primary key for this table. E.g. “CLO2”
pLOID	VARCHAR	11	This is the foreign key from the PLO table. E.g. “PLO1”
courseID	VARCHAR	8	This is the foreign key from the course table. E.g. “CSE203”
cLOnum	INTEGER	1	This is the CLO number. E.g. “2”

CHAPTER 4 - PHYSICAL SYSTEM DESIGN

IUB SPMS

- MARKS ENTRY
- COURSE OUTCOME
- DISPLAY COURSE OUTCOME
- PLO ACHIEVEMENT
- FACULTY FEEDBACK

COURSE OUTCOME ENTRY

Course Outcome Entry

Co ID

Ex 101

Student Id

Ex 1928374

Year

Ex 2023

Semester

Ex Spring

Course

Ex CSE-101

Section

Ex 1

Grade

Ex A-

Choose CSV File

Submit

Total : 0

IUB SPMS

- MARKS ENTRY
- COURSE OUTCOME
- DISPLAY COURSE OUTCOME
- PLO ACHIEVEMENT
- FACULTY FEEDBACK

Select A Course

Select a Course

Submit

Average PLO Achivement

PLO	Achievement (%)
PLO-1	1.00%
PLO-2	7.00%
PLO-3	3.00%
PLO-4	9.00%
PLO-5	7.00%
PLO-6	5.00%

IUB SPMS

MARKS ENTRY

COURSE OUTCOME

DISPLAY COURSE OUTCOME

PLO ACHIEVEMENT

FACULTY FEEDBACK

Student Id

--select--

Course

--select--

Submit

Student Id	Year	Semester	Course	Grade	Percentage
1732428	2023	Spring	CSE-101	A	

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```

1  -- phpMyAdmin SQL Dump
2  -- version 5.1.1
3  -- https://www.phpmyadmin.net/
4  --
5  -- Host: 127.0.0.1
6  -- Generation Time: Apr 25, 2023 at 06:32 AM
7  -- Server version: 10.4.22-MariaDB
8  -- PHP Version: 8.1.2
9
10 SET SQL_MODE = "NO_AUTO_VALUE_ON_ZERO";
11 START TRANSACTION;
12 SET time_zone = "+00:00";
13
14
15 /*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
16 /*!40101 SET @OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS */;
17 /*!40101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION */;
18 /*!40101 SET NAMES utf8mb4 */;
19
20 --
21 -- Database: `group_4_database`
22 --
23
24 -- -----
25
26 --
27 -- Table structure for table `admin`
28 --
29
30 CREATE TABLE `admin` (
31   `serial` int(11) NOT NULL,
32   `id` int(11) NOT NULL,
33   `firstName` varchar(100) NOT NULL,
34   `lastName` varchar(100) NOT NULL,
35   `email` varchar(250) NOT NULL,
36   `password` varchar(200) NOT NULL
37 ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
38
39 --
40 -- Dumping data for table `admin`
41 --
42
43 INSERT INTO `admin` (`serial`, `id`, `firstName`, `lastName`, `email`, `password`) VALUES
44 (1, 1, 'admin', '', 'admin@gmail.com', '123456');
45
46 -- -----
47
48 --
49 -- Table structure for table `co`
50 --
51
52 CREATE TABLE `co` (
53   `serial` int(11) NOT NULL,
54   `courseId` varchar(100) NOT NULL,
55   `ploId` int(11) NOT NULL,
56   `co1` tinyint(1) DEFAULT NULL,
57   `co2` tinyint(1) DEFAULT NULL,
58   `co3` tinyint(1) DEFAULT NULL,
59   `co4` tinyint(1) DEFAULT NULL,
60   `co5` tinyint(1) DEFAULT NULL,
61   `co6` tinyint(1) DEFAULT NULL,
62   `co7` tinyint(1) DEFAULT NULL,
63   `co8` tinyint(1) DEFAULT NULL,
64   `co9` tinyint(1) DEFAULT NULL,

```

```
1
2  <?php
3      include '../php/include/conn.php';
4
5      //$course_Name = "";
6      //if(isset($_POST['submit'])){
7          $course_Name = $_POST["course"];
8      //}
9
10     // $query = "SELECT SUM(q1_co) AS m1, SUM(q2_co) AS m2,
11     //          SUM(q3_co) AS m3, SUM(q4_co) AS m4 ,
12     //          SUM(q5_co) AS m5, SUM(q6_co) AS m6
13     //          FROM marks_exam";
14     $query = "SELECT q1_co AS m1, q2_co AS m2,
15              q3_co AS m3, q4_co AS m4 ,
16              q5_co AS m5, q6_co AS m6
17              FROM marks_exam WHERE course_id='$course_Name'";
18     $result = $conn->query($query);
19
20     while($row = mysqli_fetch_array($result))
21     {
22         $dataPoints = array(
23             array("label"=>"PLO-1", "y"=>$row["m1"]),
24             array("label"=>"PLO-2", "y"=>$row["m2"]),
25             array("label"=>"PLO-3", "y"=>$row["m3"]),
26             array("label"=>"PLO-4", "y"=>$row["m4"]),
27             array("label"=>"PLO-5", "y"=>$row["m5"]),
28             array("label"=>"PLO-6", "y"=>$row["m6"]),
29         );
30     }
31
32
33
34
35  ?>
```

```

1
2 <?php
3 require '../php/include/check-conn.php';
4 include '../php/include/plo.php';
5
6 if(isset($_GET['id'])){
7     $id = $_GET['id'];
8     $sql = "SELECT * FROM marks WHERE studentId = $id";
9     $sMarks = $mysql->query($sql);
10
11     //course based total co marks
12     $cMarks = array();
13     $cTotal = array();
14     foreach($sMarks as $marks){
15         $course = $marks['course_id'];
16         for($i=1; $i<=10; $i++){
17             if(isset($marks["q"."$i."_co"]) && $marks["q"."$i."_co"]!=0){
18                 $co = $marks["q"."$i."_co"];
19                 if(isset($cMarks[$course][$co])){
20                     $cMarks[$course][$co] += $marks["q"."$i."_mark"];
21                     $cTotal[$course][$co] += $marks["q"."$i."_max"];
22                 }else{
23                     $cMarks[$course][$co] = $marks["q"."$i."_mark"];
24                     $cTotal[$course][$co] = $marks["q"."$i."_max"];
25                 }
26             }
27         }
28     }
29
30     $pMarks = array();
31     $pTotal = array();
32     foreach($cMarks as $c => $v){
33
34         $sql = "SELECT * FROM co WHERE course_id = '$c'";
35         $plos = $mysql->query($sql);
36         foreach($plos as $plo){
37             $pId = $plo['plo_id'];
38             for($i=1; $i<=10; $i++){
39                 if(isset($plo["co"."$i"]) && $plo["co"."$i"]==1){
40                     if(isset($pMarks[$c][$pId])){
41                         $pMarks[$c][$pId] += $cMarks[$c][$i];
42                         $pTotal[$c][$pId] += $cTotal[$c][$i];
43                     }else{
44                         $pMarks[$c][$pId] = $cMarks[$c][$i];
45                         $pTotal[$c][$pId] = $cTotal[$c][$i];
46                     }
47                 }
48             }
49         }
50     }
51
52     //total marks in plo
53     $pfMarks = array();
54     $pfTotal = array();
55     foreach($pMarks as $c => $v){
56         foreach($v as $i => $j){
57             if(isset($pfMarks[$i])){
58                 $pfMarks[$i] += $j;
59                 $pfTotal[$i] += $pTotal[$c][$i];
60             }else{
61                 $pfMarks[$i] = $j;
62                 $pfTotal[$i] = $pTotal[$c][$i];
63             }
64         }
65     }
66
67     //student info
68     // $sql = "SELECT * FROM user WHERE id = $id";
69     $sql = "SELECT * FROM user WHERE id = 1416455";
70     $student = $mysql->query($sql)->fetch_assoc();
71     //total plo
72     $sql = "SELECT * FROM plo WHERE programId = '". $student['programId']. "'";
73     $ploNum = $mysql->query($sql)->num_rows;
74
75     $color = ["", "#1FE7C4", "#E45C17", "#06B97B", "#8CE026", "#E1CCFF", "#5BA2CC", "#0A2E82", "#957107", "#80CF18"];
76 }
77 ?>

```

Conclusion

The analysis phase of the project involved developing assumptions and queries based on the rich picture and six element analysis of the organization's operations. The team has recognized the importance of conducting thorough analysis and gathering feedback from stakeholders to improve the project. The addition of new features and focus on deployment will help to enhance the overall effectiveness of the software.

The team has tried to produce the best possible program given the time and resources available. We acknowledge the limitations of the current program and suggest future improvements highlighting the potential impact of the software on education institutions. It can help students become better scholars, enable faculties to keep better track of their students, adjust their teaching strategies accordingly, and help institution members to manage their resources more effectively.

With more tools and information, the team could produce even more accurate outcomes, representations, and predictions. The future development plans include adding more users to the program and a new feature that predicts a candidate's grade based on prior grades and performances.