DATABASE MANAGEMENT PROJECT

STUDENTS PERFOMANCE MONITORING SYSTEM

TEAM: FAILURE DATABEES

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TABLE OF CONTENTS

CHAPTER-I INTRODUCTION

BACKGROUND OF THE ORGANIZATION - IUB:

IUB is a private university in Bangladesh which was established in 1993. It has a current enrollment of around 10 000 at undergraduate and graduate levels. More than 450 highly qualified and highly skilled faculty members who are exceptionally good at their department of teaching and where at least half of them are PhD degree holders. IUB also has an alumni strength of nearly 14000 people. There are currently 5 academic schools in IUB.

1) School of Business & Entrepreneurship

2) School of Engineering, Technology and Sciences

3) School of Environment & Life Sciences

4) School of Liberal Arts & Social Sciences

5) School of Pharmacy and Public Health

BACKGROUND OF THE PROJECT - SPMS 4.0:

Student Performance Monitoring System (SPMS 3.0) is a framework for Outcome-Based Education (OBE). It evaluates the performance of students, course instructors, schools, departments and programs and helps the Higher Authorities of the education institution to make strategies for improvements.

OBJECTIVE OF THE PROJECT - SPMS 4.0:

SPMS 4.0 monitors and analyzes the performance of its stakeholders such as Students, Course instructors, Departments, Schools, Programs through the database of assessments such as quizzes, midterm exams, final term exams etc. In order to evaluate the performance of the stakeholders, SPMS 4.0 stores necessary documents and data in the database such as all the exam question papers, answer scripts, course outlines and marks of the exams and assessments with respect to their Course Outcomes (CO), Program Learning   Outcomes (PLO) and Program Outcomes (PO) achieved by the students. Hence, students can statistically monitor their own performance. SPMS 4.0 also creates opportunities for Higher Authorities to draw conclusions and make further improvements by providing them with a wide range of analytical reports based on the performance of students, course instructors, departments, schools, and programs.

SCOPE OF THE PROJECT:

We have done a complete analysis of the existing system (SPMS 2.0) and identified some issues in the business processes which can cause the process to become slow, inefficient and cause lapses in communication.

The proposed solution to overcome those issues is to create a more improved version of the system called SPMS 3.0 (Student Performance Monitoring System 3.0) which uses a Relational Database Management System (RDBMS) to store, update and retrieve necessary documents such as Course Outlines, Exam Question Papers and Answer Scripts as well as other necessary data required to monitor student performance and produce other OBE (outcome-Based Education) reports.

We have identified all the users of the system (SPMS 3.0), how they would be accessing the necessary data and information and how they would interact with each other etc.

We aim to develop interfaces that allow all users to access new data fields in the existing web application. These data fields will capture information such as Student ID, Educational year, Educational semester, Enrolled course, Enrolled section, and Obtained grade. Users will have the option to input data manually through a form or import data from a CSV file, which will be extracted and inputted into the database.

Additionally, we are implementing a new feature that calculates the course outcome percentage based on the obtained grades for each course. This calculated percentage will be displayed to both students and faculty members through the web application.

CHAPTER-2 REQUIREMENT ANALYSIS

Requirement Analysis is the process of determining what the database is used for. It involves interviews with stakeholders in order to identify the functionality and system requirements they expect and require from the database, what operations need to be performed and what data they need to process. By doing so, we can get a proper understanding of the stakeholders and how they interact with each other.

RICH PICTURE - EXISTING SYSTEM (SPMS 3.0):

A rich picture is a way to demonstrate processes in a system which is easier to understand for everyone. It consists of pictures, text, symbols and icons which are all used to illustrate graphically the situation. [3] A rich picture helps us to see relationships. and connections that we may otherwise miss [3]. It helps identifying one or more themes participants may want to further explore and address. Rich pictures are therefore always used in the pre-analysis phase [3].
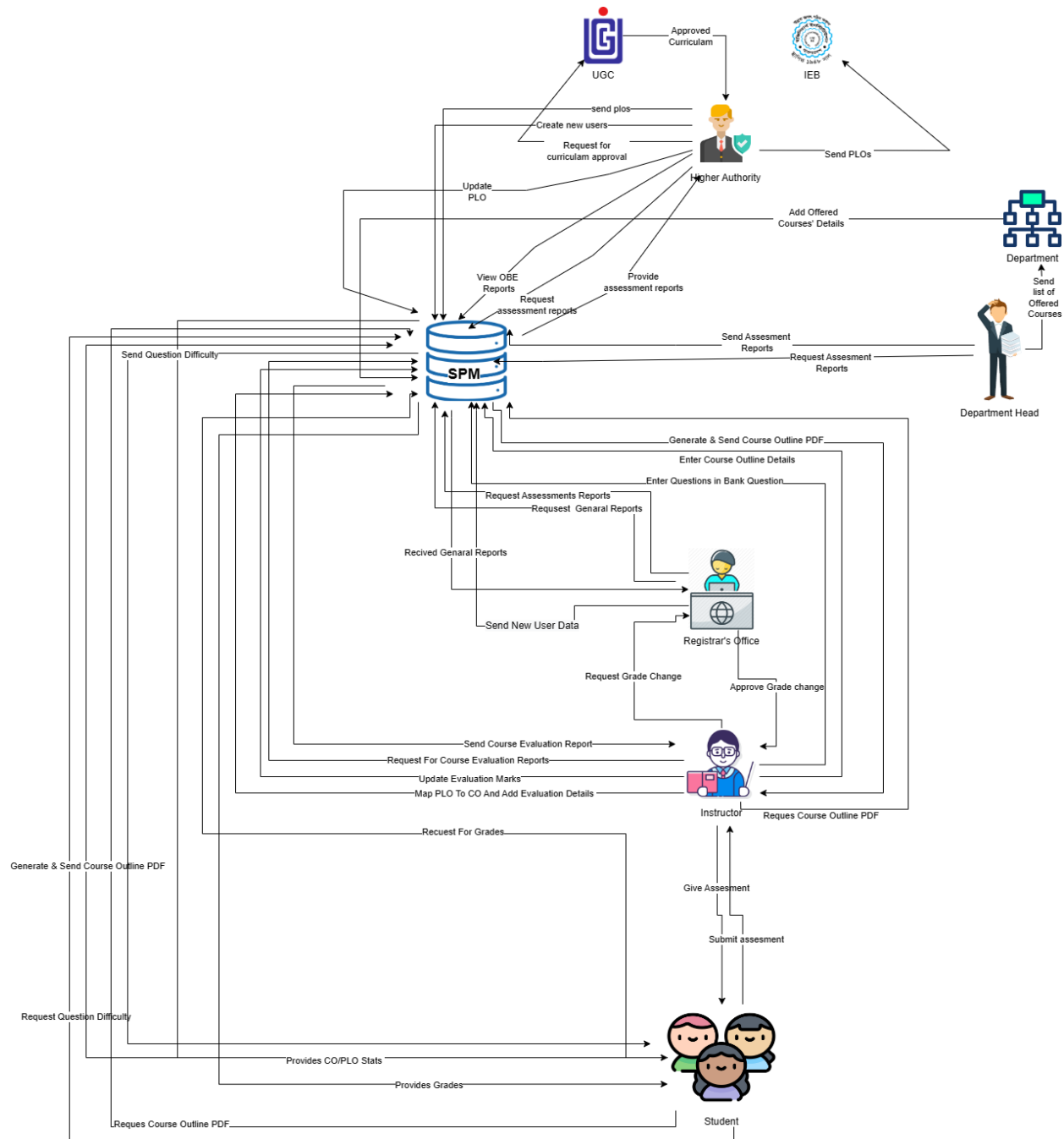
In this rich picture the stakeholders are:

1) IUB

2) IEB

3) Higher Authority (VC, Dean etc)

4) Department Head

5) Department Office

6) SPMSV 3.O Department Head (SPMS Manager)

7) Registers Office

8) Faculty

9) Student

The Main Storages are

1) SPMS V2.o

2) Physical Storage (Used by the faculty)

Existing Processes along with Six System Element Analysis

The six elements analysis of the proposed system is a continuation of an analysis process where each analysis is based on the one that comes before it. Based on the rich picture, the role of each element in the new system is further understood in the table below

Process	System Roles					
	Human	Non-Computing Hardware	Computing Hardware	Software	Database	Network and Communication

Student Enrollment	Student: a) Search for the website b) Goes to the website. c) Clicks on the form option. c) Fill up the form with required Information. Department Head : a) Department Head logs into	Paper and Stationery: a) Used to collect information about students through enrollment forms.	Computer/ Laptop a) SPMS Department Head will use Computers to access and update data. b) Users will use the computer to view the data. Database Server a) Used by SPMS Developers to collect data and	Operating Software a) Utilized by Registrar Office and SPMS Student a) Uses to fill up the form from the website. SPMS a) The software for which the Department Head istrator will set up user accounts.	Register Office Database a) Used by the registrar's office to compile student data into an excel file for sending to SPMS. SPMS a) For any upgrades or new user accounts, information is kept in the database. Excel a) Data from student	Internet a) To access and store data to SPMS it is used. b) It is used to collect the student form from the student to registrar office. c)The Registrar office sends all the student information to SPMS Department Head by using it.

	the system using SPMS User-ID and password. b) Receives the student enrollment information in the attached files. c) Department Head updates the student enrollment information in		maintain the software. Networking Devices (Router, Switch, Bridge, Hub): a) Used to access SPMS		accounts may be kept in an excel file and used later in SPMS.

	Database. d) Inputs the desired time period for number of students enrolled.					
Student Performance Based on CGPA	Student: a) Logs into the System using Student-ID and password. b) Inputs the desired time - period to view self CGPA		Computer/ Laptop a)User will need a computer to access SPMS Printer a)Used to print out the report if need be.	Operating Software a) The user uses it to execute SPMS 2.0 SPMS a) A performance trend will be generated by the software.	SPMS Database a) Obtain performance using the database.	Internet a) To login into and access the SPMS it is used.

	Progress. Department Head : a) Logs into the System using User-ID and password. b) Inputs the desired time period and School, Department or program to view Statistically and analyzed		Networking Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet.		

	CGPA trend of students. Faculty: a) Logs into the system using Faculty-ID and password. b) Inputs the desired time-period and program to view statistically and analyzed				

	CGPA trend of students or any individuals student those who attended the faculty's Section.					
Course-wise student performanc e based on CGPA	Student: a) Logs into the system using Student-ID and password. b) Inputs the course		Computer/ Laptop a)User will need a computer to access SPMS Printer	SPMS a) A performance trend based on GPA will be generated by the software.	SPMS Database a) Here, the performance will be stored and updated.	Internet a) To login into and access the SPMS it is used.

c) View self GPA for the course. **Departme nt Head :** a) Logs into the System using User-ID and password. b) Inputs the desired time-period Course-ID c) View statistically analyzed GPA trend of Students. Faculty:		a)Used to print out the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet.			

	a) Logs into the System using Faculty-ID and password. b) Inputs the desired time-period Course-ID under the faculty c)view statistically analyzed GPA trend of				

	students who faculty's section.					
Selective Number of Instructor-wise student performance based on the GPA	Department Head : a) Logs into the system using User-ID and password. b) Inputs the desired time-period Course-ID c)View statistically analyzed GPA trend of		Computer/ Laptop a)User will need a computer to access SPMS Printer a)Used to print out the report if need be. Networking Devices (Router, Switch,	SPMS a) a) The software will produce a performance trend for a specified instructor.	SPMS Database a) Here, the performance will be stored and updated.	Internet a) To login into and access the SPMS it is used.

	students for a selective number of Instructors. Faculty: a) Logs into the system using Faculty-ID and password. b) Inputs the desired time - period & Course-ID c)View statistically analyzed		Bridge, Hub): a)Used to access the Internet.		

	GPA trend of students for a selective number of Instructors. GPA trend of students for a selective number of Instructors.					
Department Head wise student performance	Department Head : a) Logs into the system using User-ID		Computer/ Laptop a)User will need a computer to access SPMS	SPMS a) The software will produce a performance trend	SPMS Database a) Here, the performance will be stored.	Internet a) To login into and access the SPM it is used.

	and password. b) Select Input from from VC/Dean/Department Head c) View the student performance trend as per choice.		Printer a)Used to print out the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet.			
Instructor-wise student performanc e based on	Department Head : a) Logs into the system		Computer/ Laptop a)User will need a computer to	SPMS a) The software will produce a	SPMS Database a) The performance	Internet a) To login into and access the

the GPA of the students	using Department-ID and Password. b) Inputs a particular instructor Name/ID c)View the student performance trend of selected Instructor. Faculty: a) Logs into the system		access SPMS Printer a)Used to print out the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet.	performance trend	will be stored and updated in the database.	SPM it is used.

	using User-ID and password. b) Input their Name/ID. c) View the student performance trend.					
Total PLO percentage achieved and attempted by the student along with the departmental average	Student: a) Logs into the system using Student-ID and Password b) Inputs the time-period		Computer/ Laptop a)User will need a computer to access SPMS Printer a)Used to print out the	Operating system a) Used by the SPMS SPMS a)A comparison of the attempted vs. achieved PLO as well as	SPMS Database a) Here, the performance will be stored.	Internet a) To login into and access the SPM it is used.

	c)Views their comparison of attempted vs achieved PLO percentage along with the departmental Average. Department Head : a) Logs into the system using User-ID and Password		report if need be. Networking Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet.	the departmental average will be produced by the software.		

	b) Inputs the time-period c) Views the comparison of students attempted PLO vs achieved PLO percentage along with the departmental average. Faculty: a) Logs into the system using User-ID and				

	Password. b) Inputs the time period. c) Views the comparison of students attempted PLO vs achieved PLO percentage along with the departmental Average.					
PLO achievement	Student: a) Logs into the system		Computer/ Laptop	SPMS a) A PLO achievement	SPMS Database	Internet a) To login into and

using Student-ID and password. b) Selects PLO achievement c) View PLO Achievement. Department Head : a) Logs into the System using user-ID and password. b) Selects		a)User will need a computer to access SPMS Printer a)Used to print out the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet.	will be generated by the software.	a) Here, the performance will be stored and updated.	access the SPMS it is used.

	PLO achievement c) View PLO Achievement. Faculty: a) Logs into the System using Faculty-ID and password. b) Selects PLO Achievement. c) View PLO				

	Achievement.					
Expected PLO-achievement versus actual score (for course's, student's, Department's, program's or school's)	Student: a) Logs into the system using Student-ID and password. b) Selects PLO achievement comparison c) View PLO achievement Comparison.		Computer/ Laptop a)User will need a computer to access SPMS Printer a)Used to print out the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a)Used to	SPMS a) A) The software will calculate the expected vs. achieved PLO.	SPMS Database a) The performance will be stored and updated in the database.	Internet a) To login into and access the SPMS it is used.

	Department Head : a) Logs into the system using user-ID and password. b) Selects PLO achievement comparison c) View PLO achievement Comparison. Faculty: a) Logs into the System		access the Internet.			

	using Faculty-ID and password. b) Selects PLO achievement comparison. c) view PLO Achievement comparison.					
CO-PLO achievement summary	Student: a) Logs into the system using Student-ID and		Computer/ Laptop a)User will need a computer to	SPMS a)The software will produce a summary of CO-PLO	SPMS Database a) The Summary will be stored	Internet a) To login into and access the SPMS it is used.

password. b) Selects CO -PLO achievement summary. c) View CO- PLO achievement summary. Department Head : a) Logs into the system using user-ID and password. b) Selects CO -PLO		access SPMS Printer a)Used to print out the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet.	accomplishments.	and updated in the database.	

	achievement summary.					
	c) View CO - PLO achievement Summary.					
	Faculty: a) Logs into the system using Faculty-ID and password.					
	b) Selects CO -PLO achievement summary.					

	c) View CO - PLO achievement Summary.					
Question Bank	Student: a) Logs into the system using Student-ID and password. b) Selects Question Bank c) Views form d)Selects course, section and semester and		Computer/ Laptop a)User will need a computer to access SPMS Printer a)Used to print out the report if need be. Networking Devices (Router,	SPMS a)The software will produce Question Bank	SPMS Database a) The Question Bank will be stored and updated in the database	Internet a) To login into and access the SPMS it is used.

	assessment type. d)Downloads questions Faculty: a) Logs into the System using Faculty-ID and password. b) Selects question bank c) Views form d)Selects course, section and semester and		Switch, Bridge, Hub): a)Used to access the Internet		

	assessment type. e) Uploads questions					
Course Outline	Student: a) Logs into the system using Student-ID and password. b) Selects Couse Outline c) Views form d)Selects course, section and semester.		Computer/ Laptop a)User will need a computer to access SPMS Printer a)Used to print out the report if need be. Networking Devices (Router, Switch, | SPMS a)The software will generate course Outline	SPMS Database a) The Couse Outline will be stored and updated in the database	Internet a) To login into and access the SPMS it is used.

	d)Downloads course outline. Faculty: a) Logs into the System using Faculty-ID and password. b) Selects Course Outline c) Views form d)Selects course, section and semester. e)Uploads course outline		Bridge, Hub): a)Used to access the Internet		

EXISTING PROBLEMS & ANALYSIS OF THE PROBLEM

PROCESS NAME	EXISTING SYSTEM PROBLEMS	PROPOSED SOLUTION
DEVELOPING A CUSTOMIZED DASHBOARD SYSTEM	All users share the same dashboard. There is no feature allocation or role changes in each dashboard. Each user is not supposed to have every available feature.	Providing access to features and functionalities based on user roles. Developing a dynamic dashboard that only displays features and functionalities based on user roles.
IMPLEMENTING WEB APPLICATION SECURITY CONTROLS	All users can access every feature. Whether the webpage is linked or not, each user can access every page just by hitting URL.	Implementing authentication using PHP sessions, cookies, or other methods.
IMPLEMENTING A BACKLOG RECORD MANAGEMENT SYSTEM.	Backlogged records were unable to store.	Creating a new form to collect backlogged records of student's grade or CLO, PLO data records

PROPOSED BUSINESS SYSTEM (WITH RICH PICTURE)

The enhanced system will enable users to access additional data fields within the existing web application, capturing details such as Student ID, Educational year, Educational semester, Enrolled course, Enrolled section, and Obtained grade. Users will have the flexibility to input data manually through a form or import data from a CSV file, which will be extracted and integrated into the database.
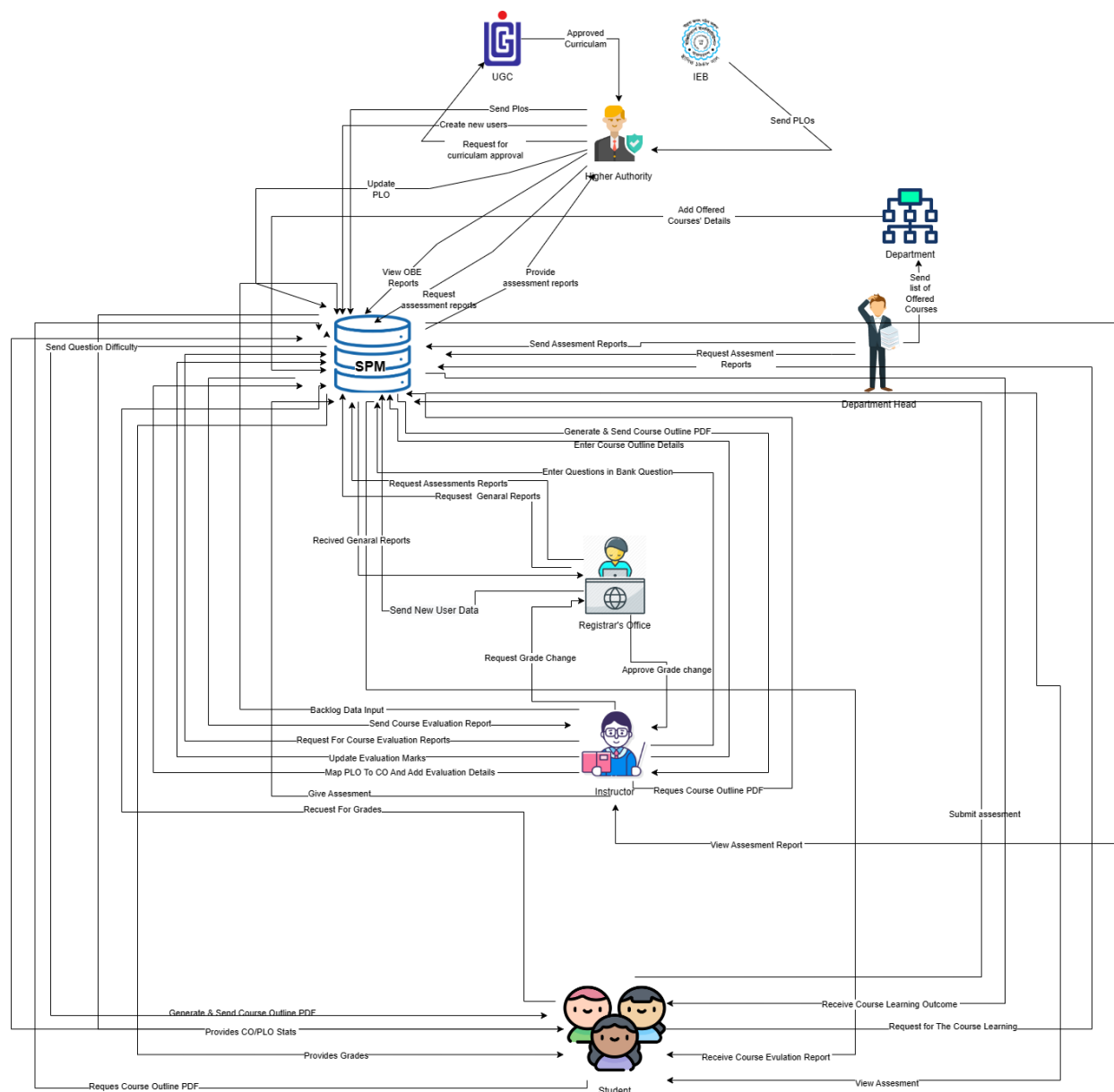
PROPOSED PROCESSES ALONG WITH SIX SYSTEM ELEMENT ANALYSIS

The six elements analysis of the proposed system is a continuation of an analysis process where each analysis is based on the one that comes before it. Based on the rich picture, the role of each element in the new system is further understood in the table below.

Process	System Roles					
	Human	Non-Computing Hardware	Computing Hardware	Software	Database	Network and Communication
Student Enrollment	Student: Search for the website Goes to the website. Clicks on the form	Paper and Stationery: a) Used to collect information about students through enrollment forms.	Computer/ Laptop a) SPMS Department Head will use Computers to acce ss and update data.	Operating Software a) Utilized by Registrar Office and SPMS Student a) Uses to fill	Register Office Database a) Used by the registrar's office to compile student data into an excel file for	Internet To access and store data to SPMS it is used. It is used to collect the student form from

option. c) Fill up the form with required Information. Department Head : Department Head logs into the system using SPMS User-ID and password. Receives the student enrollment information in the attached files. Department Head updates the student enrollment information in Database. d) Inputs the desired time period for number of students enrolled.		b) Users will use the computer to view the data. Database Server a) Used by SPMS Developers to collect data and maintain the software. Networking Devices (Router, Switch, Bridge, Hub): a) Used to access SP MS	up the form from the website. SPMS a) The software for which the administrator will set up user accounts.	sending to SPMS. SPMS a) For any upgrades or new user accounts, information is kept in the database. Excel a) Data from student accounts may be kept in an excel file and used later in SPMS.	the student to registrar office. c)The Registrar office sends all the student information to SPMS Department Head by using it.

Student Performance Based on CGPA	Student: Logs into the System using StudentID and password. Inputs the desired		Computer/ Laptop a)User will need a computer to acce ss SPMS Printer a)Used to print out	Operating Software a) The user uses it to execute SPMS 2.0 SPMS a) A performance trend will be	SPMS Database a) Obtain performance using the database.	Internet a) To login into and access the SPMS it is used.

time period to view self CGPA Progress. Department Head: a) Logs into the System using User-ID and password. b) Inputs the desired time period and School, Department or program to view Statistically and analyzed		the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet.	generated by the software.		

CGPA trend of students. Faculty: a) Logs into the system using Faculty ID and password. b) Inputs the desired time -period and program to view statistically and analyzed CGPA trend					

	of students or any individuals studet those who attended the faculty's Section.					

Coursewise student performance based on CGPA	Student: a) Logs into the system using StudentID and password. b) Inputs the course c)View self GPA for The		Computer/ Laptop a)User will need a computer to access SPMS Printer a)Used to print out the report if need be. Networking Devices (Router,	SPMS a) A performance trend based on GPA will be generated by the software.	SPMS Database a) Here, the performance will be stored and updated.	Internet a) To login into and access the SPMS it is used.

	password. b) Inputs the desired time - period Course-ID under the faculty c)view statistically analyzed GPA trend of students who faculty's section.					
	b) Inputs the desired time					

Selective Number of Instructor wise student performance based on the GPA	Department Head : a) Logs into the system using User-ID and password.		Computer/ Laptop a)User will need a computer to access SPMS	SPMS a) a) The software will produce a performance trend for a specified instructor.	SPMS Database a) Here, the performance will be stored and updated.	Internet a) To login into and access the SPMS it is used.

	b) Inputs the desired time- period Course-ID c)View statistically analyzed GPA trend of students for a selective number of Instructors. Faculty: a) Logs into the system using FacultyID and password.		Printer a)Used to print out the report if need be. Networkin g Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet.		

	b) Inputs the desired time - period & Course -ID c)View statistically analyzed GPA trend of students for a selective number of Instructors. GPA trend of students for a selective number of Instructors.				

| Department Head wise student performance | Department Head :

 a) Logs into the system using User-ID and password.

 b) Select Input from from VC/Dean/ Departme nt Head

 c) View the student performance trend as per choice.

 Department Head : | Computer/ Laptop

 a)User will need a computer to acce ss SPMS

 Printer

 a)Used to print out the report if need be.

 Networkin g Devices (Router,

 Switch,

 Bridge,

 Hub):

 a)Used to access the

 Internet. | SPMS   The

 a) software will produce a performance trend | SPMS

 Database

 The performance will be stored and updated in the database

 SPMS

 Database | Internet

 a) To login into and access the SPM it is used.

 Internet |

Instructor Wise student performance based on the GPA of the students	a) Logs into the system using Department-ID and Password. b) Inputs a particular instructor Name/ID c)View the student performance trend of selected Instructor Faculty: a) Logs into the system using User-ID And password. b) Input their Name/ID. c) View the student performance trend.	a)User will need a computer to access SPMS Printer a)Used to print out the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet.	SPMS a) The software will produce a performance trend	The performance will be stored and updated in the database	a) To login into and access the SPM it is used.

Total PLO percentage achieved and attempted by the student along with the departmental average	Student: a) Logs into the system using Student-ID and Password b) Inputs the time-period c)Views their comparison of attempted		Computer/ Laptop a)User will need a computer to access SPMS Printer a)Used to print out the report if need be. Networkin g Devices (Router,	Operating system a) Used by the SPMS SPMS a)A comparison of the attempted vs. achieved PLO as well as the departmental average will be produced by the software.	SPMS Database a) Here, the performance will be stored.	Internet a) To login into and access the SPM it is used.

	vs achieved PLO percentage along with the departmental Average. Department Head : a) Logs into the system using User-ID and Password b) Inputs the time-period c)Views the comparison of d)students attempted PLO vs achieved PLO percentage along with the departmenal average. Registrar'		Switch, Bridge, Hub): a)Used to access the Internet.			

| | s office: a) Logs into the system using User-ID and Password b) Inputs the timeperiod c) Views the comparison of students Attempted PLO vs achieved PLO percentag e along with the departmen tal average.

Faculty: a) Logs into the system using User-ID and Password. b) Inputs the time period. c) Views the compariso n of students attempted PLO vs achieved PLO percentag e | | | | | |
|---|---|---|---|---|---|---|

	along with the departmen tal Average. Dean a) Logs into the system using User ID and Password b) Inputs the time period c) Views the compariso n of students Attempted PLO vs achieved PLO percentag e along with the departmen tal average. VC a) Logs into the system using User-ID and Password. b) Inputs the time period. c) Views the comparison of students attempted PLO vs achieved PLO percentage				

	along with the departmental average.					

PLO achievement	Student: a) Logs into the system using StudentID and password. b) Selects PLO achievement c) View PLO Achievement. c) View PLO Achievement. Department Head: a) Logs into the System using user-ID and password. b) Selects PLO achievement c) View PLO Achievement.		Computer/ Laptop a)User will need a computer to access SPMS Printer a)Used to print out the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a) Used to access the Internet.	SPMS a) A PLO achievement will be generated by the software.	SPMS Database a) Here, the performance will be stored and updated.	Internet a) To login into and access the SPMS it is used.

	a) Logs into the system using user-ID and password. b) Selects PLO achievement. c) View PLO Achievement. Faculty: a) Logs into the System using Faculty-ID and password. b) Selects PLO Achievement. c) View PLO Achievement. Dean a) Logs into the System using user-ID and password. b) Selects PLO achievement. c) View PLO Achievement. VC a) Logs into the system using user-ID and password.				

	b) Selects PLO achievement. c) View PLO Achievement				

Expected PLO achievement versus actual score (for course's, student's, Department's, program's or school's)	Student: a) Logs into the system using StudentID and password. b) Selects PLO achievement comparison c) View PLO achievement Comparison.		Computer/ Laptop a)User will need a computer to acce ss SPMS Printer a)Used to print out the report if need be. Networkin g Devices (Router, Switch, Bridge, Hub): a)Used to	SPMS a) A) The software will calculate the expected vs. achieved PLO.	SPMS Database a) The performance will be stored and updated in the database.	Internet a) To login into and access the SPMS it is used.

	Department Head : a)Logs into the system using user-ID and password. a) Selects PLO achievement comparison b) View PLO achievement Comparison. Faculty: a) Logs into the System using		access the Internet.		

FacultyID and password. b) Selects PLO achievement comparison. c) view PLO Achievement comparison.					

CO-PLO achievement summary	Student: a) Logs into the system using StudentID and password. b) Selects CO -PLO		Computer/ Laptop a)User will need a computer to acc ess SPMS Printer a)Used to print out the report if need be.	SPMS a)The software will produce a summary of CO-PLO accomplishments.	SPMS Database a) The Summary will be stored and updated in the database.	Internet a) To login into and access the SPMS it is used.

achivement summary. c) View CO-PLO achievement summary. Department Head : a) Logs into the system using user-ID and password. b) Selects CO -PLO achievement summary. c) View CO - PLO achievement Summary.		Networkin g Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet.	

	Faculty: a) Logs into the system using FacultyID and password. b) Selects CO -PLO achieveme nt summary. c) View CO - PLO achievement Summary.					

Question Bank	Student: a) Logs into the system using		Computer/ Laptop a)User will need a computer	SPMS a)The software will produce Question Bank	SPMS Database a) The Question Bank	Internet a) To login into and access the SPMS it is used.

	StudentID and password. b) Selects Question Bank c) Views form d)Selects course, section and semester and assessment type. d)Downloads questions Faculty: a) Logs into the System using Faculty-ID and		to acce ss SPMS Printer a)Used to print out the report if need be. Networkin g Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet		will be stored and updated in the database

password. b) Selects question bank c) Views form d)Selects course, section and semester and assessment type. e) Uploads questions					

Backlog Records	Student: Logs into the system using StudentID and password. Selects Couse Outline		Computer/ Laptop a)User will need a computer to acc ess SPMS Printer a)Used to print out	SPMS a)The software will generate course Outline	SPMS Database a) The Couse Outline will be stored and updated in the database	Internet a) To login into and access the SPMS it is used.

	c) Views form d)Selects course, section and semester. d)Downloads course outline. Faculty: a) Logs into the System using FacultyID and password. b) Selects Course Outline c) Views form d)Selects course, section and semester e)Upload Course Line		the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet			

CH-3 LOGICAL SYSTEM DESIGN

BUSINESS RULES

1. A **STUDENT** will have a department. A Student has **StudentID**, Name consisting of first name and last name, DateOfBirth, Email. A **student** will have one department, but a **department** will have many students.

2. A **DEPARTMENT** includes **DepartmentID**, DepartmentName. A Department will come under a School. But a **SCHOOL** will have many departments. School has **SchoolID**, SchoolName. A **School** will have many departments, but a **department** will have one school. A **Department** will offer many **programs,** but a **program** must be offered by one **department**.

3. Under a **department** there will be many offered programs, but a particular program will be offered only by one department. **PROGRAM** includes **ProgramID** and ProgramName.

4. A program must offer many Courses.But a **COURSE** will be offered by one program. Course consists of **CourseID**, CourseName and Credit.

5. A Course may maintain multiple questions**.** But a Question will be maintained for one Course. **QUESTION** has **QuestionID,** QuestionDescription, DifficultyLevel, Bloom'sTaxonomyDomain.

6. A Department must have multiple Faculties. A **FACULTY** will work in one department. The Faculty has **FacultyID**, Name consisting of first name and last name, DateOfJoining, Email. Also, a faculty may manage a department but a department will be managed by one faculty.

7. A Faculty will teach many sections**. SECTION** includes **SectionID**, SectionNo, Semester. A section will be taught by one Faculty.
In a Section there will be many enrollments.But one enrollment has one section. **ENROLLMENT** has **EnrollmentID**, Semester and Year.

8. Every Program must maintain many **PLO.** But a PLO will be maintained for one Program. PLO has **PloID**, PloDescription, PloNumber. Each PLO will be associated with many **CO**. But a CO will be associated with only one PLO. CO includes **CoID**, CoDescription, CoNumber.

9. A faculty may prepare many course outlines. But a course outline will be prepared by one faculty. **Course Outline** will have **CourseOutlineID** , CourseOutlineDescription, CoursePolicy, LessonPlan also has MarkDistribution which is made up with ExamType and Percentage also markDistribution will consist of multiple values.

10. A **student** will complete many **enrolments.** But an Enrolment will be completed by one student. A **school** will have **faculty,** but a **faculty** may work under a **school**. A **faculty** may prepare **course outlines** but a **course outline** has to be prepared by a **faculty**. A **faculty** will teach in many **sections**, but a **section** will be taught by one **faculty**. A **faculty** may update **questions,** but a **question** has to be updated by a **faculty**.

11. A **course** will be completed by **CO,** but a **CO** must be completed by a **course**. A **CO** must be associated with a **PLO,** but a **PLO** will be associated with many **CO**. A **CO** will be associated with many questions, but a question has to be associated with one **CO**. A **PLO** must be maintained by a **program**, but a **program** will maintain many **PLO**.

12. A **program** will offer many **courses,** but a **course** has to be offered by one **program** A **course** may maintain many **questions,** but a **question** will be maintained by one **course**. A **course** is offered by one **program,** but a **program** will offer many **courses**. A **course** will have many **sections,** but a **section** will have one **course**.

13. An **enrolment** will have one **section,** but a **section** will have many **enrolments**. An enrolment may have many evaluations, but an evaluation will have one enrolment. An **evaluation** has one **question,** but a **question** may be done for many **evaluations**.

14. A **section** has to be assigned to a **course outline,** but a **course outline** will also have one **section**. A **Student** can request for the course outcome percentage to SPMS2.0 server and receive it. A **Student** can request for the course outcome percentage to SPMS2.0 server and receive it.

A. ENTITY RELATIONSHIP DIAGRAM:
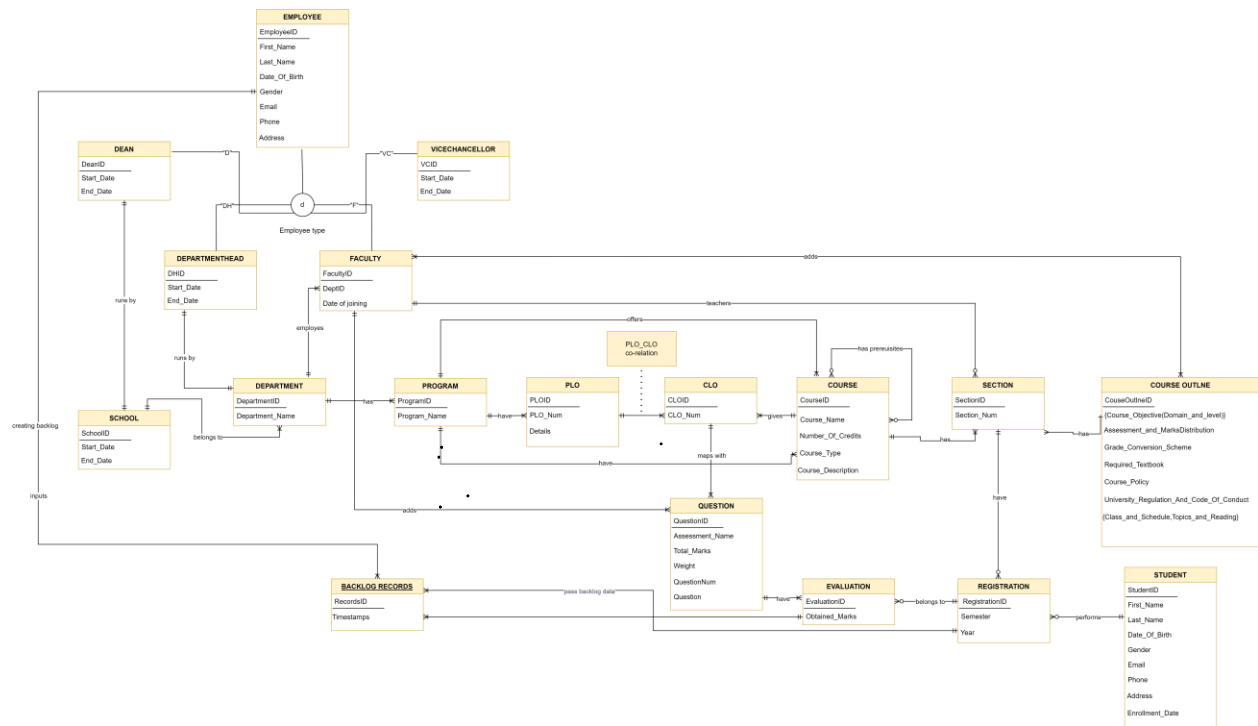
ENTITY RELATIONSHIP DIAGRAM TO RELATIONAL SCHEMA:

EMPLOYEE

EmployeeID	First_Name	Last_Name	Date_Of_Birth	Gender	Email	Phone	Address

DEAN

DeanID	.SchoolID.	Start_Date	End_Date

Vice Chancellor

VCID	Start_Date	End_Date

PREREUISITE

.CourseID.	PreReuisiteID

SCHOOL

SchoolID	Start_Date	End_Date

DEPARTMENT

DepartmentID	Department_Name	..SchoolID..

COURSE

CourseID	Course_Name	Number_Of_Credits	Course_Type	.ProgramID.	Course_description

PROGRAM

ProgramID	Program_Name	DepartmentID

CLO

CLOID	Clo_Num	CourseID	PLOID

SECTION

SectionID	Section_Num	.CourseID.	FacultyID	CourseoutlineID

DEPARTMENTHEAD

DHID	Department_ID	Start_Date	EndDate

PLO

PLOID	PLO_Num	Details	ProgramID

REGISTRATION

RegistrationID	Semester	Year	.StudentID.	.SectionID.

FACULTY

FacultyID	DepartmentID	Date of joining

QUESTION

QuestionID	Assessment_Name	Total_Marks	Weight	QuestionNum	Question	.CLOID.	.FacultyID.

EVALUATION

EvaluationID	Obtained_Marks	QuestionID	RegistrationID

STUDENT

StudentID	First_Name	Last_Name	Date_Of_Birth	Gender	Email	Phone	Address	Enrollment_Date

ADDING_COURSE

CourseOutlineID	FacultyID

COURSE_OUTLINE

CourseOutlineID	Assessment_and_MarkDistribution	Grade_Conversion_Scheme	Required_Textbook	Course_Policy	University_Regulation_And_Code_Of_Conduct

COURSE_OBJECTIVE

CourseOutlineID	Domain_and_level

COURSE_SCHEDULE

CourseOutlineID	Class_and_Schdule	Topics_and_Reading

Backlog_RECORDS

RecordID	Timestamps	EvaluationID	RegistrationID	EmployeeID

NORMALIZATION:

1NF:

T1

a1	a2	a3	a4	a5	a6	a7	a8	<u>b1</u>	b2	b3	<u>c1</u>
c2	c3	g1	<u>d1</u>	d2	d3	h1	e1	e2	f1	f2	f3
f4	f5	f6	f7	f8	f9	l1	l2	l3	l4	l5	i1
m1	m2	m3	r1	j1	j2	j3	k1	k2	q1	q2	q3
<u>n1</u>	n2	p1	o1	o2	o3	o4	o5	o6	r2	r3	r4
r5	r6	p2	h2	g2	g3						

2NF:

T13

<u>c1</u>	c2	c3	g1

T12

<u>d1</u>	d2	d3	h1

T11

<u>n1</u>	n2	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2
b3	g1	p1	r2	r3	r4	h1	e1	e2	<u>f1</u>	f2	f3
f4	f5	f6	f7	f8	f9	l1	l2	l3	l4	l5	i1
m1	m2	m3	r1	j1	j2	j3	k1	k2	q1	q2	q3
r5	r6	p2	h2	g2	g3						

T14

<u>b1</u>	b2	b3

3NF:

T110

<u>c1</u>	c2	c3	g1

T115

g1	g2	g3

T116

o1	o2	o3	o4	o5	o6	e1	k1

T119

j1	j2	j3	i1

T114

p1	p2	o1	q1

T118

k1	k2	l1	j1

T120

i1	i2	h1

T111

<u>n1</u>	n2	a1	q1	p1

T117

e1	e2	h1

T121

l1	l2	l3	l4	l5	i1

T113

q1	q2	q3	f1	m1

T112

a1	a2	a3	a4	a5	a6	a7	a8

T122

h1	h2	g1

T123

<u>d1</u>	d2	d3	h1

T125

<u>m1</u>	m2	m3	e1	l1	r1

T124

<u>r1</u>	r2	r3	r4	r5	r6

T126

f1	f2	f3	f4	f5	f6	f7	f8	f9

T14

<u>b1</u>	b2	b3
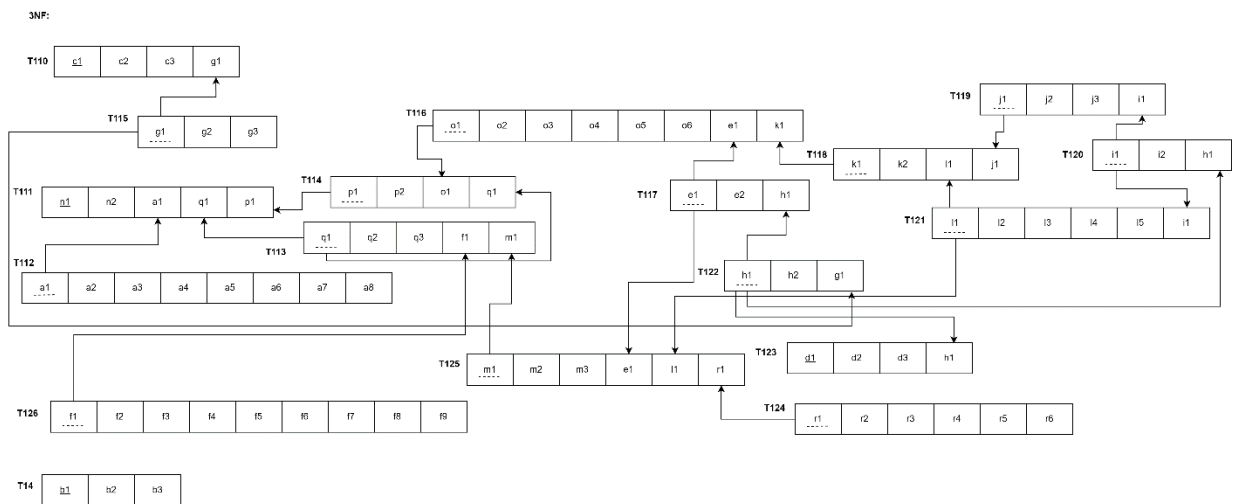
T14 was already in 3NF

BCNF:

All relations are already in BCNF.

DATA DICTIONARY:

School_T

Name	Data Type	Size	Remarks
cSchoolID	VARCHAR	5	This is the primary key of School. E.g.: "SETS"
cSchoolName	VARCHAR	50	This is the name of the school. E.g.: "School of Engineering, Technology & Science".

Program_T

Name	Data Type	Size	Remarks
cProgramID	INTEGER		This is the primary key for a program. E.g.: "1"
cProgramName	VARCHAR	50	This is the name of the program. E.g.: "Bachelor of Science"
cDepartmentID	VARCHAR	3	This is the foreign key from the Department table. E.g.: "CSE"

Department_T

Name	Data Type	Size	Remarks
cDepartmentID	VARCHAR	3	This is the primary key for the Department table. E.g.: "CSE"
cDepartmentName	VARCHAR	50	This is the name of the department. E.g.: "Computer Science and Engineering".
cSchoolID	VARCHAR	5	This is a foreign key from the school table. E.g.: "SETS".

CLO_T

Name	Data Type	Size	Remarks
nCLOID	INTEGER		This is the primary key for the CLO table. E.g.: "1".
cCLONum	TEXT		E.g.: "CLO1".
nThreshold	Integer		It is the minimum marks needed to pass E.g., "40"

cPLOID	INT		This is the foreign key from the Program Learning Outcome table. E.g.: "PLO1"
cCourseID	VARCHAR	6	This is the Foreign Key from the Course table. E.g.: "CSE203"

PLO_T

Name	Datatype	Size	Remarks
cPLOID	VARCHAR	5	This is the primary key for Program Learning Outcome. E.g.: "PLO1"
nPLONum	INTEGER		This is the PLO number. E.g.: "1"
cDetails	VARCHAR	50	This is the details for Program Learning Outcome. E.g.: "An ability to select and apply the knowledge, technique, skills and modern tools of the computer science and engineering discipline"
cProgramID	INTEGER		This is the foreign key from the program table. E.g.: "1"

Evaluation_T

Name	Datatype	Size	Remarks
nEvaluationID	INTEGER		This is the Primary Key for Enrollment.
cObtainedMarks	NUMBER		This is the obtained marks of the student. E.g.: "24.5"

| cQuestionID | INTEGER | | This is the foreign key from the assessment table. |
| nRegistrationID | INTEGER | | This is the Foreign Key from Registration table. |

Student_T

Name	Data Type	Size	Remarks
nStudentID	INTEGER		This is the primary key for the student table. E.g.: "1921834".
cFirstName	VARCHAR	30	This is the first name of the student. E.g.: "Rakibul".
cLastName	VARCHAR	30	This is the last name of the student. E.g.: "Hasan".
dDateOfBirth	DATE	DD MM YYYY	This is the birth date of the student. E.g.: "21-12-1996".
cGender	VARCHAR	6	This is the gender of the student. E.g.: "Female".
cEmail	VARCHAR	30	This is the email of the student. E.g.: "1921834@iub.edu.bd"
nPhone	NUMERIC	11	This is the phone of the student. E.g.: "01XXXXXXXXX".

cAddress	VARCHAR	50	This is the address of the student. E.g.: "House 1, Road 4, Block D, Bashundhara RA".
dEnrollmentDate	DATE	DD MM YYYY	This is enrollment date of the student. E.g.: "1-1-2019"
cProgramID	INTEGER		This is the foreign key from the program table. E.g.: "1"
cDepartmentID	VARCHAR	3	This is the foreign key from the Department table. E.g.: "CSE"

Employee_T

Name	Datatype	Size	Remarks
nEmployeeID	INTEGER		This is the primary key for Employee table. E.g.: "1801"
cFirstName	VARCHAR	30	This is the first name of the faculty. E.g.: "Sadita"
cLastName	VARCHAR	30	This is the last name of the faculty. E.g.: "Ahmed"
dDateofbirth	DATE	DD-MM YYYY	This is the date of Birth of the faculty. E.g:01-01-1992

cGender	VARCHAR	6	This is the gender of the faculty. E.g.: "Female"
cEmail	VARCHAR	30	This is the email address of the student. E.g.: "1675231@iub.edu.bd"
nPhone	NUMERIC	11	This is the phone number of the faculty. E.g.: "01292383111"
cAddress	VARCHAR	30	This is the address of the faculty. E.g.: "House 14, Road 21, Sector 11, Baridara,Dhaka, Bangladesh"
cEmployeeType	CHAR	1	This is the type of the employee. E.g.: "F"

Course_T

Name	Datatype	Size	Remarks
cCourseID	VARCHAR	6	This is the Primary Key for the Course. E.g.: "CSE203"
cCourseName	VARCHAR	40	This is the name of the Course. E.g.: "Discreet Mathematics"
nNumOfCredits	INTEGER		This is the number of credits for the Course. E.g.: "3"
cCourseType	VARCHAR	10	This is the type of the Course. E.g.: "Core"

cPLOID	INTEGER		This is the foreign key from the Program Learning Outcome table. E.g.: "PLO1"

Section_T

Name	Datatype	Size	Remarks
nSectionID	INTEGER		This is the Primary Key for Section. E.g.: "1"
nSectionNum	INTEGER		This is the section number. E.g.: "1"
cCourseID	VARCHAR	6	This is the foreign key from the Course table. E.g.: "CSE101"
cSemester	VARCHAR	6	This is the semester of the section. E.g.: "Summer"
cFacultyID	NUMERIC	4	This is the foreign key from Faculty table. E.g.: "1801"
dYear	YEAR	yyyy	This is the year of registration. E.g.: "2019"

Registration_T

Name	Datatype	Size	Remarks
nRegistrationID	INTEGER		This is the Primary Key for Registration. E.g.: "0101010101"
cSemester	VARCHAR	6	This is the semester of registration. E.g.: "Spring"
dYear	YEAR	yyyy	This is the year of registration. E.g.: "2019"

Question_T

Name	Datatype	Size	Remarks
nQuestionID	INTEGER		This is the Primary Key for Assessment.
cAssessmentName	VARCHAR	30	This is the name of the assessment. E.g.: "Mid"
cTotalMarks	NUMBER		This is the total marks of the assessment. E.g.: "30"
cQuestion	VARCHAR		This is the question for the assessment. E.g.: "What is SQL"
nQuestionNum	INTEGER		This is the question number E.g.: "1,2,3…."

Name	Datatype	Size	Remarks
nWeight	INTEGER		This is the percentage range for assessment. E.g.: "Project- 50%, Assessment-50%".
nSectionID	INTEGER		This is the Foreign Key from Section table.
nCOID	INTEGER		This is the Foreign Key from the Course Outcome table.

Faculty_T

Name	Datatype	Size	Remarks
nFacultyID	INTEGER		This is the primary key for the faculty table. E.g.: "4250"
dJoinDate	DATE	dd-mm yyyy	This is starting date. E.g.: "01-03-2020"
cRank	VARCHAR	30	This is the rank of the faculty. E.g.: "Assistant Professor"
cDepartmentID	VARCHAR	3	This is the foreign key from the Department table. E.g.: "CSE"

Admin_T

Name	Datatype	Size	Remarks

nAdminID	INTEGER		This is the primary key for the admin table. E.g.: "4250"
cAdminType	VARCHAR	30	This is the type of user logging in E.g.: "VC"
dJoinDate	DATE	dd-mm yyyy	This is starting date. E.g.: "01-03-2020"
cRank	VARCHAR	30	This is the rank of the admin. E.g.: "Assistant Professor"
dEndDate	DATE	dd-mm yyyy	This is the date the admin retires from his post. E.g.: "01-03-2024"
cDepartmentID	VARCHAR	3	This is the foreign key from the Department table. E.g.: "CSE"
cSchoolID	VARCHAR	5	This is a foreign key from the school table. E.g.: "SETS".

Course_Outline_T

Name	Datatype	Size	Remarks
nCourseOutlineID	INTEGER		This is the Primary Key for Course Outline.

| cCourseDescription	TEXT		This is the description of the course E.g.: "Basic concepts of DBMS."
cAssessmentAndMarksDistribution	TEXT		This is the total marks distribution of the course. E.g.: "Final-100"
cGradeConversionScheme	TEXT		This is the breakdown of which grade carries which score E.g.: "A-4.00"
cRequiedTextbook	TEXT		This is the list of the books required for the course E.g.: "Modern Database Management by Jeffrey A. Hoffer, Mary B. Prescott, Fred R. Mcfadden."
cCourcePolicy	TEXT		These are the policies of a course E.g.: "No working mobile phones are allowed in class."
cUniversityRegulationAndCodeOfConduct	TEXT		These are the rules given by the university that must be maintained. E.g.," Please see the Green Book for further information"
nSectionID	INTEGER		This is the Foreign Key from Section table.

Backlog_Records_T

Name	Datatype	Size	Remarks
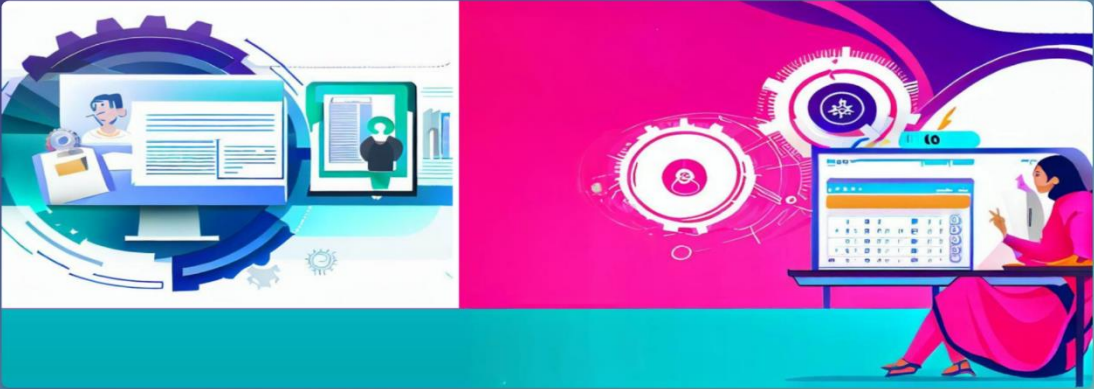
Timestamps	DATETIME	yyyy-mm-dd	Here 'Timestamps' is generating DATETIME datatype, where it is containing the data of entry log of backlog data.

CHAPTER-4 PHYSICAL SYSTEM DESIGN

STARTUP PAGE:

INPUT FORMS:

EXAM NAME	COURSE	SECTION
NO. OF QUESTIONS	SEMESTER	YEAR

Question Number	Question Details	Mark	CO Number

```php
$examName=$_POST['examName'];
$sectionNum=$_POST['sectionNum'];
$questionCount=$_POST['questionCount'];
$courseID=$_POST['courseID'];
$semester=$_POST['semester'];
$year=$_POST['year'];

//Getting section ID from database
$result=mysqli_query($con,"SELECT sec.sectionID AS sectionID
FROM section_t AS sec
WHERE sec.sectionNum='$sectionNum' AND sec.courseID='$courseID'
AND sec.semester='$semester' AND sec.year='$year'");
$row=mysqli_fetch_assoc($result);
$sectionID=$row['sectionID'];

//storing exam in database
$query="INSERT INTO `exam_t` (`examID`, `examName`, `sectionID`)
VALUES (NULL, '$examName', '$sectionID')";
$result=mysqli_query($con,$query);

//getting the exam ID from database
$result=mysqli_query($con,"SELECT MAX(examID) AS examID
```

CHAPTER-5 CONCLUSION

PROBLEM AND SOLUTION:

Analysis Phase:

During the Analysis Phase, a significant challenge encountered was the lack of data on the organizational operations, which led to confusion regarding the Rich Picture and Six Element Analysis. In order to address this issue, interviews were conducted with Faculty members and other stakeholders to clarify the operations and gather relevant information. The data collected from these interviews was then utilized to gain a more comprehensive understanding of the system being developed.

Design Phase:

Challenges arose during the Design Phase when creating the EERD and Relational Schema, but they were successfully resolved with the help of continuous feedback from faculty members. Their input proved valuable in overcoming the issues encountered during the design process.

Implementation Phase:

All the System Requirements were completed successfully.

Front-End Developing tools: HTML, CSS, JavaScript, Google Bar Charts, Chart JS

Back-End Developing tools: PHP, JSON

Database-integration: MySQL

Additional Features and Future Development:

One new feature could be added to this system in the near future which can monitor a student's extracurricular activities and then provide reports and analytics based on the student's extracurricular activity performance.

Conclusion & Recommendations

We believe that our idea for an SPM software has been developed and implemented in the best possible way. Our goal is to enhance the quality of education offered by institutions through the effective utilization of this software. This program can benefit students who strive to become proficient scholars, faculties who wish to keep track of their students' progress and adapt their teaching techniques accordingly, as well as institutional members who aim to manage their resources more efficiently.