



DATABASE MANAGEMENT PROJECT

STUDENTS PERFORMANCE MONITORING SYSTEM 4.0

TEAM: FAILURE DATABEES

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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.

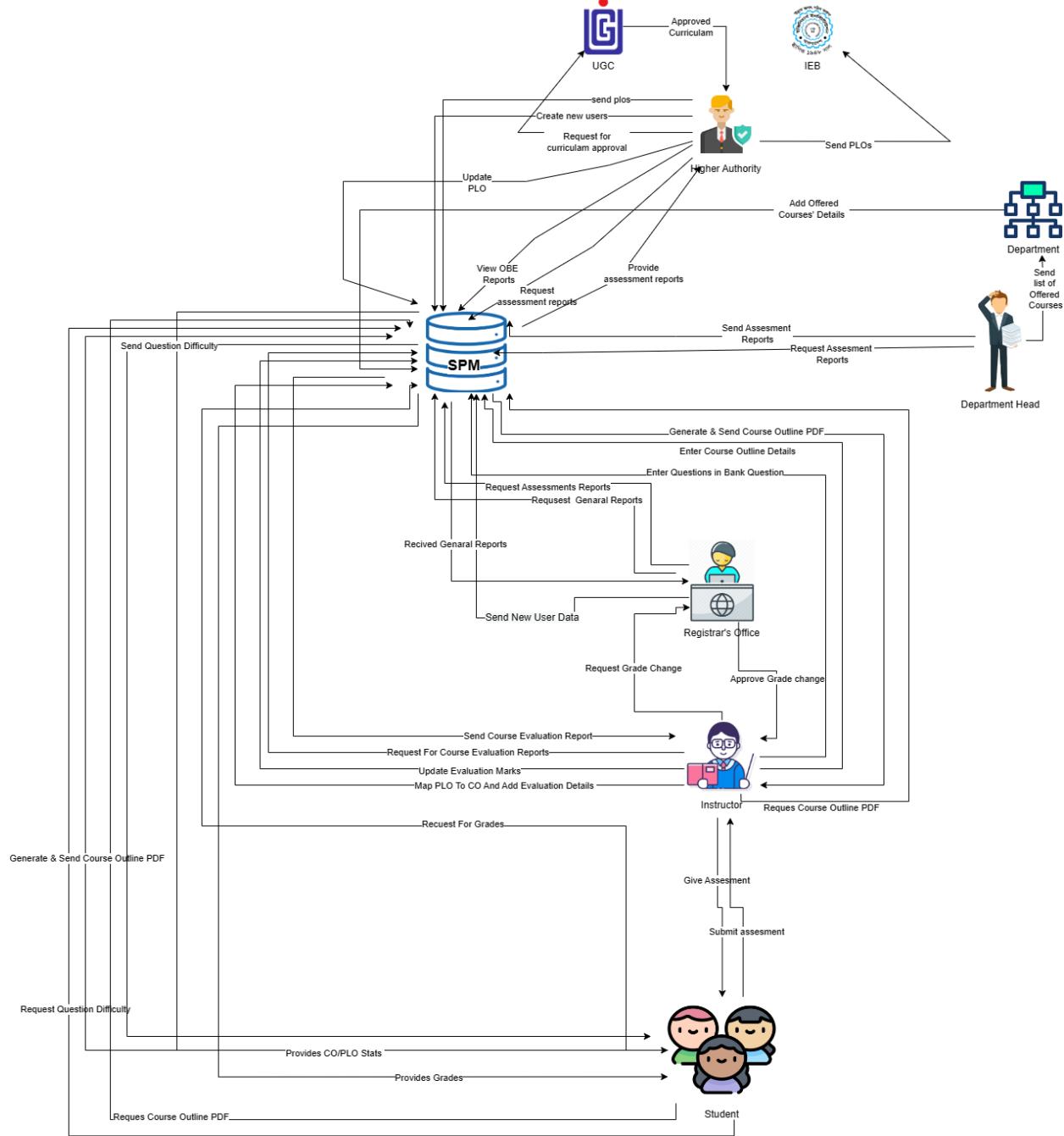
CHAPTER-2 REQUIREMENT ANALYSIS

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: | Paper and Stationery: | Computer/ Laptop | Operating Software | Register Office | Internet |

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

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| | <p>using SPMS User-ID and password.</p> <p>b) Receives the student enrollment information in the attached files.</p> <p>c) Department Head updates the student enrollment information in Database.</p> | <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a) Used to access SPM S</p> | <p>used later in SPMS.</p> | |
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|-----------------------------------|--|--|--|-------------|---|--|
| | d) Inputs the desired time period for number of students enrolled. | | | | | |
| Student Performance Based on CGPA | <p>Student:</p> <p>a) Logs into the System using Student-ID and password.</p> <p>b) Inputs the desired time - period to view self CGPA Progress.</p> | <p>Computer/ Laptop</p> <p>a)User will need a computer to access SPMS</p> <p>SPMS</p> <p>Printer</p> <p>a)Used to print out the report if need be.</p> | <p>Operating Software</p> <p>a) The user uses it to execute SPMS 2.0</p> <p>SPMS</p> <p>a) A</p> <p>a)Used to print out the report if need be.</p> | <p>SPMS</p> | <p>Internet</p> <p>a) To login into and access the SPMS it is used.</p> | |

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

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| | <p>of students.</p> <p>Faculty:</p> <p>a) Logs into the system using Faculty-ID and password.</p> <p>b) Inputs the desired time-period and program to view statistically analyzed CGPA trend</p> | | | | | |
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|---|---|---|--|---|---|-----------------|
| | of students or any individuals student those who attended the faculty's Section. | | | | | |
| Course-wise student performance based on CGPA | <p>Student:</p> <p>a) Logs into the system using Student-ID and password.</p> <p>b) Inputs the course</p> <p>c) View self</p> | <p>Computer/ Laptop</p> <p>a) User will need a computer to access SPMS</p> <p>Printer</p> <p>a) Used to print out the</p> | <p>SPMS</p> <p>a) A</p> <p>performance trend based on GPA will be generated by the software.</p> | <p>SPMS</p> <p>a) Here, the performance will be stored and updated.</p> | <p>SPMS</p> <p>a) To login into and access the SPMS it is used.</p> | <p>Internet</p> |

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| | GPA for the course. 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 Students. Faculty: | report if need be. Networking Devices (Router, Switch, Bridge, Hub); a) Used to access the Internet. | | | |
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| | a) Logs into the System using Faculty-ID and password. b) Inputs the desired time - period Course-ID under the faculty | | | | | |
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| | students who faculty's section. | | | | | |
| Selective Number of Instructor- wise student performanc e 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 | SPMS a) a) The software will produce a performance trend for a specified instructor. | SPMS a) Here, the performance will be stored and updated. | Internet a) To login into and access the SPMS it is used. | |

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| | <p>students for a selective number of Instructors.</p> <p>Faculty: a) Logs into the system using Faculty-ID and password. b) Inputs the desired time - period & Course-ID c) View statistically analyzed</p> | <p>Bridge, Hub): a)Used to access the Internet.</p> | | | |
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| | GPA trend of students for a selective number of Instructors. GPA trend of students for a selective number of Instructors. | | | | | |
| Department Head wise student performanc e | Department Head : a) Logs into the system using User- ID | Computer/ Laptop | SPMS a) The software will produce a performance trend | SPMS a) User will need a computer to access SPMS | Database a) Here, the performance will be stored. | Internet a) To login into and access the SPM it is used. |

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

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| <p>the GPA of the students</p> <p>-I</p> <p>D and Password.</p> <p>b) Inputs a particular instructor</p> <p>Name/ID</p> <p>c) View the student performance</p> <p>trend of selected Instructor.</p> <p>Faculty:</p> <p>a) Logs into the system</p> | <p>using Department</p> <p>D and Password.</p> <p>b) Inputs a particular instructor</p> <p>Name/ID</p> <p>c) View the student performance</p> <p>trend of selected Instructor.</p> <p>Faculty:</p> <p>a) Logs into the system</p> | <p>access SPMS</p> <p>Printer</p> <p>a)Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a)Used to access the Internet.</p> | <p>performance trend</p> | <p>will be stored and updated in the database.</p> | <p>SPM it is used.</p> |
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| | <p>using User-ID and password.</p> <p>b) Input their Name/ID.</p> <p>c) View the student performance trend.</p> | | | | |
| Total PLO percentage achieved and attempted by the student along with the departmental average | <p>Student:</p> <p>a) Logs into the system using Student-ID and Password</p> <p>b) Inputs the time-period</p> | <p>Computer/Laptop</p> <p>a)User will need a computer to access SPMS</p> <p>SPMS</p> <p>Printer</p> <p>a)Used to print out the</p> | <p>Operating system</p> <p>a)Used by the SPMS</p> <p>SPMS</p> <p>a)A comparison of the attempted vs. achieved</p> <p>PLO as well as</p> | <p>SPMS</p> <p>Database</p> <p>a) Here, the performance will be stored.</p> | <p>Internet</p> <p>a) To login into and access the SPM it is used.</p> |

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

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| | b) Inputs the time- period c) Views the comparison of students attempted PLO vs achieved PLO percentage along with the department al average. Faculty: a) Logs into the system using User- ID and | | | | | |
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| | <p>Password.</p> <p>b) Inputs the time period.</p> <p>c) Views the comparison of students attempted PLO vs achieved PLO percentage along with the departmental Average.</p> | | | | |
| PLO achievement | <p>Student:</p> <p>a) Logs into the system</p> | | <p>Computer/ Laptop</p> <p>a) A PLO achievement</p> | <p>SPMS</p> <p>SPMS Database</p> | <p>Internet</p> <p>a) To login into and</p> |

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

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

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

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

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

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| | 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 | | | |
|--|---|--|--|--|--|

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|----------------|--|---|--|--|--|--|
| | assessment type. e) Uploads questions | | | | | |
| Course Outline | Student: a) Logs into the system using Student-ID and password. b) Selects Course 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 a) Used to print out the report if need be. Networking Devices (Router, Switch, | SPMS a) The course Outline will be stored and updated in the database | SPMS a) The course Outline will be stored and updated in the database | Internet a) To login into and access the SPMS it is used. |

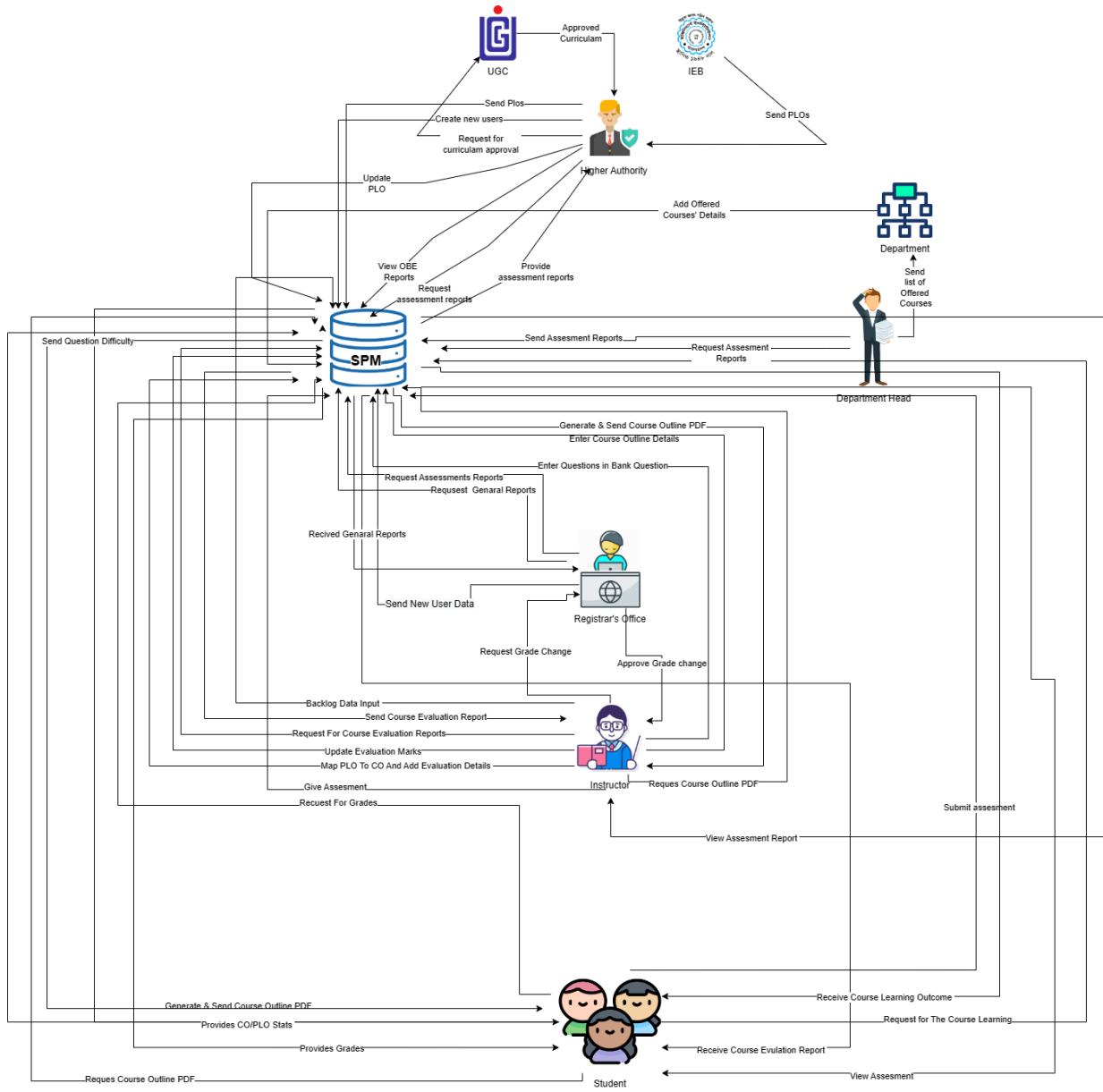
| | | | | | | |
|--|--|--|--|--|--|--|
| | d)Downloads course outline. Faculty: a) Logs into the System using Faculty-ID and password. b) Selects Course Outline c) Views form d)Selects course, section and semester. e)Uploads course outline | | Bridge, Hub); a)Used to access the Internet | | | |
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EXISTING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

| | | | | | | |
|--|---|--|---|--|--|--|
| | <p>option.</p> <p>c) Fill up the form with required Information.</p> <p>Department Head : Department Head logs into the system using SPMS User-ID and password. Receives the student enrollment information in the attached files.</p> <p>Department Head updates the student enrollment information in Database.</p> <p>d) Inputs the desired time period for number of students enrolled.</p> | | <p>b) Users will use the computer to view the data.</p> <p>Database Server</p> <p>a) Used by SPMS Developers to collect data and maintain the software.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a) Used to access SP MS</p> | <p>up the form from the website.</p> <p>SPMS</p> <p>a) The software for which the administrator will set up user accounts.</p> | <p>sending to SPMS.</p> <p>SPMS</p> <p>a) For any upgrades or new user accounts, information is kept in the database.</p> <p>Excel</p> <p>a) Data from student accounts may be kept in an excel file and used later in SPMS.</p> | <p>the student to registrar office.</p> <p>c)The Registrar office sends all the student information to SPMS Department Head by using it.</p> |
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| 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 access 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. |
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| | <p>time period to view self CGPA Progress.</p> <p>Department Head:</p> <p>a) Logs into the System using User-ID and password.</p> <p>b) Inputs the desired time period and School, Department or program to view Statistically and analyzed</p> | | <p>the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a)Used to access the Internet.</p> | <p>generated by the software.</p> | | |
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| | <p>CGPA trend of students.</p> <p>Faculty:</p> <p>a) Logs into the system using Faculty ID and password.</p> <p>b) Inputs the desired time-period and program to view statistically analyzed CGPA trend</p> | | | | |
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| | of students or any individuals studet those who attended the faculty's Section. | | | | | |
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| <p>Coursewise student performance based on CGPA</p> | <p>Student:</p> <ul style="list-style-type: none"> a) Logs into the system using StudentID and password. b) Inputs the course c) View self GPA for The | <p>Computer/</p> <ul style="list-style-type: none"> Laptop a) User will need a computer to access SPMS | <p>SPMS</p> <ul style="list-style-type: none"> a) A performance trend based on GPA will be generated by the software. | <p>SPMS</p> <ul style="list-style-type: none"> a) Here, the performance will be stored and updated. | <p>Database</p> | <p>Internet</p> <ul style="list-style-type: none"> a) To login into and access the SPMS it is used. |
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password.
b) Inputs
the desired
time
-
period
Course-ID
under the
faculty
c) view
statistically
analyzed
GPA trend
of students
who
faculty's
section.

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| <p>Selective Number of Instructor wise student performance based on the GPA</p> | <p>Department Head :</p> <p>a) Logs into the system using User-ID and password.</p> | <p>Computer/ Laptop</p> <p>a) User will need a computer to access SPMS</p> | <p>SPMS</p> <p>a) a) The software will produce a performance trend for a specified instructor.</p> | <p>SPMS</p> <p>a) Here, the performance will be stored and updated.</p> | <p>Internet</p> <p>a) To login into and access the SPMS it is used.</p> |
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| | 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. Networking Devices (Router, Switch, Bridge, Hub): a)Used to access the Internet. | | | |
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| | b) Inputs the desired time - period & Course -ID c) View statisticall y analyzed GPA trend of students for a selective number of Instructors . . GPA trend of students for a selective number of Instructors . . | | | | | | |
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| <p>Department Head wise student performance</p> | <p>Department Head :</p> <p>a) Logs into the system using User-ID and password.</p> <p>b) Select Input from from VC/Dean/ Department Head</p> <p>c) View the student performance trend as per choice.</p> | <p>Computer/ Laptop</p> <p>a)User will need a computer to access SPMS</p> <p>Printer</p> <p>a)Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a)Used to access the Internet.</p> | <p>SPMS</p> <p>a) software will produce a performance trend</p> | <p>The</p> <p>The performance will be stored and updated in the database</p> | <p>SPMS</p> <p>Database</p> | <p>Internet</p> <p>a) To login into and access the SPM it is used.</p> |
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| <p>Instructor Wise student based on the GPA of the students</p> <p>Performance system using Department-I D and Password.</p> <p>b) Inputs a particular instructor Name/ID</p> <p>c) View the student performance trend of selected Instructor</p> <p>Faculty:</p> <p>a) Logs into the system using User-ID And password.</p> <p>b) Input their Name/ID.</p> <p>c) View the student performance trend.</p> | <p>a) Logs into the system using Department-I D and Password.</p> <p>b) Inputs a particular instructor Name/ID</p> <p>c) View the student performance trend of selected Instructor</p> <p>Faculty:</p> <p>a) Logs into the system using User-ID And password.</p> <p>b) Input their Name/ID.</p> <p>c) View the student performance trend.</p> | <p>a) User will need a computer to access SPMS</p> <p>Printer</p> <p>a) Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a) Used to access the Internet.</p> | <p>SPMS</p> <p>a) The software will produce a performance trend</p> | <p>The performance will be stored and updated in the database</p> | <p>a) To login into and access the SPM it is used.</p> |
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| Total PLO percentage achieved and attempted by the student along with the departmental average | <p>Student:</p> <ul style="list-style-type: none"> a) Logs into the system using Student-ID and Password b) Inputs the time-period c) Views their comparison of attempted | <p>Computer/ Laptop</p> <p>a) User will need a computer to access SPMS</p> <p>Printer</p> <p>a) Used to print out the report if need be.</p> <p>Networking Devices (Router,</p> | <p>Operating system</p> <p>a) Used by the SPMS</p> <p>SPMS</p> <p>a) A comparison of the attempted vs. achieved PLO as well as the departmental average will be produced by the software.</p> | <p>SPMS</p> <p>a) Here, the performance will be stored.</p> | <p>Database</p> <p>a) To login into and access the SPM it is used.</p> |
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| | <p>vs achieved PLO percentage along with the departmental Average.</p> <p>Department Head :</p> <p>a) Logs into the system using User-ID and Password</p> <p>b) Inputs the time-period</p> <p>c) Views the comparison of</p> <p>d) students attempted PLO vs achieved PLO percentage along with the departmental average.</p> <p>Registrar'</p> | <p>Switch, Bridge, Hub):</p> <p>a) Used to access the Internet.</p> | | | |
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| | <p>s office:</p> <ul style="list-style-type: none">a) Logs into the system using User-ID and Passwordb) Inputs the time periodc) Views the comparison of students Attempted PLO vs achieved PLO percentage along with the departmental average. <p>Faculty:</p> <ul style="list-style-type: none">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 | | | | | |
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| | <p>along with the departmental Average.</p> <p>Dean</p> <p>a) Logs into the system using User ID and Password</p> <p>b) Inputs the time period</p> <p>c) Views the comparison of students Attempted PLO vs achieved PLO percentage along with the departmental average.</p> <p>VC</p> <p>a) Logs into the system using User-ID and Password.</p> <p>b) Inputs the time period.</p> <p>c) Views the comparison of students attempted PLO vs achieved PLO percentage</p> | | | | |
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| | along with the departmental average. | | | | | |
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| 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 a) Here, the performance will be stored and updated. | Database | a) To login into and access the SPMS it is used. |
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| | 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. | | | | | |
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| | b) Selects PLO achievement. c) View PLO Achievement | | | | | |
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| <p>Expected PLO achievement versus actual score (for course's, student's, Department's, program's or school's)</p> | <p>Student:</p> <ul style="list-style-type: none"> a) Logs into the system using StudentID and password. b) Selects PLO achievement comparison c) View PLO achievement Comparison. | <p>Computer/ Laptop a)User will need a computer to access SPMS</p> <p>Printer a)Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub): a)Used to</p> | <p>SPMS a) A) The software will calculate the expected vs. achieved PLO.</p> | <p>SPMS a) Database The performance will be stored and updated in the database.</p> | <p>Internet a) To login into and access the SPMS it is used.</p> |
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| | <p>Department Head :</p> <p>a) Logs into the system using user-ID and password.</p> <p>a) Selects PLO achievement comparison</p> <p>b) View PLO achievement Comparison.</p> <p>Faculty:</p> <p>a) Logs into the System using</p> | access the Internet. | | | |
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| | <p>FacultyID and password.</p> <p>b) Selects PLO achievement comparison.</p> <p>c) view PLO Achievement comparison.</p> | | | | | |
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| CO-PLO achievement summary | <p>Student:</p> <p>a) Logs into the system using StudentID and password.</p> <p>b) Selects CO -PLO</p> | | <p>Computer/ Laptop</p> <p>a)User will need a computer to access SPMS</p> <p>Printer</p> <p>a)Used to print out the report if need be.</p> | <p>SPMS</p> <p>a)The software will produce a summary of CO-PLO accomplishments.</p> | <p>SPMS</p> <p>a)The Summary will be stored and updated in the database.</p> | <p>Internet</p> <p>a) To login into and access the SPMS it is used.</p> |
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| | <p>achievement summary.</p> <p>c) View CO-PLO achievement summary.</p> <p>Department Head :</p> <p>a) Logs into the system using user-ID and password.</p> <p>b) Selects CO -PLO achievement summary.</p> <p>c) View CO - PLO achievement Summary.</p> | <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a)Used to access the Internet.</p> | | |
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| | <p>Faculty:</p> <p>a) Logs into the system using FacultyID and password.</p> <p>b) Selects CO -PLO achievement summary.</p> <p>c) View CO - PLO achievement Summary.</p> | | | | | |
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| 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 a) The Question Bank | Database a) The Question Bank | Internet a) To login into and access the SPMS it is used. |
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| | <p>StudentID and password.</p> <p>b) Selects Question Bank</p> <p>c) Views form</p> <p>d)Selects course, section and semester and assessment type.</p> <p>d)Downloads questions</p> <p>Faculty:</p> <p>a) Logs into the System using Faculty-ID and</p> | <p>to access SPMS</p> <p>Printer</p> <p>a)Used to print out the report if need be.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>a)Used to access the Internet</p> | | <p>will be stored and updated in the database</p> |
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| | <p>password.</p> <p>b) Selects question bank</p> <p>c) Views form</p> <p>d) Selects course, section and semester and assessment type.</p> <p>e) Uploads questions</p> | | | | | |
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| Backlog Records | <p>Student:</p> <p>Logs into the system using StudentID and password.</p> <p>Selects Course Outline</p> | <p>Computer/ Laptop</p> <p>a)User will need a computer to access SPMS</p> <p>Printer</p> <p>a)Used to print out</p> | <p>SPMS</p> <p>a)The software will generate course Outline</p> | <p>SPMS</p> <p>a) Database</p> <p>a) The Couse Outline will be stored and updated in the database</p> | <p>Internet</p> <p>a) To login into and access the SPMS it is used.</p> |
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| | 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 | | |
|--|--|--|---|--|--|

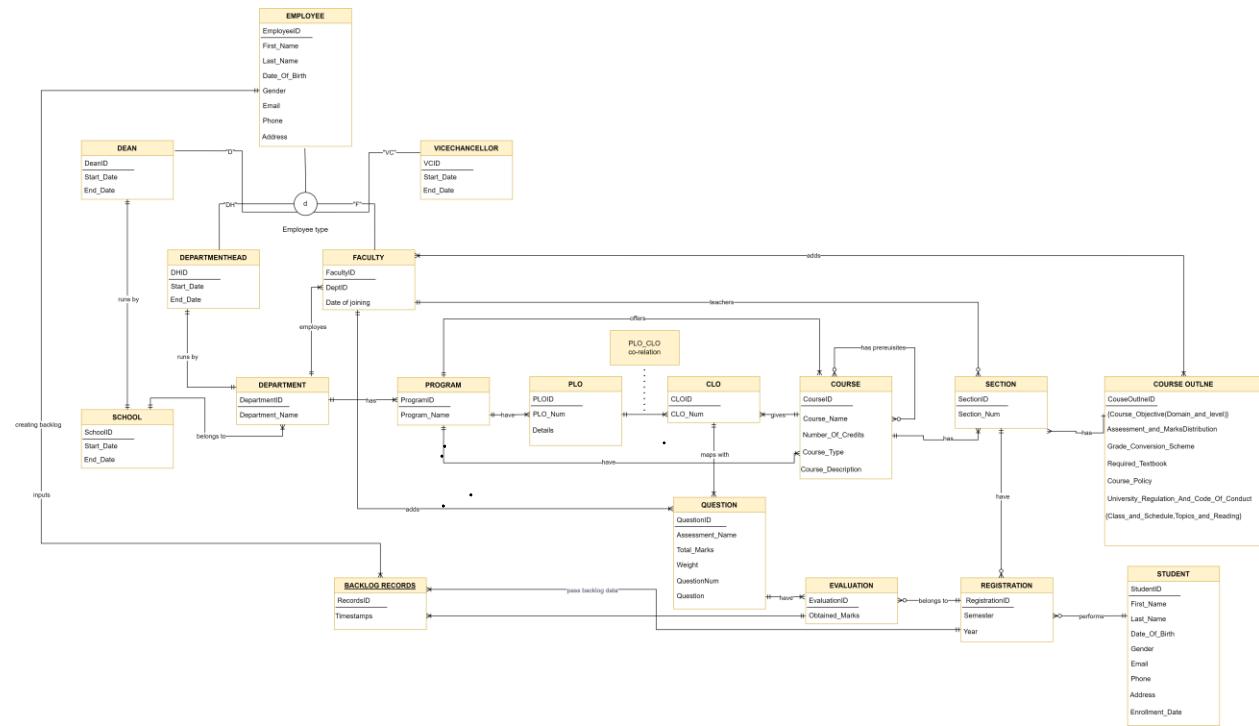
CH-3 LOGICAL SYSTEM DESIGN

BUSINESS RULES

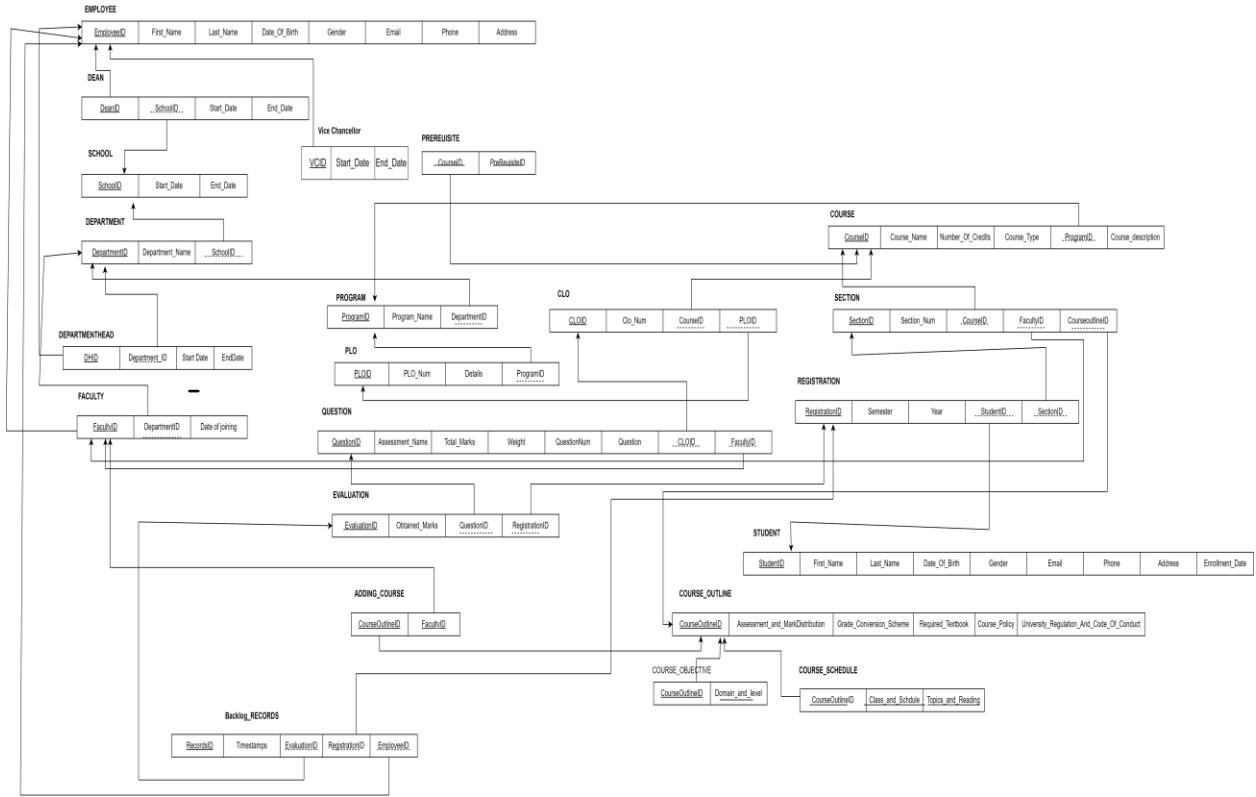
1. A **STUDENT** will have a department. A Student has **StudentID**, Name consisting of first name and last name, DateOfBirth, Email. A **student** will have one department, but a **department** will have many students.
2. A **DEPARTMENT** includes **DepartmentID**, DepartmentName. A Department will 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:



NORMALIZATION:

Normal Form

| | | |
|-----------------|---------------|----|
| Employee | EmployeeID | a1 |
| | First_Name | a2 |
| | Last_Name | a3 |
| | Date_of_Birth | a4 |
| | Gender | a5 |
| | Email | a6 |
| | Phone | a7 |
| | Address | a8 |
| Vice-Chancellor | VCID | b1 |
| | Start_Date | b2 |
| | End_Date | b3 |
| Dean | DeanID | c1 |
| | Start_Date | c2 |
| | End_Date | c3 |
| | SchoolID | g1 |
| Department Head | DHID | d1 |
| | Start_Date | d2 |

| | | |
|------------|-----------------|----|
| | End_Date | d3 |
| | DepartmentID | h1 |
| Faculty | FacultyID | e1 |
| | DepartmentID | h1 |
| | Date of joining | e2 |
| Student | StudentID | f1 |
| | First_Name | f2 |
| | Last_Name | f3 |
| | Date_of_birth | f4 |
| | Gender | f5 |
| | Email | f6 |
| | Phone | f7 |
| | Address | f8 |
| | Enrollment_Date | f9 |
| School | SchoolID | g1 |
| | Start_Date | g2 |
| | End_Date | g3 |
| Department | DepartmentID | h1 |
| | Department_Name | h2 |

| | | |
|---------|--------------------|----|
| | SchoolID | g1 |
| Program | ProgramID | i1 |
| | Program_Name | i2 |
| | DepartmentID | h1 |
| PLO | PLOID | j1 |
| | PLO_Num | j2 |
| | Details | j3 |
| | ProgramID | i1 |
| CLO | CLOID | k1 |
| | CLO_Num | k2 |
| | CourseID | l1 |
| | PLOID | j1 |
| Course | CourseID | l1 |
| | Course_Name | l2 |
| | Number_Of_Credits | l3 |
| | Course_Type | l4 |
| | Course Description | l5 |
| | ProgramID | i1 |
| Section | SectionID | m1 |

| | | |
|----------------|-----------------|----|
| | Section_num | m2 |
| | FacultyID | e1 |
| | CourseID | l1 |
| | CourseOutlineID | r1 |
| Course records | RecordsID | n1 |
| | Timestamps | n2 |
| | EvaluationID | p1 |
| | EmployeeID | a1 |
| | RegistrationID | q1 |
| Question | QuestionID | o1 |
| | Assessment_Name | o2 |
| | Total_Marks | o3 |
| | Weight | o4 |
| | QuestionNum | o5 |
| | Question | o6 |
| | FacultyID | e1 |
| | CLOID | k1 |
| Evaluation | EvaluationID | p1 |
| | Obtained Marks | p2 |

| | | |
|------------------|---|----|
| | QuestionID | o1 |
| | RegistrationID | q1 |
| Registration | RegistrationID | q1 |
| | Semester | q2 |
| | Year | q3 |
| | StudentID | f1 |
| | SectionID | m1 |
| Course Outline | CourseOutlineID | r1 |
| | Assessment_and_MarksDistribution | r2 |
| | Grade_Conversion_Scheme | r3 |
| | Required_Textbook | r4 |
| | Course_Policy | r5 |
| | University_Regulation_And_Code_Of_Conduct | r6 |
| Course_Objective | CourseOutlineID | r1 |
| | Domain_And_Level | s1 |
| Course_Schedule | CourseOutlineID | r1 |
| | Topic_And_Reading | t1 |
| | Class_And_Schedule | t2 |
| Adding_Course | CourseOutlineID | r1 |

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| | Faculty_ID | e1 |
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|---------------|--|
| SchoolID→ | Start_Date, End_Date |
| DepartmentID→ | DepartmentName, SchoolID |
| ProgramID→ | ProgramName, DepartmentID |
| EmployeeID→ | First_Name, Last_Name, Gender, DateOfBirth, Email ,Phone , address |
| VCID→ | StartDate, EndDate |
| DeanID→ | Start_Date, End_Date, SchoolID |
| DHID→ | Start_Date, End_Date, DepartmentID |
| FacultyID→ | JoinDate, DepartmentID |
| StudentID→ | First_Name, Last_Name, DateOfBirth, Gender, Email, Phone, address, Enrollment_date |
| CourseID→ | CourseName, Num_Of_Credits, CourseType, Course_description, ProgramID |

| | |
|-----------------------|---|
| SectionID→ | Section_num, FacultyID, CourseID, Course_OutlineID |
| PLOID→ | PLO_Num, Details, ProgramID |
| CLOID→ | CLO_Num, CourseID, PLO_ID |
| RegistrationID→ | Semester, Year, SectionID, StudentID |
| RecordsID→ | Timestamps, EvaluationID, EmployeeID, RegistrationID |
| QuestionID→ | Assesment_Name, Total_Marks, Weight, QuestionNum, Question, FacultyID, CLO_ID |
| CourseOutlineID→ | Course_Objective, Assesment_&_MarksDistribution, Grade_Conversion_Scheme, Required_textbook, Course_policy, University_Regulation_And_Code_Of_Conduct |
| EvaluationID→ | ObtainedMarks, QuestionID, RegistrationID |
| Course _Objective→ | CourseOutlineID, Domain_And_Level |
| Course_Schedule→ | CourseOutlineID, Topic_And_Reading, Class_And_Schedule |
| Adding_Course→ | CourseOutlineID, Faculty_ID |

| | |
|------------|--------------------------------|
| g1→ | g2, g3 |
| h1→ | h2, g1 |
| i1→ | i2, h1 |
| a1→ | a2, a3, a4, a5, a6, a7, a8 |
| b1→ | b2, b3 |
| c1→ | c2, c3, g1 |
| d1→ | d2, d3, h1 |
| e1→ | e2, h1 |
| f1→ | f2, f3, f4, f5, f6, f7, f8, f9 |
| l1→ | l2, l3, l4, l5, i1 |
| m1→ | m2, m3, e1, l1, r1 |
| j1→ | j2, j3, i1 |
| k1→ | k2, l1, j1 |
| q1→ | q2, q3, f1, m1 |
| n1→ | n2, p1, a1, q1, |
| o1→ | o2, o3, o4, o5, o6, e1, k1 |
| r1→ | r2, r3, r4, r5, r6 |
| p1→ | p2, o1, q1 |

1NF:

| T1 | a1 | a2 | a3 | a4 | a5 | a6 | a7 | a8 | <u>b1</u> | b2 | b3 | c1 |
|----|----|----|----|----|----|----|----|----|-----------|----|----|----|
| c2 | c3 | g1 | d1 | d2 | d3 | h1 | e1 | e2 | f1 | f2 | f3 | |
| i4 | i5 | i6 | i7 | i8 | i9 | i1 | i2 | i3 | i4 | i5 | i6 | |
| m1 | m2 | m3 | r1 | j1 | j2 | j3 | k1 | k2 | q1 | q2 | q3 | |
| n1 | n2 | p1 | o1 | o2 | o3 | o4 | o5 | o6 | r2 | r3 | r4 | |
| r5 | r6 | p2 | n2 | g2 | g3 | | | | | | | |

2NF:

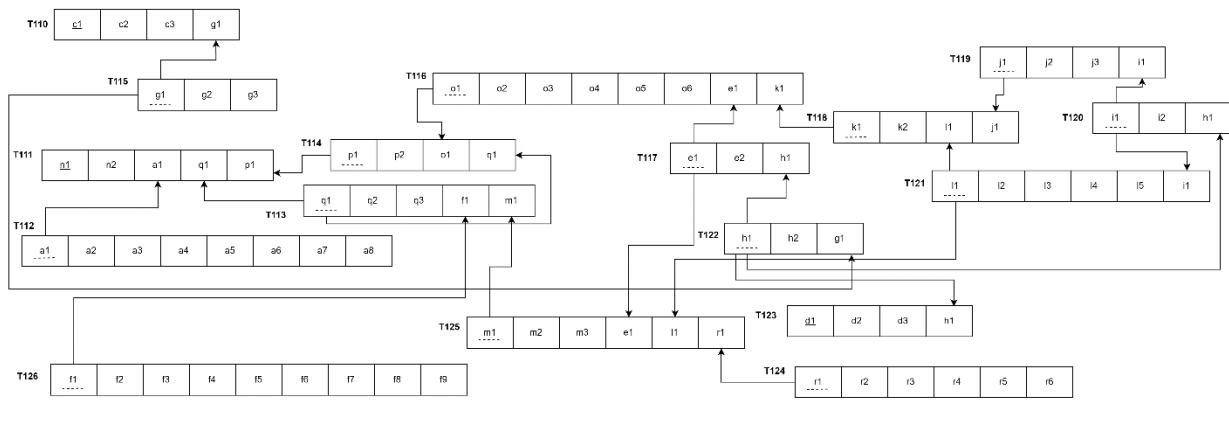
| | | | | |
|-----|----|----|----|----|
| T13 | a1 | c2 | c3 | g1 |
|-----|----|----|----|----|

| | | | | |
|-----|----|----|----|----|
| T12 | d1 | d2 | d3 | h1 |
|-----|----|----|----|----|

| T11 | n1 | r2 | a1 | a2 | a3 | a4 | a5 | a6 | a7 | a8 | b1 | b2 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|
| b3 | g1 | p1 | r2 | r3 | r4 | h1 | e1 | e2 | i1 | i2 | f3 | |
| i4 | i5 | i6 | i7 | i8 | i9 | i1 | i2 | i3 | i4 | i5 | i6 | |
| 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:



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 | These are 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 | This is enrollment date of the student. E.g.: “1-1-2019” |

| | | | |
|---------------|---------|------|---|
| | | YYYY | |
| 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 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....” |
| 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." |
| cAssessmentAndMarks Distribution | 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" |
| cRequiredTextbook | 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." |
| cCoursePolicy | 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:

The image shows the homepage of the Student Performance Monitoring System (SPMS). At the top, there is a navigation bar with a user icon, the text "STUDENT PERFORMANCE MONITORING SYSTEM", and a "LOGIN" button. Below the navigation bar is a large banner featuring two illustrations: one on the left showing a person working at a computer with gears and charts, and one on the right showing a person sitting at a desk with a laptop, surrounded by various performance metrics and charts.

Hall Of Fame!

IUB FABSAT
TEAM IUB FABSAT SELECTED FOR AMERICAN ASTRONAUTICAL SOCIETY: STUDENT CANSAT COMPETITION

The First-Ever team from Bangladesh selected for the global trials of CanSat competition.

The Independent University, Bangladesh (IUB) has once again made the country proud by securing a place in the American Astronautical Society(AAS) Student CanSat Competition which is sponsored by organizations like NASA, US NAVAL Research Laboratory, Virginia Tech, Lockheed Martin... [See more...](#)

The main content area features a "Hall Of Fame!" section highlighting the IUB FABSAT team's selection for the American Astronautical Society: Student CanSat Competition. It includes a small image of a satellite and text about the team's achievement. Below this is a "LOGIN" form with fields for "STUDENT" (containing "1921629") and a password field (containing "....."). A blue "LOGIN" button is at the bottom of the form. The footer contains a URL and a copyright notice: "www.iub.edu.bd/articles/index/1959/team-iub-fabsat-selected-for-American-Astronautical-Society-Student-Cansat-Competition" and "© 2023 SPMS. All rights reserved by Failure DataBees."

Backlogged Student Data Entry Form

Backlogged Student Data Entry Form

| | |
|------------------------------|---|
| Student ID: | 1921629 |
| Educational Year: | 2019 |
| Educational Semester: | SUMMER |
| Enrolled Course: | CSE461 |
| Enrolled Section: | 1 |
| Obtained Grade: | A |
| Faculty ID: | 4999 |
| Upload a file: | <input type="radio"/> Yes <input checked="" type="radio"/> No |
| SUBMIT | |

Backlogged Students Data Table:

| Backlogged Students Data Table | | | | | | | | | |
|--------------------------------|------|----------|--------|---------|-------|-----|-----|-----|---------------------|
| ID | Year | Semester | Course | Section | Grade | C01 | C02 | C03 | Date |
| 1721623 | 2016 | Summer | CSE | 4 | A- | 85 | 85 | 85 | 2023-04-27 09:44:35 |
| 1721624 | 2016 | Summer | EEE | 2 | A | 90 | 90 | 90 | 2023-04-27 09:44:35 |
| 1721625 | 2016 | Autumn | BBA | 2 | B+ | 80 | 80 | 80 | 2023-04-27 09:44:35 |
| 1721626 | 2018 | Summer | CSE | 1 | B+ | 80 | 80 | 80 | 2023-04-27 09:44:35 |
| 1721627 | 2016 | Summer | EEE | 4 | A | 90 | 90 | 90 | 2023-04-27 09:44:35 |
| 1721628 | 2016 | Summer | BBA | 3 | A- | 85 | 85 | 85 | 2023-04-27 09:44:35 |
| 1721629 | 2019 | Summer | CSE | 4 | F | 0 | 0 | 0 | 2023-04-27 09:44:35 |
| 1721630 | 2016 | Spring | EEE | 5 | B | 75 | 75 | 75 | 2023-04-27 09:44:35 |
| 1721631 | 2016 | Summer | BBA | 3 | D | 45 | 45 | 45 | 2023-04-27 09:44:35 |
| 1721632 | 2016 | Autumn | CSE | 5 | C+ | 65 | 65 | 65 | 2023-04-27 09:44:35 |
| 1721633 | 2015 | Summer | EEE | 2 | C | 60 | 60 | 60 | 2023-04-27 09:44:35 |
| 1721634 | 2016 | Summer | BBA | 1 | B- | 70 | 70 | 70 | 2023-04-27 09:44:35 |
| 1600000 | 2016 | Spring | CSE303 | 1 | A | 90 | 90 | 90 | 2023-04-27 09:43:54 |
| 1821623 | 2016 | Summer | CSE | 4 | A- | 85 | 85 | 85 | 2023-04-26 22:33:56 |

Add exam data entry form:

STUDENT PERFORMANCE MONITORING SYSTEM

LOGOUT

INTRODUCTION TO PROGRAM

CSC101

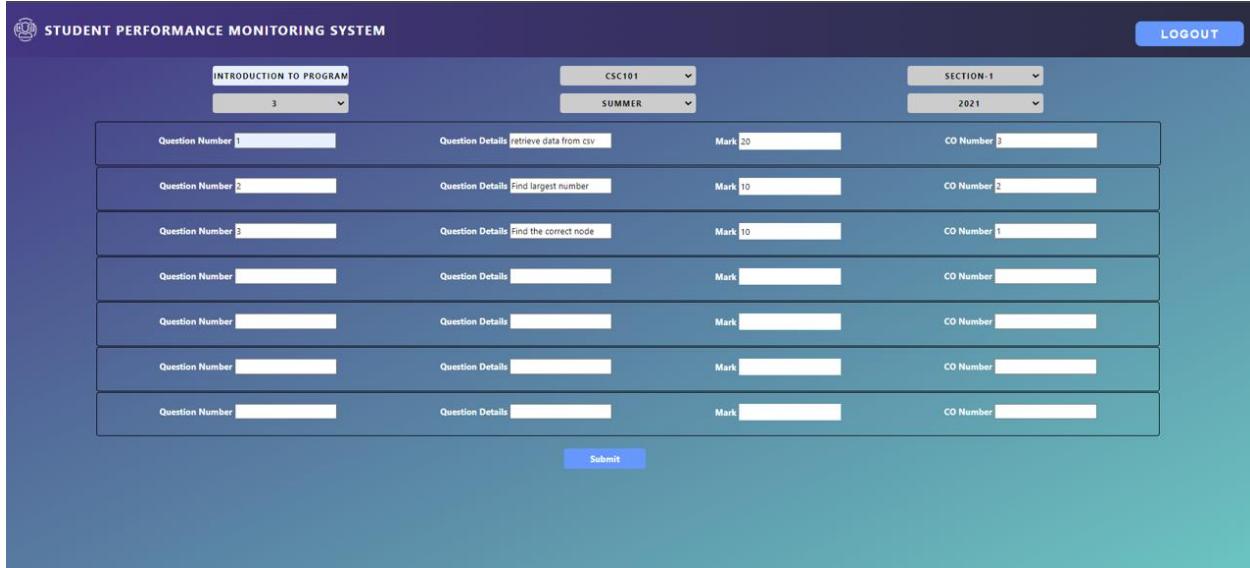
SECTION-1

SUMMER

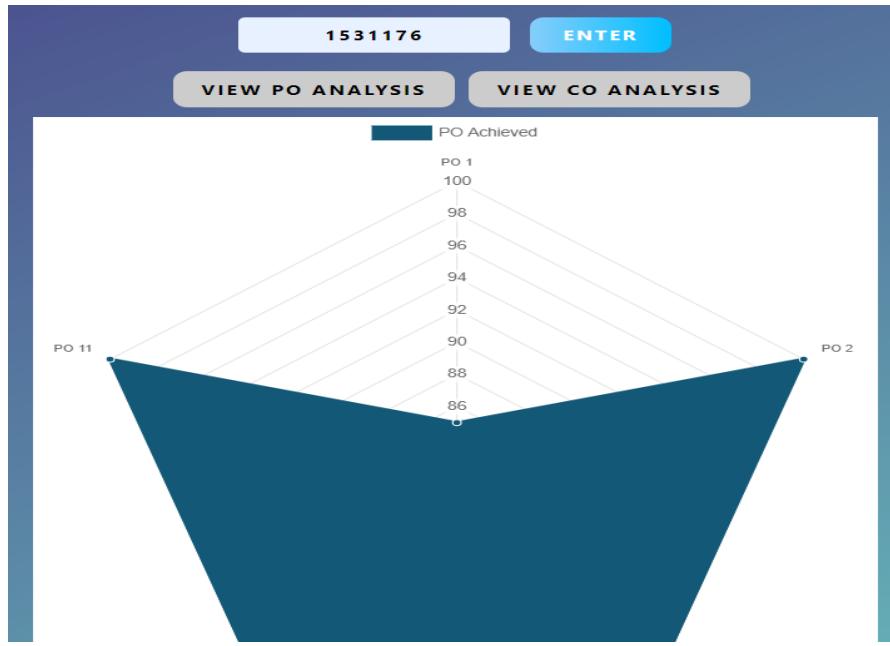
2021

| Question Number | Question Details | Mark | CO Number |
|-----------------|------------------------|------|-----------|
| 1 | retrieve data from csv | 20 | 3 |
| 2 | Find largest number | 10 | 2 |
| 3 | Find the correct node | 10 | 1 |
| | | | |
| | | | |
| | | | |
| | | | |

Submit



PLO Analysis Spider Chart:



Plo Analysis with Department Average Bar Chart:



Code For Backlogged Data Retrieving from CSV And Inserting Into Section Table, Registration Table & Student Course Performance Table For Updating PLO, CLO Analysis:

```

if(isset($_POST['add_csv'])){
    $fileName = $_FILES["file"]["tmp_name"];
    $faculty_id = $_POST['faculty_id'];
    if($_FILES["file"]["size"]>0){
        $file = fopen($fileName,"r");
        fgetcsv($file);
        while(($column = fgetcsv($file,10000,",")) != False){
    
```

```
$sqlInsert = "INSERT INTO section_t (sectionNum,semester,courseID,facultyID,year) VALUES
('" . $column[4] . "','" . $column[2] . "','" . $column[3] . "','" . $faculty_id . "','" . $column[1] . "')";

$result1 = mysqli_query($conn, $sqlInsert);

$sqlInsert5 = "INSERT INTO std_data(ID,Year,Semester,Course,Section,Grade,CO1,CO2,CO3,Date) VALUES
('" . $column[0] . "','" . $column[1] . "','" . $column[2] . "','" . $column[3]
. "','" . $column[4] . "','" . $column[5] . "','" . $marks . "','" . $marks . "','" . $marks . "',NOW())";

$result5 = mysqli_query($conn, $sqlInsert5);

if (!empty($result1)) {
    $last_insert_id = mysqli_insert_id($conn);

    $query2 = "INSERT INTO registration_t (sectionID,studentID) VALUES ($last_insert_id, '" . $column[0] . "')";
    $result2 = mysqli_query($conn, $query2);
}

if (!empty($result2)) {
    $last_insert_id_2 = mysqli_insert_id($conn);

    $query3 = "INSERT INTO student_course_performance_t (registrationID,totalMarksObtained,gradePoint) VALUES
($last_insert_id_2, $marks, $grade_point)";      You, 1 second ago * Uncommitted changes
mysqli_query($conn, $query3);

} else {
    echo "error";
}
```

Code for Showing Backlogged Data Table:

```
$sql = "SELECT * FROM std_data ORDER BY Date DESC";
$result = mysqli_query($conn, $sql); //will return row number
if (mysqli_num_rows($result) > 0) {
    echo "<table>";
    echo "<tr>";
    echo "<th>ID</th>";
    echo "<th>Year</th>";
    echo "<th>Semester</th>";
    echo "<th>Course</th>";
    echo "<th>Section</th>";
    echo "<th>Grade</th>";
    echo "<th>CO1</th>";
    echo "<th>CO2</th>";
    echo "<th>CO3</th>";
    echo "<th>Date</th>";
    echo "</tr>";
    while ($row = mysqli_fetch_assoc($result)) { //will fetch rows from result set
        echo "<tr>";
        echo "<td>" . $row['ID'] . "</td>";
        echo "<td>" . $row['Year'] . "</td>";
        echo "<td>" . $row['Semester'] . "</td>";
        echo "<td>" . $row['Course'] . "</td>";
        echo "<td>" . $row['Section'] . "</td>";
        echo "<td>" . $row['Grade'] . "</td>";
        echo "<td>" . $row['CO1'] . "</td>";
        echo "<td>" . $row['CO2'] . "</td>";
        echo "<td>" . $row['CO3'] . "</td>";
        echo "<td>" . $row['Date'] . "</td>";
        echo "</tr>";
    }
    echo "</table>";
}
```

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.