Student Performance Monitoring System

Final Report

Group - 16 (Team Humpty Dumpty)

Name	ID	Section
Asif Ahmed Joy	2031264	01
Mahfuja Khanam	2021967	01
Marium Ahsan	2021817	03
Maruf Ahmed Seaum	1911258	03
Sadia Zerin Jui	2031251	03
Md Tauhid Un Noor Konoz	2022016	03

Contents

CHAPTER 1 - INTRODUCTION:

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

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

The university has been an active participant in the growth of the education sector in Bangladesh and has produced capable and knowledgeable scholars contributing both here and abroad. [1] IUB has achieved this through working closely with relevant government education institutions and organizations such as the University Grants Commission (UGC),Ministry of Education, and other necessary institutes for each of the schools, regular updating its curriculums and putting in a system to monitor student performance based on a quantified approach between course curriculum and standards set by UGC and the Bangladesh government and constantly tracking student performance for every semester – mainly, using Outcome-Based Education (OBE) for monitoring performance and setting university curriculum. [1]

The focus of this report is to study the current student performance monitoring system that IUB uses, do the required analysis of its processes, and propose a new and better improved system that reduces error, makes analysis of data and report generation easier by all vested quarters and produce/show valuable information needed for IUB and its collaborators in making necessary improvements in academia to produce better scholars. The first part focuses on the details of the organization in question and the project that we have undertaken for it. The second part focuses on the existing system and its shortcomings and an introduction of the proposed system that we plan to replace the existing system with. The third and fourth will be heavily technical and focus on how we plan to bring the proposed system into being.During our research into the existing system for student performance monitoring we have found many areas where valuable changes could be made to make each process of monitoring student performance faster, make communication between necessary stakeholders easier, take away chances for errors and data duplication, and most importantly make it easier for all stakeholders to easily surf through large datasets to get meaningful information to their requirement. As we go through this report, we will dig deeper into how the current student performance monitoring system operates, the business processes involved, where there are concerns and issues related to data management, and how we can make a better system to address these issues for fixing and improvement.

A. BACKGROUND OF THE ORGANIZATION- IUB:

Independent University, Bangladesh (IUB), established in 1993, is one of the oldest private universities in Bangladesh, currently has more than an estimated 7,048 undergraduate and graduate students and over 10,455 alumni. This student population is mostly predicted to grow at 10% annually. [2]IUB, over-time, has shown remarkable outcomes in producing graduates with marketable skills only because of staying disciplined and up to date with the on-going curriculum and progress system. Dedicating attention towards IUB's Departments, and more specifically focusing the Department of Computer Science and Electrical science into a well-funded research hub running several research projects. IUB is also committed to curve potential graduates of international standard who are mainly equipped to provide new leadership to the national economy through skilled employment, entrepreneurship and/or applied research. This is successful due to the overwhelming support of the Bangladesh Government and the UGC for IUB to be able to create state-of-the-art lab facilities in their department. It is because of IUB's approach to academics as an "Application Oriented Learning" philosophy that "not only teaches students the fundamental principles of learning, situation -handling, and have better overall perception by providing them with hands-on training sessions." [3] Continuously growing it's lab facilities and flourishing on its curriculum according to current market economic demands, the SECS and the Department of Computer Science and Engineering at IUB has constantly worked with IEB, UGC and the Ministry of Education to track their students overall performance under specific periods by quantifying specific courses and its relating assessments into measurable trackers to gain valuable insights for improvement of students over

the years as a student in a certain department. These processes and criteria credentials courses are ultimately set by IEB along with relevant government potentials to set the bar for up-coming graduating engineers from top universities in Bangladesh. These sets of standards come in the form of Program Educational Objectives (PEO)and Program Learning Outcomes (PLO) [1] for specific departments in an Accreditation Manual which are mapped to specific courses by relevant Course Instructors and Co-Ordinator. This allows the Department of CSE at IUB, SECS, IEB and all other relevant stakeholders to have a calculating assessment of the current state-of-affairs and the performance of each student under each course for every semester. This will also allow users to track performance of faculties, courses, departments and schools and provides valuable insight for making necessary improvements.

B. BACKGROUND OF THE PROJECT SPMS 3.0:

Measuring the output of students, faculties, departments, and their respective courses in order to measure their productivity in regard to the outcome relevance of the course activities. Basically, to provide a range of tools and data intended to help universities and education authorities such as IEB, UGC, as well as other stakeholders to evaluate the performance of students and inform strategies for improvements. Developing a national framework for Outcome-Based Education while at the same time leaving considerable freedom to universities in implementing local approaches.

C. OBJECTIVE OF THE PROJECT SPMS 3.0:

The SPMS 3.0 system monitors and summarizes the performances of the stakeholders - students,faculties, schools, and departments through the database of the assessments. For evaluation purposes the system would be able to store individual assessment marks (midterm, quizzes, assignment, projects, presentations and so on). As well as the marks of those assessments with respect to their Course Outcomes (CO) and Program Learning Outcomes (PLO) accordingly in the database of the system to observe the outcome and performance of the student's faculties, schools, and departments.

The students being the primary stakeholder, would be able to statistically directly monitor the overall performance to their satisfaction of certain course objectives. Hence based on their performances and faculty evaluation the higher stakeholders (Head of department and Admin) can understand and manage the degree in comparison to which different course outcomes targets and their achievements are being understood by the student, department, school, and university body as a whole. SPMS 3.0 also monitors the impact of policies against overall administrative goals and targets by the system. The system's main target is to monitor the whole university activities through the database and produce analytics for the Head of Department, Faculty, School, Students, and their Courses in a given period of time (yearly and semester wise).

D. SCOPE OF THE PROJECT:

We did a complete analysis of the existing system and found out places in the business processes which can cause severe lapses in time and communication, which we will discuss in the next chapter.

Our solution is to create a Web application, called SPMS 3.0 (Student Performance Monitoring System 3.0), using a Relational Database Management System (RDMS) to store, edit, add, and update necessary data for monitoring student performance and producing and storing related OBE data, reports, and documents. We produced potential users for the web based SPMS 3.0 system and speculated how they would be using the system and the necessary information and data they would need access to. Since the problems can arise from many points of all business processes, we will make custom user interfaces and login capabilities for all stakeholders who will also be the users of this system. Since we use a (RDBMS) for data storage, retrieving necessary files, tabular data, page layouts and reports becomes incredibly easy and allows us to interact with the necessary data to occur real- time. We also create interfaces for all users to easily access these data and use them to generate and download reports. We build an interface for faculties to be able to collaborate with each other on developing course outlines, course reports, marksheets, assessments, mapping assessments to CO's and PLOs for PLO achievements, and record assessments of students throughout the semester for all their courses.

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

CHAPTER 2 - REQUIREMENT ANALYSIS:

Requirement Analysis is the means of using industry tools, methods, and standards, to research and visualize the current system and the processes that go into the business operation of a certain organization."Requirements Analysis is the process of determining what the database is to be used for. It involves interviews with user groups and other stakeholders to identify what functionality they require from the database, what kinds of data they wish to process and the most frequently performed operations." [4]
This allows us to observe each stakeholder and how they interact with one another. We use simple notations and symbols to explain how a business process works and how to dissect it. As we shall see, this approach of analysis enables us to identify both obvious and less obvious issues with a current manual system of student performance monitoring that relies on the involvement of stakeholders and third party actors producing faults in the system.

A. RICH PICTURE – EXISTING BUSINESS SYSTEM:

A rich picture is a way to explore, acknowledge and define a situation and express it through diagrams to create a preliminary mental model and can help to open discussion and come to a broad, shared understanding of a situation.

A detailed description facilitates conversation and leads to a comprehensive knowledge that is shared by all parties. [5] The comprehensive image that is produced can help other stakeholders understand the issues with a current system while also allowing them to take into account a wide range of relevant factors.Rich pictures concentrate on both the structure and the processes of a given situation. The Rich Picture Analysis also takes into account the following:

· **Structures**

· **Processes**

· **Climate**

· **People**

· **Issues expressed by people.**

· **Conflict**

As we can see, these factors were specifically taken into consideration when creating this rich image.
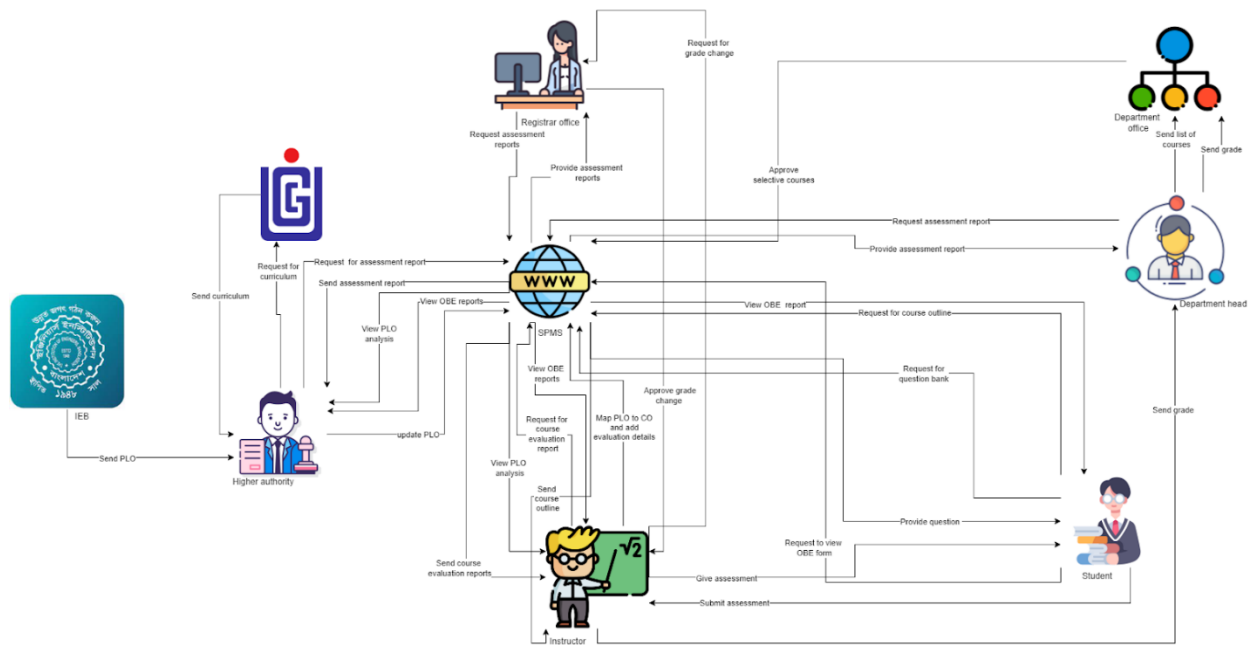
Figure 1.0: Rich Picture of Existing System to Monitor SPMS.

According to the Rich Picture Analysis, we have the following categories of stakeholders:

1. IEB
2. UGC
3. Department Head
4. Department
5. Instructor
6. Higher Authority
7. Registrar's Office
8. Admin (working under Registrar's Office)
9. Students

We can also distinguish three different storage facilities or systems, namely:

1. The Department Storage
2. The Registrar's Office Storage
3. SPMS

We have identified seven processes from this "Rich Picture" that are essential to tracking student progress and enhancing the curriculum. These are the procedures:

1. Map Course Outcomes (COs) to Program Learning Outcomes (PLOs).
2. Record Student Course Performance Data.
3. View Course Reports over a given time-period for inspection and analysis of student performance trends.
4. Produce OBE Marksheet & Bloom's Taxonomy Report.
5. View Records OBE Marksheets, Course .
6. Request for Question Bank files.
7. Request for Course Outlines.

B. SIX ELEMENTS ANALYSIS - EXISTING BUSINESS   SYSTEM:

The Six Elements Analysis gives a thorough explanation of each element's function in each process. The table below shows that Human entities predominate in all important system functions, particularly in the two processes that are most important—mapping course outcomes and viewing documents related to them. For instance, the current system is heavily reliant on manually processed and handled hardcopy databases. As a result, there is a considerable amount of waiting involved in the interdependent processes before the Human components may perform their obligations.

Process	System Role					
	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) Click on the form option. c) Fill up the form with required Information. Admin: a) Admin logs into the system using SPMS User-ID		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,	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 administrator 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,	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 admin by using it.

	and password. b) Receives the student enrollment information in the attached files. c)Admin updates the student enrollment information in Database. d) Input the desired time for number of students enrolled.		Bridge, Hub): a) Used to access the Internet		information is kept in the database. Excel: a) Data from student accounts may be kept in an excel file and used later in SPMS.	
Student Performance Based on CGPA	Student: a) Log into the System using Student ID and password. b) Input the desired time to view self CGPA Progress. Admin: a) Log into the System using User-ID and password. b) Input the desired time and School, Department or program to view Statistically and analyzed		Computer/ Laptop: a) User will need a computer. to access SPMS. Printer b) Used to print out the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a) Used to access the Internet.	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.

	CGPA trend of students. Faculty: a) Log into the system using Faculty ID and password. b) Input 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 performance based on CGPA	Student: a) Log into the system using Student ID and password. b) Input the course c) View self GPA for the course. Admin: a) Log into the System using User-ID and password. b) Input the desired time Course-ID		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):	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 statistically analyzed GPA trend of Students. Faculty: a) Log into the System using Faculty ID and password. b) Input the desired time - period Course-ID under the faculty c)view statistically analyzed GPA trend of students who faculty's section.		a) Used to access the Internet			
Selective Number of Instructorwise student performance based on the GPA	Admin: a) Log into the system using User-ID and password. b) Input the desired time Course-ID c) View statistically analyzed GPA trend of students for a selective number of Instructors . Faculty: a) Log into the system using Faculty ID 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, Switch, Bridge, Hub): a)Used to access the Internet	SPMS 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.

	password. b) Input 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					
Admin wise student performance	Admin: a) Log into the system using User-ID and password. b) Select Input from VC/Dean/ Department Head c) View the student performance trend as per choice.		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) 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
Instructor wise student performance	Admin: a) Log into the system		Computer/ Laptop	SPMS a) The software will produce a	SPMS Database	Internet

based on the CGPA of the students	using Department-ID and Password. b) Input a particular instructor Name/ID c)View the student performance trend of selected Instructor. Faculty: a) Log 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	performance trend.	a) The performance will be stored and updated in the database	a) To login into and access the SPMS it is used
Total PLO percentage achieved and attempted by the student along with the departmental average	Student: a) Log into the system using Student ID and Password b) Input the time c) Views their comparison of attempted vs achieved PLO percentage along with 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, Switch,	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 SPMS it is used

	departmental average. Admin: a) Log into the system using User-ID and Password b) Input the time period c) View the comparison of students attempted PLO vs achieved PLO percentage along with the departmental average. Faculty: a) Log into the system using User-ID and Password. b) Input the time. c) Views the comparison of students attempted PLO vs achieved PLO percentage along with the departmental average		Bridge, Hub): a)Used to access the Internet			
PLO achievement	Student: a) Log into the system		Computer/ Laptop	SPMS a) A PLO achievement will	SPMS Database	Internet

	using Student ID and password. b) Select PLO achievement c) View PLO Achievement. Admin: a) Log into the System using user-ID and password. b) Select PLO achievement c) View PLO Achievement. Faculty: a) Log into the System using Faculty ID and password. b) Select PLO Achievement. c) View PLO achievement.		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	be generated by the software.	a) Here, the performance will be stored.	a) To login into and access the SPMS it is used.
Expected PLO achievement versus actual score (for courses, students, Departments, programs, or schools)	Student: a) Log into the system using Student ID and password. b) Select PLO achievement comparison c) View PLO achievement Comparison. Admin: a) Log into the system using user-ID		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 Database a) Here, the performance will be stored.	Internet a) To login into and access the SPM it is used

	and password. b) Select PLO achievement comparison c) View PLO achievement Comparison. Faculty: a) Log into the System using Faculty ID and password. b) Select PLO achievement comparison. c) view PLO achievement comparison.		Bridge, Hub): a) Used to access the Internet			
CO-PLO achievement summary	Student: a) Log into the system using Student ID and password. b) Select CO - PLO achievement summary. c) View CO- PLO achievement summary. Admin: a) Log into the system using user-ID and password. b) Select CO - PLO		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) 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

	achievement summary. c) View CO - PLO achievement Summary. Faculty: a) Log into the system using Faculty ID and password. b) Select CO - PLO achievement summary. c) View CO - PLO achievement Summary					
Question Bank	Faculty: a) Log into the System using Faculty ID and password. b) Select question bank c)Select course, section and semester and assessment type. d) Upload questions Student: a) Log into the system using Student ID and password.		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) 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

	b) Selects Question Bank c) Views form d) Select course, section, and semester and assessment t type. d)Download questions					
Course Outline	Faculty: a) Log into the System using Faculty ID and password. b) Select Course Outline c)Selects course, section, and semester. d) Upload course outline Student: a) Log into the system using ID and password. b) Select course outline c)Select 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, Bridge, Hub): a) Used to access the Internet	SPMS a) The software will generate course outline	SPMS Database 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)Download course outline.					

E. RICH PICTURE - PROPOSED SYSTEM:

Based on the issues and issues we discovered throughout the problem analysis; we would use several user interfaces created for particular user needs. The report of a student may be viewed by the department head, dean of the school, course instructor, coordinator, faculty, administrative assistant, student, IEB, UGC, ministry of education, vice chancellor, board of trustees, and department staff, among other state parties.
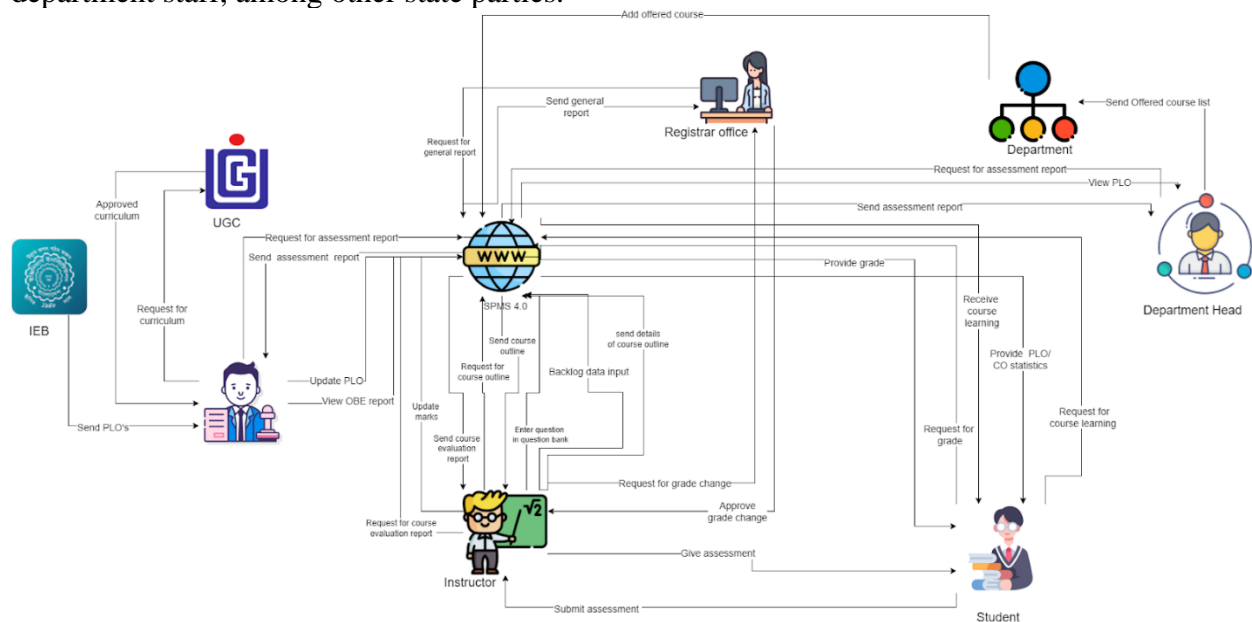

Figure 1.2: Rich Picture of Proposed System to Monitor Student Performance.

F. SIX ELEMENTS ANALYSIS – PROPOSED SYSTEM:

The new system, an online platform called SPMS, where it will have its own database that host the data of all the courses, faculties, as well as updated tables every semester to keep track of which courses have been assigned to which faculties in a given semester, will make the Course Outcomes (COs) and Program Learning Outcomes (PLOs) visible. We are developing the new system in order to track student performance as well as faculty members who are instructing a particular course or the performance of students over time in a course.In a nutshell, we can observe that the SPMS relational database (a non-human) quite literally plays a vital role in the student performance monitoring system. Additionally, compared to other other processes, this one has the most connections.

The suggested system's six-element analysis is the next step in a sequence of analysis where each analysis builds on the one before it. The table below provides additional insight into the function of each component of the new system based on the detailed picture.

Process	System Role					
	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) Click on the form option. c) Fill up the form with required Information. Admin: a) Admin logs into the system using SPMS User-ID and password. b) Receives the student enrollment		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	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 administrator 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.	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 admin by using it.

	information in the attached files. c)Admin updates the student enrollment information in Database. d) Input the desired time for number of students enrolled.				Excel: a) Data from student accounts may be kept in an excel file and used later in SPMS.	
Student Performance Based on CGPA	Student: a) Log into the System using Student ID and password. b) Input the desired time to view self CGPA Progress. Admin: a) Log into the System using User-ID and password. b) Input the desired time and School, Department or program to view Statistically and analyzed CGPA trend of students. Faculty:		Computer/ Laptop: a) User will need a computer. to access SPMS. Printer b) Used to print out the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a) Used to access the Internet.	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.

	a) Log into the system using Faculty ID and password. b) Input 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 performance based on CGPA	Student: a) Log into the system using Student ID and password. b) Input the course c) View self GPA for the course. Admin: a) Log into the System using User-ID and password. b) Input the desired time Course-ID c) View statistically analyzed GPA trend of Students.		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 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.

	Faculty: a) Log into the System using Faculty ID and password. b) Input the desired time - period Course-ID under the faculty c)view statistically analyzed GPA trend of students who faculty's section.					
Selective Number of Instructorwise student performance based on the GPA	Admin: a) Log into the system using User-ID and password. b) Input the desired time Course-ID c) View statistically analyzed GPA trend of students for a selective number of Instructors . Faculty: a) Log into the system using Faculty ID and password. b) Input the desired time - period & Course-ID		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) 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.

	c)View statistically analyzed GPA trend of students for a selective number of Instructors . GPA trend of students for a selective number of Instructors					
Admin wise student performance	Admin: a) Log into the system using User-ID and password. b) Select Input from VC/Dean/ Department Head c) View the student performance trend as per choice.		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) 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
Instructor wise student performance based on the CGPA of the students	Admin: a) Log into the system using Department-ID and Password.		Computer/ Laptop a) User will need a computer to access SPMS Printer	SPMS a) The software will produce a performance trend.	SPMS Database a) The performance will be stored and updated in	Internet a) To login into and access the SPMS it is used

	b) Input a particular instructor Name/ID c)View the student performance trend of selected Instructor. Faculty: a) Log into the system using User-ID and password. b) Input their Name/ID. c) View the student performance trend.		a) Used to print out the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a) Used to access the Internet		the database	
Total PLO percentage achieved and attempted by the student along with the departmental average	Student: a) Log into the system using Student ID and Password b) Input the time c) Views their comparison of attempted vs achieved PLO percentage along with the departmental average. Admin:		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	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 SPMS it is used

	a) Log into the system using User-ID and Password b) Input the time period c) View the comparison of students attempted PLO vs achieved PLO percentage along with the departmental average. Faculty: a) Log into the system using User-ID and Password. b) Input the time. c) Views the comparison of students attempted PLO vs achieved PLO percentage along with the departmental average		access the Internet			
PLO achievement	Student: a) Log into the system using Student ID and password.		Computer/ Laptop a) User will need a computer to access SPMS	SPMS a) A PLO achievement will be generated by the software.	SPMS Database a) Here, the performance will be stored.	Internet a) To login into and access the SPMS it is used.

	b) Select PLO achievement c) View PLO Achievement. Admin: a) Log into the System using user-ID and password. b) Select PLO achievement c) View PLO Achievement. Faculty: a) Log into the System using Faculty ID and password. b) Select PLO Achievement. c) View PLO achievement.		Printer a) Used to print out the report if need be. Networking Devices (Router, Switch, Bridge, Hub): a) Used to access the Internet			
Expected PLO achievement versus actual score (for courses, students, Departments, programs, or schools)	Student: a) Log into the system using Student ID and password. b) Select PLO achievement comparison c) View PLO achievement Comparison. Admin: a) Log into the system using user-ID and password. b) Select 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):		SPMS Database a) Here, the performance will be stored.	Internet a) To login into and access the SPM it is used

	comparison c) View PLO achievement Comparison. Faculty: a) Log into the System using Faculty ID and password. b) Select PLO achievement comparison. c) view PLO achievement comparison.		a) Used to access the Internet			
CO-PLO achievement summary	Student: a) Log into the system using Student ID and password. b) Select CO - PLO achievement summary. c) View CO- PLO achievement summary. Admin: a) Log into the system using user-ID and password. b) Select CO - PLO achievement summary. c) View CO - PLO		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) 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

	achievement Summary. Faculty: a) Log into the system using Faculty ID and password. b) Select CO - PLO achievement summary. c) View CO - PLO achievement Summary					
Question Bank	Faculty: a) Log into the System using Faculty ID and password. b) Select question bank c)Select course, section and semester and assessment type. d) Upload questions Student: a) Log into the system using Student ID and password. b) Selects Question Bank c) Views form		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) 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

	d) Select course, section, and semester and assessment t type. d)Download questions					
Course Outline	Faculty: a) Log into the System using Faculty ID and password. b) Select Course Outline c)Selects course, section, and semester. d) Upload course outline Student: a) Log into the system using ID and password. b) Select course outline c)Select 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, Bridge, Hub): a) Used to access the Internet	SPMS a) The software will generate course outline	SPMS Database 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)Download course outline.					
Backlog Data	Faculty: a) Log into the System using Faculty ID and password. b) Select backlog data c)Selects course, section, and semester. d) Upload data		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) The software will generate backlog data input	SPMS Database a) The data will be stored and updated in the database	Internet a) To login and access the SPMS it is used

CHAPTER 3 - LOGICAL SYSTEM DESIGN:

In this chapter, we'll go through the steps of building a data model for our hypothetical system so that the data may be stored in a database. The links between various data objects, the rules, and the conceptual representation of the data objects are all included in this data model. Data modeling supports the visual representation of data and applies corporate policies, legal requirements, and governmental directives to the data. The consistency of naming conventions, default values, semantics, and security are all ensured by data models, which also guarantee the accuracy of the data. For a better representation of all the data, we will be constructing our suggested system.

A.Business Rules:

Business rules outline the procedures, concepts, and limitations that control the data model. They are written in standard English language as opposed to the ERD so that a non-technical stakeholder may understand the information about the data model without being familiar with notation. The business rules that govern our data model are as follows:

1. A student can only be an affiliate of one department. StudentID, SName (First and Last Name), Date of Birth, Gender, Email, Phone, Address, and Enrollment Date are all attributes of a student. A department requires a large enrollment of pupils. A student can only sign up for one program.

2. A student can register for multiple events. Grade, SectionID, StudentID, and RegistrationID are all included in a registration. At least one student must complete a registration.

3. A section must have many registrations. A registration has at least one section. A section includes SectionID, Semester, Year, roomNo.

4. A registration may belong to many EVALUATIONS. An evaluation mandatorily belongs to one registration. An evaluation contains EvaluationID, totalMarks, totalMarksObtained, examID.

5. A PLO must contain one program. A program contains one or many PLO's. A program has ProgramID, ProgramName, DepartmentID. A program must contain one or many courses. A Course must fall under one program. A Course have CourseID, CourseName, NumOfCredits, CourseType. A course must have at least one section. The section may get removed if the course gets removed.

6. A program must belong to one department. A department must belong to one or many programs. A department contains DepartmentID, DepartmentName, SchoolID.

7. A department must contain one school. A School must contain one or many departments. A school includes SchoolID, SchoolName.

8. An employee has four sub-type(VC, Dean, Department Head, Faculty). An employee includes employeeID, name(FirstName, LastName).

9. A school must be run by one Dean. A dean must run one school. A Dean has SchoolID, StartDate, EndDate.

10. A Department must be managed by one Department head. A department head must manage one department. A department head includes DepartmentID, StartDate, EndDate.

11. A Faculty must belong to one Department. A department must have one or many Faculties. A Faculty includes DepartmentID, Rank, JoinDate. A faculty may teach many sections. A section must be taught by one faculty.

12. An Exam has examID, grade, examName, sectionNO, studentID. A section has multiple exams.

13. Faculty user will add the course outline and all the users will be able to view it. During the creation of the course outline the user must assign courseOutlineID, contactHours, courseDescription,objective, refermaterials, content, sectionID

14. In the CLO matrix the user must assign all the CLO's along with the CO Description, PLO assessed, CLO – PLO correlation separately. (All the above must be stored in the database)

15. After creation of the course outlines any user will be able to download course outline of a course in a program separately and the user will also be able to download all the course outline of all the courses in a program in a single PDF file

16. In the Lesson Planning with mapping of CLO, teaching and assessment strategies section, every week must be assigned with a topic, Teaching learning strategy, assessment strategy, and the corresponding CLO's of the topic.

17. In EVALUATION_STRATEGY the method of assessment and the assessment form tool to be used, how the distribution of marks will be done and how the distribution of marks will be presented in the course outline are mentioned.

18. In BACKLOG_DATA_TABLE whenever a faculty member will enter an automated backlogID will be generated then the faculty member will insert educationalYear, educationalSemester, timestamp,courseID, obtainedMarks, studentID, facultyID, sectionID. Then with the combination of all this information a new table will be created. Thus faculty members will insert data in the system.
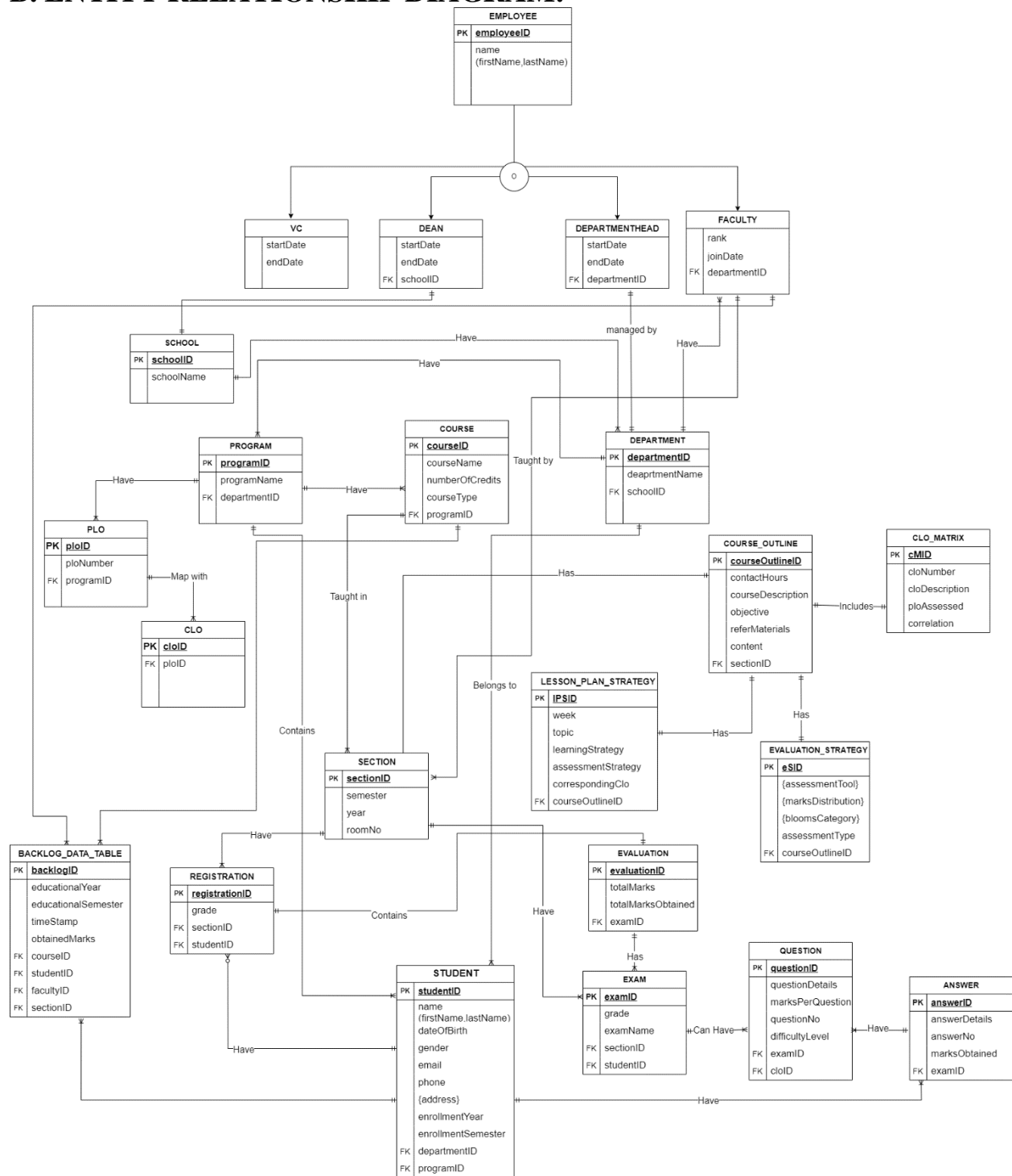
B. ENTITY RELATIONSHIP DIAGRAM:

Figure 3.1: Entity relationship diagram
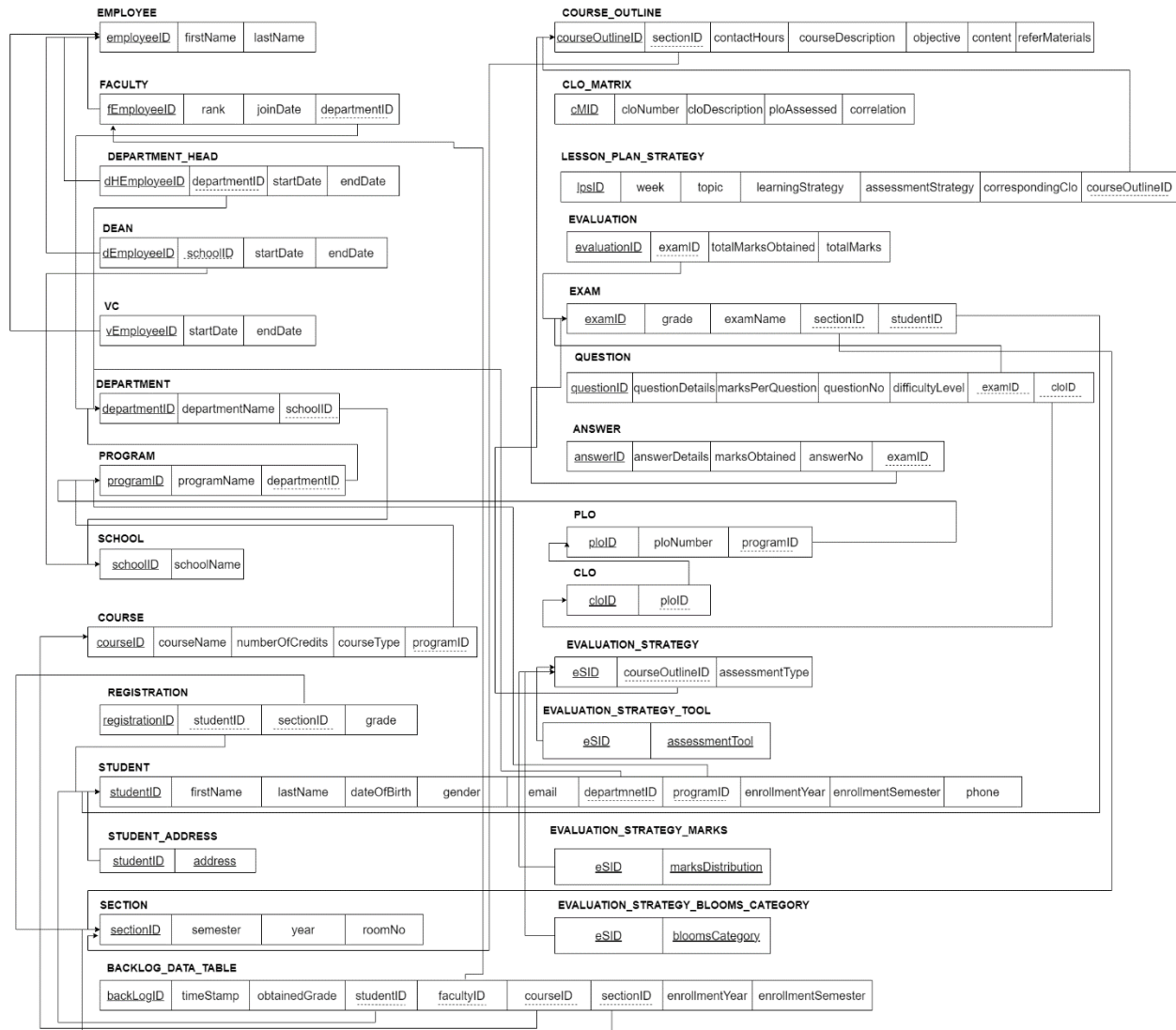
C.ENTITY RELATIONSHIP DIAGRAM TO RELATIONAL SCHEMA

Figure 3.2: Entity relationship diagram

D.NORMALIZATION

Employee(e)	employeeID	e1	Program(p)	programID	p1
	firstName	e2		programName	p2
	lastName	e3		departmentID	d1
VC(v)	startDate	v1	School(h)	schoolID	h1
	endDate	v2		schoolName	h2
Dean(x)	startDate	x1	Department(d)	departmentID	d1
	endDate	x2		departmentName	d2
	schoolID	h1		schoolID	h1
Department_Head (y)	startDate	y1	Section(n)	sectionID	n1
				semester	n2
	endDate	y2			
				year	n3
	departmentID	d1		roomNo	n4
Faculty(f)	joinDate	f1	Registration(r)	registrationID	r1
				grade	r2
	rank	f2			
				sectionID	h1
	departmentId	d1		studentID	s1
Course(c)	courseID	c1	Clo_Matrix(m)	cMID	m1
	courseName	c2		cloNumber	m2
	numberOfCredits	c3		cloDescription	m3
	courseType	c4		ploAssessed	m4
	programID	p1		correlation	m5
Course_Outline(o)	courseOutlineID	o1	Lesson_Plan_Strategy (t)	lPSID	t1
	contactHours	o2		week	t2
	courseDescription	o3		topic	t3
	Objective	o4		learningStrategy	t4
	referMaterials	o5		assessmentStrategy	t5
	content	o6		correspondingClo	t6
	sectionID	n1		courseOutlineID	o1

Student(s)	studentID	s1	**Backlog_Data _Table(k)**	backlogID	k1
	firstName	s2		timeStamp	k2
	lastName	s3		obtainedGrade	k3
	dateOfBirth	s4		sectionID	n1
	gender	s5		educationalYear	k4
	email	s6		educationalSemester	k5
	phone	s7		studentID	s1
	address	s8		facultyID	f1
	enrollmentYear	s9		courseID	c1
	enrollmentSemester	s10			
	departmentID	d1			
	programID	p1			
Evaluation(g)	evaluationID	g1	**Evaluation_Strategy (u)**	eSID	u1
	totalMarks	g2		assessmentTool	u2
	totalMarksObtained	g3		marksDescription	u3
	examID	i1		bloomsCategory	u4
				courseOutlineID	o1
PLO(w)	ploID	w1	**CLO(b)**	cloID	b1
	ploNumber	w2		ploID	w1
	programID	p1			
Exam(i)	examID	i1	**Answer(a)**	answerID	a1
	examName	i2		answerDetails	a2
	grade	i3		AnswerNo	a3
	sectionID	n1		marksObtained	a4
	studentID	s1		examID	i1

Question(q)	questionID	q1	
	questionDetails	q2	
	marksPerQuestion	q3	
	questionNo	q4	
	DifficultyLevel	q5	
	examID	i1	
	cloID	b1	

1NF:

1) There are no repeating groups

2) There is at least one primary key

e1	e2	e3	v1	v2	x1	x2	y1	y2	f1	f2	c1
c2	c3	c4	o1	o2	o3	o4	o5	o6	p1	p2	h1
h2	d1	d2	n1	n2	n3	n4	r1	r2	m1	m2	m3
m4	m5	t1	t2	t3	t4	t5	t6	k1	k2	k3	k4
k5	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	g1
g2	w1	w2	i1	i2	i3	u1	u2	u3	u4	b1	a1
a2	a3	a4	q1	q2	q3	q4	q5				

2NF:

1)Partial dependency has been removed

3NF:

1)Has no transitive dependencies
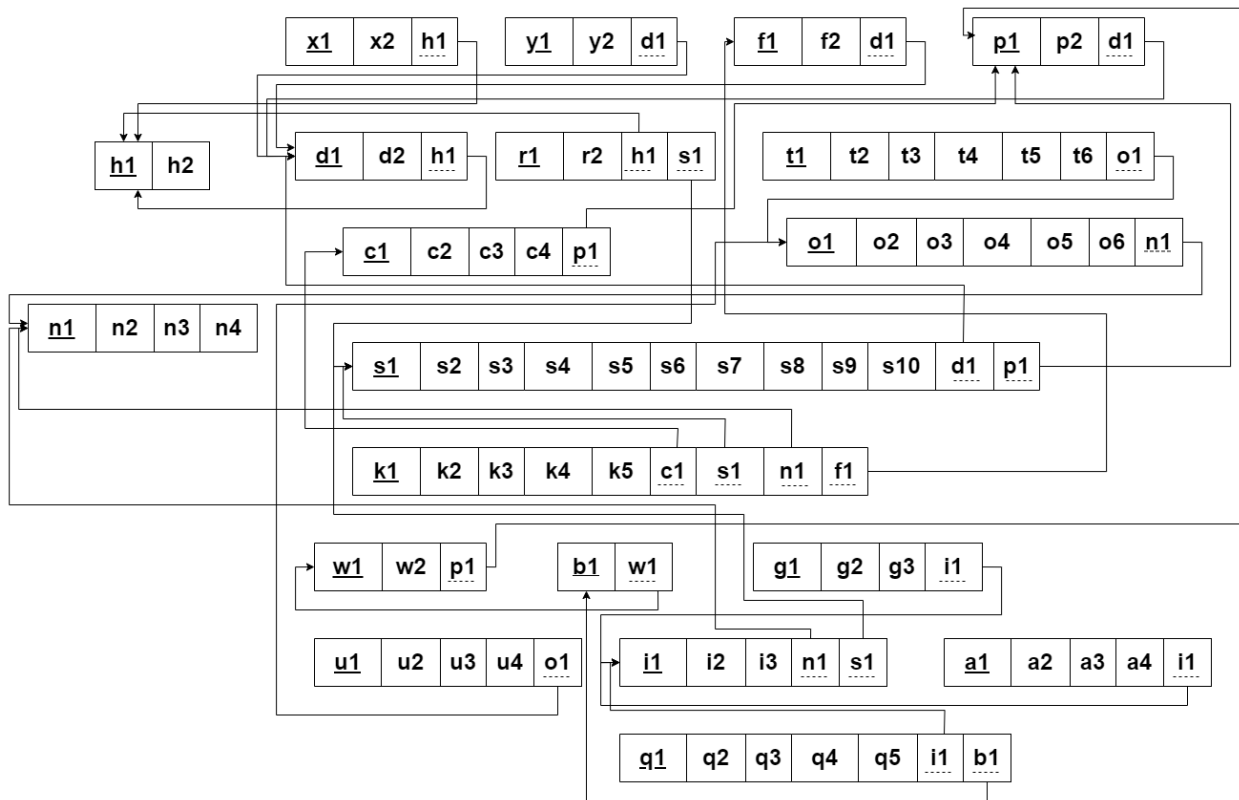
Already in BCNF Form as there is no determinant that is not a unique identifier.

E. DATA DICTIONARY:

Program_T

Name	Data Type	Size	Remarks
programID	INTEGER	11	This is the primary key for a program. E.g: "1"
programName	VARCHAR	50	This is the name of the program. E.g: "Bachelor of Science"
departmentID	VARCHAR	3	This is the foreign key from the Department table.

Department_T

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

School_T

Name	Data Type	Size	Remarks
schoolID	VARCHAR	5	This is the primary key for the E.g: "CSE"
schoolName	VARCHAR	50	This is the name of the school. E.g: "Computer Science and Engineering".

Registration_T

Name	Data Type	Size	Remarks
registrationID	INTEGER	11	This is the Primary Key for Registration. E.g: "0101010101"
studentID	INTEGER	11	This is the foreign key from student table
sectionID	INTEGER	11	This is the foreign key from section table

Student_T

Name	Data Type	Size	Remarks
studentID	INTEGER	11	This is the primary key for the Student table. E.g: "1830707".
firstName	VARCHAR	30	This is the first name of the student. E.g: "Md Akram".
lastName	VARCHAR	30	This is the last name of the student. E.g: "Hossain".
dateOfBirth	DATE	DD-MM-YYYY	This is the birth date of the student. E.g: "31-12-1998".
gender	VARCHAR	6	This is the gender of the student. E.g: "Male".
email	VARCHAR	30	This is the email of the student. E.g: "1830707@iub.edu.bd"
phone	NUMERIC	11	This is the phone of the student. E.g: "01XXXXXXXXX".
address	VARCHAR	50	This is the address of the student. E.g: "House 238,Road 8,Tejgaon,Dhaka

departmentID	VARCHAR	3	This is the foreign key from the Department table. E.g: "CSE"
programID	INTEGER	11	This is the foreign key from the Program table. E.g: "1"
enrollmentYear	VARCHAR	10	This is enrollment year of the student.
enrollmentSemester	VARCHAR	4	This is the enrollment semester of the student

CLO_T

Name	Data Type	Size	Remarks
cloID	VARCHAR	5	This is the primary key for the CO table. E.g: "CO1".
ploID	VARCHAR	5	This is the foreign key from the PLO table. E.g: "PLO1"

PLO_T

Name	Data Type	Size	Remarks
ploID	VARCHAR	5	This is the primary key for Program Learning Outcome. E.g: "PLO1"
ploNum	INTEGER		This is the PLO number. E.g: "1"
programID	INTEGER		This is a foreign key from the Program table. E.g: "1"

Employee_T

Name	Date Type	Size	Remarks
employeeID	INTEGER		This is the primary key for Employee table. E.g: "1001"
firstName	VARCHAR	20	This is the first name of the faculty. E.g: "Sadita"
lastName	VARCHAR	20	This is the last name of the faculty. E.g: "Ahmed"

VC_T

Name	Data Type	Size	Remarks
startDate	DATE	dd-mm-yyyy	This is the starting date. E.g: "01-03-2020"
endDate	DATE	dd-mm-yyyy	This is the date DEAN retire from his post. E.g: "01-03-2024"

Dean_T

Name	Data Type	Size	Remarks
schoolID	VARCHAR	5	This is the SchoolID of the school DEAN manages. E.g: "SETS"
startDate	DATE	dd-mm-yyyy	This is the starting date. E.g: "01-03-2020"
endDate	DATE	dd-mm-yyyy	This is the date DEAN retire from his post. E.g: "01-03-2024"

DepartmentHead_T

Name	Data Type	Size	Remarks
departmentID	VARCHAR	3	This is the DepartmentID of the department HEAD manages.E.g: "CSE"
startDate	DATE	dd-mm-yyyy	This is the starting date. E.g: "01-03-2020"
endDate	DATE	dd-mm-yyyy	This is the date HEAD retire from his post. E.g: "01-03-2024"

Faculty_T

Name	Data Type	Size	Remarks
departmentID	VARCHAR	5	This is the foreign key for this table
joinDate	DATE	dd-mm-yyyy	This is the starting date. E.g: "01-03-2020"
rank	VARCHAR	20	This is the rank of the faculty. E.g: "Assistant Professor"

Evaluation_T

Name	Data Type	Size	Remarks
evaluationID	INTEGER	11	This is the primary key for this table
totalMarks	VARCHAR	11	This is the total marks of specific exam
totalMarksObtained	VARCHAR	11	This is the total marks achieved by the student in a specific exam
examID	VARCHAR	20	This is the foreign key from exam table

Evaluation_Strategy_T

Name	Data Type	Size	Remarks
eSID	INTEGER	11	This is the primary key for this table
courseOutlineID	INTEGER	11	This is the foreign key for this table

AssessmentTool_T

Name	Data Type	Size	Remarks
asID	INTEGER	11	This is the primary key for this table
eSID	INTEGER	11	This is the foreign key for this table

Marks-Distribution_T

Name	Data Type	Size	Remarks
asID	INTEGER	11	This is the primary key for this table
eSID	INTEGER	11	This is the foreign key for this table

Blooms_Category_T

Name	Data Type	Size	Remarks
bcID	INTEGER	11	This is the primary key for this table
eSID	INTEGER	11	This is the foreign key for this table

Exam_T

Name	Data Type	Size	Remarks
examID	INTEGER	11	This is the primary key from the Exam table. E.g: "1233"
grade	VARCHAR	15	This is the percentage range for assessment.
examName	VARCHAR	30	This is the name of the exam
sectionID	INTEGER	11	This is the foreign key from section table
studentID	INTEGER	11	This is the foreign key from student table

Question_T

Name	Data Type	Size	Remarks
questionID	INTEGER	11	This is the primary key for this table.
questionDetails	MEDIUMTEXT	15	This is the question details.
marksPerQuestion	VARCHAR	30	This is the mark of each question
difficultyLevel	INTEGER	11	This is the difficulty level of the questions
examID	INTEGER	20	This is the foreign key from exam table
cloID	INTEGER	11	This is the foreign key from clo table

Answer_T

Name	Data Type	Size	Remarks
answerID	INTEGER	11	This is the primary key for this table.
answerDetails	MEDIUMTEXT		This is the answer details.
answerNO	INTEGER	11	This is the number of each question
marksObtained	INTEGER	11	This is the mark obtained by the student for each answer
examID	INTEGER	20	This is the foreign key from exam table

Course_T

Name	Data Type	Size	Remarks
courseID	INTEGER	6	This is the primary key from the Course table.
courseName	VARCHAR	40	This is the name of the Course.
numberOfCredits	INTEGER	11	This is the number of credits for the Course. E.g: "3"
courseType	VARCHAR	10	This is the type of the Course. E.g: "Core"
programID	INTEGER	11	This is the foreign key from the program table. E.g: "1"

CourseOutline_T

Name	Data Type	Size	Remarks
courseOutlineID	INTEGER	11	This is the primary key from the Course Outline table. E.g: "1233"
contactHours	VARCHAR	11	This is the contact hpurs of the course
courseDescription	MEDIUMTEXT		This is the description of the course
objective	MEDIUMTEXT		This is the objective of the course
referMaterials	MEDIUMTEXT		This is the reference material of the course
content	MEDIUMTEXT		This is the content of the course
sectionID	INTEGER	11	This is the foreign key from the section table

Clo_Matrix_T

Name	Data Type	Size	Remarks
cMID	INTEGER	11	This is the primary key for this table.
cloNumber	INTEGER	11	This is the clo number
cloDescription	MEDIUMTEXT		This is the clo description
correlation	INTEGER	11	This is the correlation value or number
ploAssessed	VARCHAR	10	This is the plo assessed

Lesson_Plan_Strategy_T

Name	Data Type	Size	Remarks
lPSID	INTEGER	11	This is the primary key for this table.
week	INTEGER	11	This is the week number
topic	MEDIUMTEXT		This is the topic name
learningStrategy	MEDIUMTEXT	11	This is the lesson plan strategy of that topic
correspondingClo	VARCHAR	10	This is the correspondingclo of that topic

Backlog_Data_T

Name	Data Type	Size	Remarks
backlogID	INTEGER	11	This is the primary key for this table.
educationalYear	VARCHAR	11	This is the educational year
educationalSemester	VARCHAR		This is the educational semester
timeStamp	INTEGER	11	This is the time stamp
courseID	INTEGER	10	This is the foreign key from course table
studentID	INTEGER	10	This is the foreign key from student table
facultyID	INTEGER	10	This is the foreign key from faculty table
sectionID	INTEGER	10	This is the foreign key from section table

CHAPTER 4 - PHYSICAL SYSTEM DESIGN:

```php
<?php
  include 'connect.php';
  session_start();
?>

<!doctype html>
<html lang="en">
  <head>
    <!-- Required meta tags -->
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">

    <!-- Bootstrap CSS -->
    <link rel="stylesheet" href="https://cdn.jsdelivr.net/npm/bootstrap@4.4.1/dist/css/bootstrap.min.css" integrity="sha384-Vkoo8x4CGsO3+Hhxv8T/Q5PaXtkKtu6ug

    <title>Employee Dashboard</title>
    <!--Google Font-->
    <link href="https://fonts.googleapis.com/css2?family=Poppins:wght@400;600&display=swap" rel="stylesheet">

    <link rel="stylesheet" href="style.css">

    <script type="text/javascript" src="https://www.gstatic.com/charts/loader.js"></script>
    <script type="text/javascript"></script>


    <style>
        body{
            background-color:#155977;
        }

        ::placeholder{
          color:white;
        }
```

```
::-ms-input-placeholder{
          color:white;
        }

        :-ms-input-placeholder{
          color:white;
        }

    </style>

  </head>

  <body>
    <!--
    <div class="container" id="logoutbutton">
    <a href="logout.php" class="btn btn-primary mb-5">Logout</a>
    </div>
    -->

    <div class="nav">
        <input type="checkbox" id="nav-check">
        <div class="nav-header">
          <div class="nav-title">

          </div>
        </div>
        <div class="nav-btn">
          <label for="nav-check">
            <span></span>
            <span></span>
            <span></span>
          </label>
        </div>
```

Grade Wise CLO ANALYSIS


```php
//Getting backlogID
$result = mysqli_query($con,
"SELECT MAX(backlogID) AS backlogID
FROM backlog_data_t");
$row=mysqli_fetch_assoc($result);
$backlogID=$row['backlogID'];

$sectionQuery="INSERT INTO section_t (sectionNum, semester, courseID, facultyID, year) VALUES
('$section', '$semester', '$courseID','$facultyID', '$year')";
$sectionTable = mysqli_query($con, $sectionQuery);

//Getting sectionID
$result = mysqli_query($con,
"SELECT MAX(sectionID) AS secID
FROM section_t");
$row=mysqli_fetch_assoc($result);
$secID=$row['secID'];


$registrationQuery="INSERT INTO registration_t (sectionID, studentID) VALUES
('$secID', '$studentID')";
$registrationTable = mysqli_query($con, $registrationQuery);

$examName="Backlog";
$examQuery="INSERT INTO exam_t (sectionID, examName) VALUES
('$secID', 'Backlog')";
$examTable = mysqli_query($con, $examQuery);

//Getting registrationID
$result = mysqli_query($con,
"SELECT MAX(registrationID) AS regID
FROM registration_t");
$row=mysqli_fetch_assoc($result);
$regID=$row['regID'];
```

```php
//student course performance
$gradePoint=0;
if( $marks >= 90 && $marks<=100)
    $gradePoint=4.0;
elseif( $marks>= 85 && $marks<=89)
    $gradePoint=3.7;
elseif($marks >= 80 && $marks<=84)
    $gradePoint=3.3;
elseif( $marks >= 75 && $marks<=79)
    $gradePoint=3.0;
elseif( $marks >= 70 && $marks <=74)
    $gradePoint=2.7;
elseif( $marks >= 60 && $marks <=69)
    $gradePoint=2.3;
elseif( $marks >= 65 && $marks <=64)
    $gradePoint=2.0;
elseif( $marks >= 55 && $marks <=59)
    $gradePoint=1.7;
elseif( $marks >= 50 && $marks <=54)
    $gradePoint=1.3;
elseif( $marks >= 45 && $marks<=49)
    $gradePoint=1.0;
elseif( $marks < 44 )
    $gradePoint=0.0;
$studCoursePerformanceQuery = "INSERT INTO student_course_performance_t(registrationID, totalMarksObtained,gradePoint)
VALUES ('$regID', '$marks', '$gradePoint')";
$studCoursePerformanceTable = mysqli_query($con, $studCoursePerformanceQuery);
```

```php
//Getting examID
$result = mysqli_query($con,
"SELECT MAX(examID) AS examID
FROM exam_t");
$row=mysqli_fetch_assoc($result);
$examID=$row['examID'];


$ansMark = $marks/10;
$answerQuery="INSERT INTO answer_t (answerDetails, answerNum, markObtained,
registrationID,questionID, examID) VALUES
('Backlog', 1, '$ansMark', '$regID', 0, '$examID'),
('Backlog', 2, '$ansMark', '$regID', 0, '$examID'),
('Backlog', 3, '$ansMark', '$regID', 0, '$examID'),
('Backlog', 4, '$ansMark', '$regID', 0, '$examID')";
$answerTable = mysqli_query($con, $answerQuery);

$questionQuery="INSERT INTO question_t (questionDetails, markPerQuestion, questionNum,
difficultyLevel, examID, courseID, coNum) VALUES
('Backlog', 10, 1, FLOOR(RAND()* (5-1+1))+1, '$examID', '$courseID', 1),
('Backlog', 10, 2, FLOOR(RAND()* (5-1+1))+1, '$examID', '$courseID', 2),
('Backlog', 10, 3, FLOOR(RAND()* (5-1+1))+1, '$examID', '$courseID', 3),
('Backlog', 10, 4, FLOOR(RAND()* (5-1+1))+1, '$examID', '$courseID', 4)";
$questionTable = mysqli_query($con, $questionQuery);

//PO Table
$programID=0;
if($courseID=="CSE101"){
    $programID=13;}
elseif($courseID=="EEE131"){
    $programID=20;}
elseif($courseID=="ENG101"){
    $programID=9; }
```

```php
$poQuery= INSERT INTO po_t (poNum, programID) VALUES
(FLOOR(RAND()* (12-1+1))+1, '$programID'),
(FLOOR(RAND()* (12-1+1))+1, '$programID'),
(FLOOR(RAND()* (12-1+1))+1, '$programID'),
(FLOOR(RAND()* (12-1+1))+1, '$programID')";
$poTable = mysqli_query($con, $poQuery);

//Getting po/ploID
$result = mysqli_query($con,
"SELECT MAX(poID) AS poID
FROM po_t");
$row=mysqli_fetch_assoc($result);
$poID=$row['poID'];

//PLO Table :)
$minPLO =$poID-3;
$ploQuery="INSERT INTO plo_t (ploNum, programID)
SELECT poNum, programID
FROM po_t
Where poID Between '$minPLO' AND '$poID'";
$ploTable = mysqli_query($con, $ploQuery);
$ploID=$poID;


//CO Table
$coQuery="INSERT INTO co_t (coNum, courseID, ploID, poID) VALUES
(1, '$courseID', '$ploID', '$poID'),
(2, '$courseID', '$ploID', '$poID'),
(3, '$courseID', '$ploID', '$poID'),
(4, '$courseID', '$ploID', '$poID')";
$coTable = mysqli_query($con, $coQuery);
```

```php
    // $backlogSectionTable = mysqli_query($con, $backlogSectionQuery);
}
?>
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>



    <script type="text/javascript" src="https://www.gstatic.com/charts/loader.js"></script>
<script type="text/javascript">
    google.charts.load("current", {packages:['corechart']});
    google.charts.setOnLoadCallback(drawChart);
    function drawChart() {


      var data = google.visualization.arrayToDataTable([
        ["CLO NUMBER", "percentage", { role: "style" } ],
        ["CO1", <?php echo $inputedMark; ?>, "green"],
        ["CO2", <?php echo $inputedMark; ?>, "red"],
        ["CO3", <?php echo $inputedMark; ?>, "blue"],
        ["CO4", <?php echo $inputedMark; ?>, "yellow"]
      ]);
```

```
203
204            var view = new google.visualization.DataView(data);
205            view.setColumns([0, 1,
206                             { calc: "stringify",
207                               sourceColumn: 1,
208                               type: "string",
209                               role: "annotation" },
210                             2]);
211
212          var options = {
213            title: "Grade Wise CLO ANALYSIS ",
214            width: 1500,
215            height: 800,
216            bar: {groupWidth: "80%"},
217            legend: { position: "none" },
218          };
219          var chart = new google.visualization.ColumnChart(document.getElementById("columnchart_values"));
220          chart.draw(view, options);
221        }
222      </script>
223    </head>
224    <body>
225        <div id="columnchart_values" style="width: 900px; height: 300px;"></div>
226    </body>
227    </html>
```

CHAPTER 5 - CONCLUSION:

A. PROBLEM AND SOLUTION:

Analysis Phase

Because there was no discrete data available, the majority of the work was depend on assumptions and questions were established when working on the rich picture and six element analysis of the organization's operations. There were misunderstandings, respected faculty members, and stakeholder interviews conducted.

Designing Phase

The Relational Schema design also included the retention of created entities at their Significant levels based on descriptive study. The instructor's feedback was also highly important and valid in this situation.

Implementation Phase

All the Software System Requirements (SSR's) reached successfully
Front-End Development tools: HTML, CSS, Bootstrap JavaScript
Back End Development tools: PHP, XAMPP
Database-integration: MYSQL

ADDITIONAL FEATURE AND FUTURE DEVELOPMENT:

We can add a feature where system can provide learning resources,practice exercise,study material to improve their performance also they can give mock exam to see their progress.

REFERENCES-

[1] Independent University - Bangladesh, "Curriculum for B Sc. in Computer Science and Engineering (Version 2.2)," Independent University - Bangladesh, March 19, 2017.
[2] Independent University - Bangladesh, "www.iub.edu.bd," 2020. [Online]. Available: www.iub.edu.bd.