Independent University, Bangladesh

Project Draft Report

Course Title: Database Management

Course Code: CSE 303

Section: 04

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STUDENT ENROLLMENT AND REVENUE ANALYSIS

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CHAPTER 1

INTRODUCTION

A: BACKGROUND OF THE ORGANIZATION:

Independent University, Bangladesh(IUB) is one of the first private universities of Bangladesh. It was established in 1993. Currently around 8,423 students are enrolled in IUB. Moreover, IUB currently has 13,745 alumni and 401 faculty members who are contributing to outstanding research in a variety of fields. IUB conducts its academics through various Schools. Currently, IUB has 5 Schools:

1. School of Entrepreneurship and Business.
2. School of Engineering, Technology and Sciences.
3. School of Environment and Life Sciences.
4. School of Liberal Arts and Social Sciences.
5. School of Pharmacy and Public Health.

Under each School, there are several departments. Currently, IUB has a total of 12 departments. As per the world university rankings of Times Higher Education (THE) IUB stands within 400th universities globally in terms of various aspects of impact analysis. Moreover, IUB provides various types of scholarships to encourage the students in academics. With the help of well-equipped laboratories as well as an enormous library, students and researchers get to invest their knowledge efficiently.

B: BACKGROUND OF THE PROJECT:

This project is used to analyze the enrollment process of a specific organization.This project focuses on decreasing the manual labor for tasks. Moreover, various kinds of users for an organization like IUB can use the software to view information. Both the enrollment data and revenue information are stored in the database. In addition, detailed data of all the courses for each department is added including credit hour, course ID, currently enrolled students, etc. The data stored can be used to generate various charts and tables in order to view the information required. In the enrollment process we can see the information of course's course name, course ID, course section, maximum capacity, enrolled capacity, class time and days. There is information available such as faculty name, faculty ID, classroom number, school name and others. The project works by taking an input from the user through which it can generate charts/tables that the user wants to view.

C: OBJECTIVES OF THE PROJECT:

The objective of our project is to perform some of the significant tasks that need to be done repeatedly. With the help of this project, the time consuming tasks that are done manually are done within a short span of time. The basic functions of this project are:

- Store the enrollment information of students of each Semester for each School and Department.
- Analyze the revenue of each School for selected Semesters as well to view the percentage change in revenue for each School from a specific semester to another.
- Generate the classroom requirement for each day for a specific number of slots.
- Analyze the resources of IUB by observing the amount of unused resources.

With the help of this software, the human interference in these vital tasks are reduced and hence, the results are more precise as it has less chance of errors. Moreover, by automating the tasks, the time can be utilized elsewhere. In addition, data can be accessed easily.

Although building a software like this might seem expensive but on a larger scale considering doing the same tasks manually, it is more efficient and less costly to go for automated processes.

D: SCOPE OF THE PROJECT:

This project is giving out solutions to enrollment issues and revenue changes. This project is helping students, faculty, department managers and others to use this web app for data:

- storing
- editing
- adding
- updating
- viewing

We designed possible users for the web-based system for the users and imagined how they would use it, as well as the information and data they would require.

We will create customized user interfaces and login capabilities for all participants who will be users of this system, because problems might develop at any stage in any business process.

We use this system for data storage, so obtaining relevant files, tabular data, formats, and reports is really simple, and we can interact with the data in real time.

We also build user interfaces that allow all users to quickly access data and generate and download reports.

CHAPTER 2

REQUIREMENT ANALYSIS

A: RICH PICTURE OF EXISTING BUSINESS SYSTEM

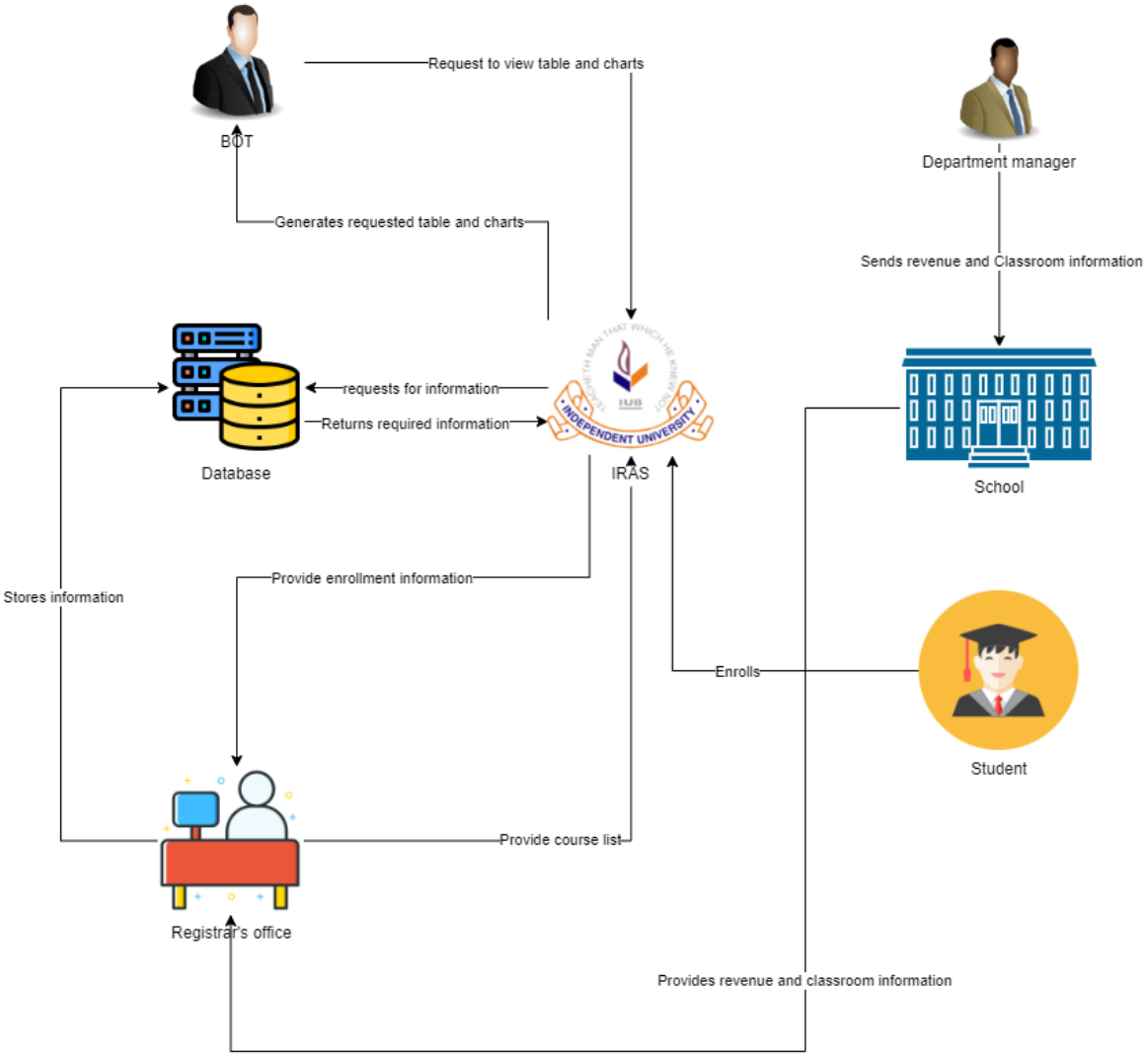

Figure 1: Rich picture (AS-IS)

B: EXISTING SIX SYSTEM ELEMENTS

Process	System Roles					
	Human	**Non-Comp Hardware**	**Computing Hardware**	**Software**	**Database**	**Network & communication**

Generate revenue table and chart for each School	**Board of Trustees:** 1.Login to iras 2.Request to view revenue table and chart. 3. Select a school to generate revenue 4. Select a semester for which they want to view the revenue.	**Paper:** Used to print the chart and table	**Compute r:** 1.Used to login to iras 2. Board of trustees use computers to view table and charts from the school he wants to view it for Printer: 1. To print out the chart and data from the table	**Iras:** 1. Board of trustees use iras to download the tables and chart in excel file Microsoft Excel: 1. Excel Sheet is used by Board of trustees to read the table data	**Database :** 1. IRAS uses a Database server to generate the table and chart.	**Internet:** 1. The Internet is used to Communi cate with IRAS to browse the software/ webpage where the board of trustees can generate revenue.
Prepare tally sheets	**Registrar's Office:** 1.Login to iras 2.Download enrollment information provided by the system(iras) 3.Make a tally sheet from the downloaded enrollment information. 4.Input the enrollment information	**Paper:** Used to print the tally sheets in order to store the hardcopy	**Compute r:** 1.Used to login to iRAS 2. Used to download the enrollment file 3.Used to make another excel file 4.Used to upload the excel file for each departmen	**Microsof t Excel:** Used to make the tally sheet **iRAS:** used to download the enrollme nt informati on.	**Database :** used to store all the tally sheets for every semester	**Internet:** 1.Used to login to iRAS 2.Used to upload the tally sheet into database

	for each School separately 5. Store the data into the database		t into the system which is the tally sheet Printer: Prints the hardcopy of the tally sheet			
Prepare classroom requirement summary as per class size	**Department manager:** 1.Count the number of classrooms. 2. Count the number of seats available. 3. Sends data to the respective school **School:** 1. Receives the data from each department manager. 2. Merge the data from all the departments. 3. Calculates the number of sections required and per availability .	**Pen and paper:** 1. Used for keeping the hardcopy of manually counted data.	**Computer:** 1. Used for making a spreadsheet of the data. 2. Email the spreadsheet to the Registrar's office. Printer: 1. To keep a hard copy if any data is misplaced.	**Excel:** 1. Used to make the soft copy of the data 2. Used to make the tally sheet. **E-mail:** To send an email to the Registrar's office.	**Personal computer:** To store the spreadsheet.	**Internet:** 1. To send email.

	4. Assign faculty members for each section. 5. Send them to the Registrar's office. **Registrar's office:** 1. Receives the merge list of each school. 2. Make a tally sheet. 3. Store it in the database.					
Analysis of unused resources for each School	**School:** 1. Provides a detailed list of resources unused. Registrar's office : Receives the information of unused resources from each School Makes an excel sheet to store the information for each School Store the sheet into the database	**Paper:** 1. Used to print the analysis for keeping hardcopy	**Computer:** 1. Used to give excel files to the register office. 2.Used to login to iras. 3. Used for input all unused resources information. **Printer:** 1.To print the analysis.	**Excel:** 1.Excel Sheet is used by registrar office so that it can input data in database **iRAS:** 1.Used to store the information provided by the registrar's office. 2. Used to give	**Database:** 1.Stores information of unused resources. 2.Generats the analysis as per the input of the Board of Trustees.	**Internet:** 1.Used for login in iRas. 2.Used to upload the information into the database. 3.Used to access database.

	Board of Trustees: 1.Login to iras 2. Provide the number of students to navigate which sections has less than that number of students enrolled for each School 3. View the information as well as the total number of sections of that has less than that number of students enrolled for each School.			input of the number of students.		
Generate percentage change in revenue for each School	**Board of Trustees:** 1. Login to RAS 2. Requests to generate the percentage change in revenue for the desired School 3. Print the generated chart if needed.	**Paper:** Used to print the generated chart to keep it as a hardcopy.	**Computer:** 1.Used to login to iRAS 2. Used to download the generated report for a specific School **Printer:** Used to print the	**iRAS:** 1. Used to login 2.Used to generate the percentage change in revenue.	**Database:** Contains the revenue information for each semester	**Internet:** Used to login to iRAS and download the report

			report on a paper.			
Store the number of sections offered in SETS departme nt	**Department Manager:** 1. Logs into iRAS 2. Set the number of sections for each course 3. Send the data to respective School **School:** 1. Receives the number of sections needed for each course 2. Sends it to Registrar's office **Registrar's office:** 1. Receives the information regarding each course Makes a spreadsheet 2. Sends to database to store information.	**Paper:** 1.It is used to keep the hardcopy of the number of sections offered in each course in the SETS departme nt.	**Compute r:** 1.It is used to log in to iRAS 2.It is used to make a spreadshe et 3.It is used to make sections and upload it into the database.	**iRAS:** 1.It is used to log in 2.It is used to upload/u pdate informati on 3.The number of sections offered are viewed here. **Microsof t Excel:** 1.It is used to make a spreadshe et. **Email:** 1.It is used to sent the informati on.	**Database :** 1.Stores the informati on 2.Sends the informati on to iRAS.	**Internet:** 1.It is used to login to iRAS 2.It is used to upload informatio n in iRAS or use the webpage 3.It is used to upload the informatio n in database
Analysis of number of sections	**Board of Trustees:** 1. Login in IRAS	**Paper:** 1.Used to print hardcopy	**Compute r:**	**Iras:** 1.Registr ar's office use iras to	**Database :**	**Internet:** 1.Used to login to iRAS

for each semester	2. Request for the list of sections for a particular course. 3. Requests "n" numbers and shows the sections which have students less than "n". **Registrar's office:** 1. Downloads the enrollment data from the iras. 2. Stores the enrollment data in the database.	of the analysis	1.Used to login to iRAS 2. Board of trustees use computers to see a list of section that has less than the number he gave he input 3. Register office use computer to provide the required information **Printer:** 1.Used to print out the report if need be.	download the enrollment data from the iras **Microsoft Excel:** 1.View the downloaded Excel Sheet	1.Used to fetch data.	2.To access iras and databases.

C: BUSINESS PROCESS DIAGRAM (AS-IS)

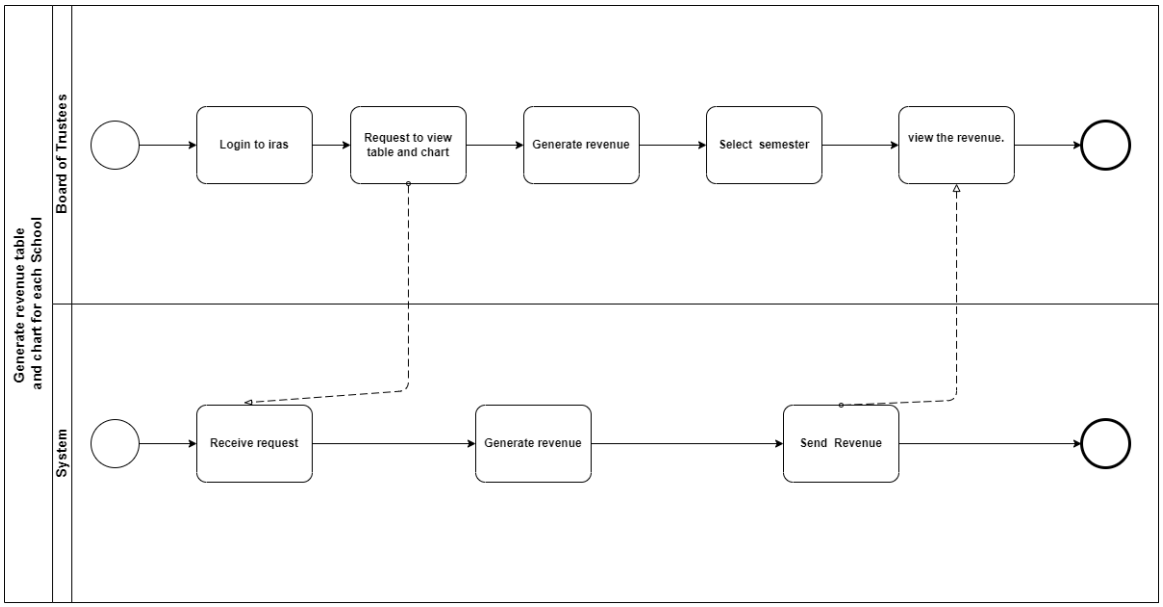

Figure 2: Generate revenue table and chart for each school

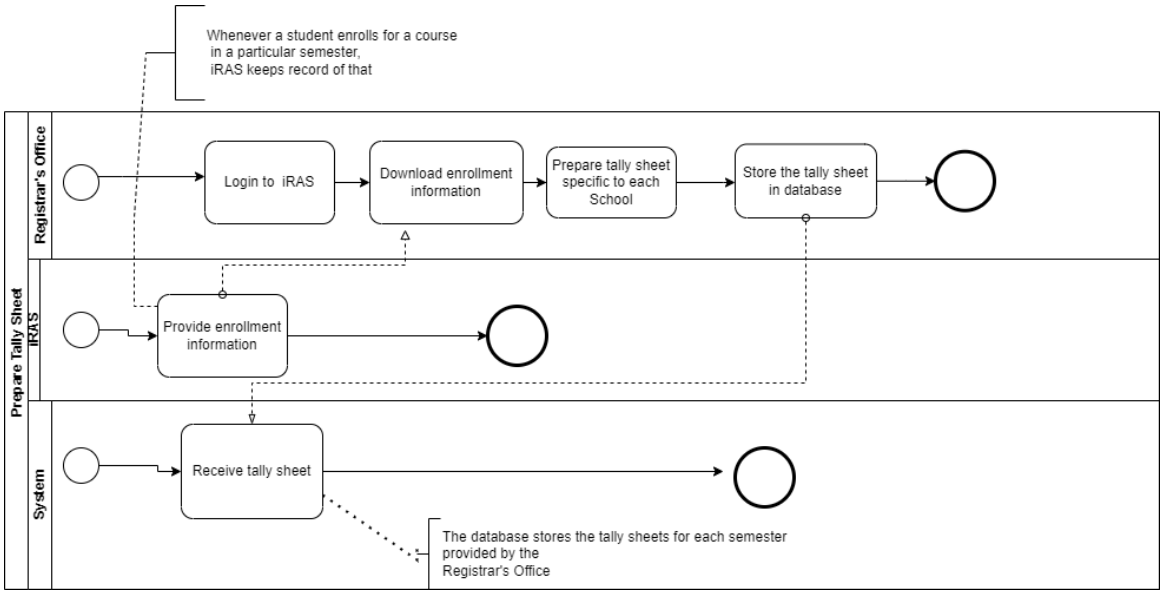

Figure 3: Prepare Tally Sheet

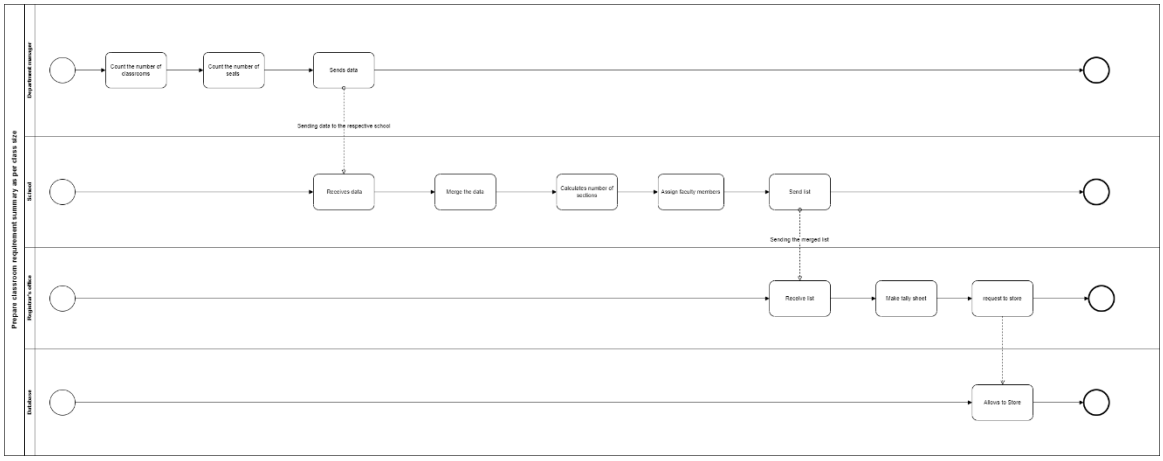

Figure 4: Prepare classroom requirement summary as per class size

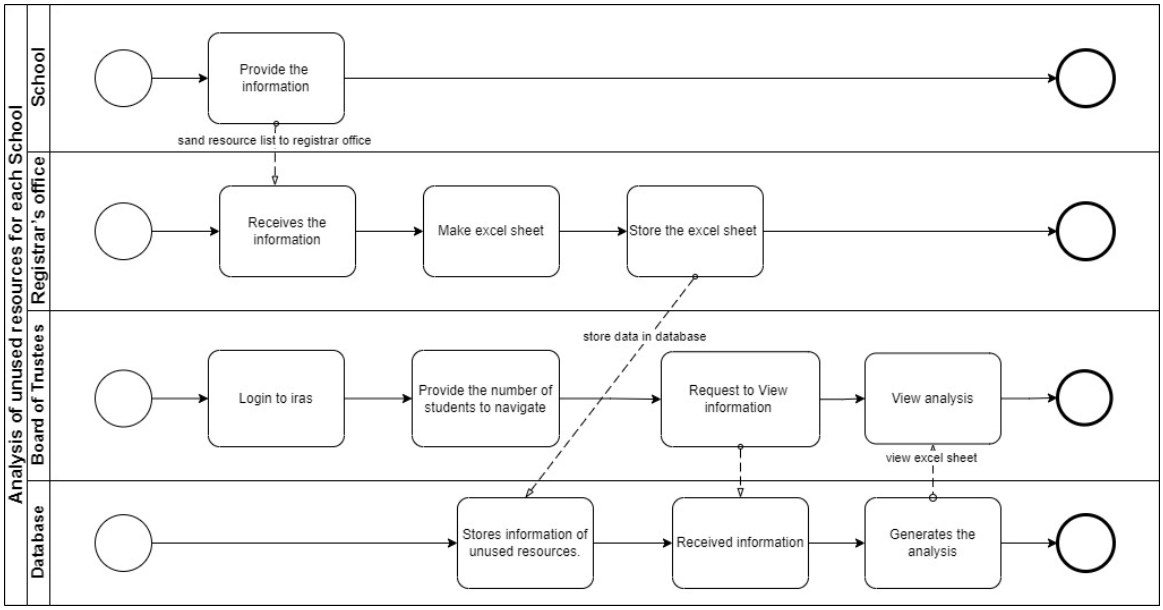

Figure 5: Analysis of unused resources for each school

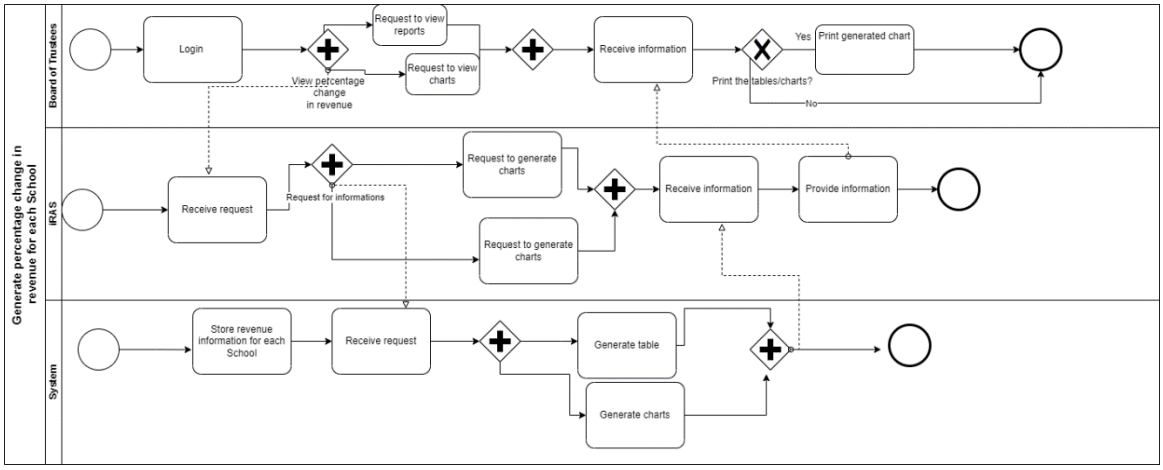

Figure 6: Generate Percentage Change in Revenue for each School

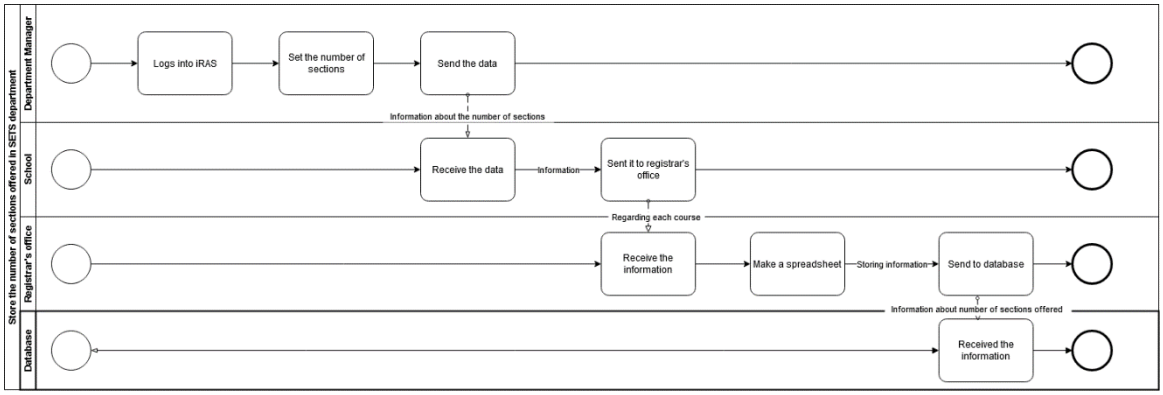

Figure 7: Store the number of section offered in SETS department

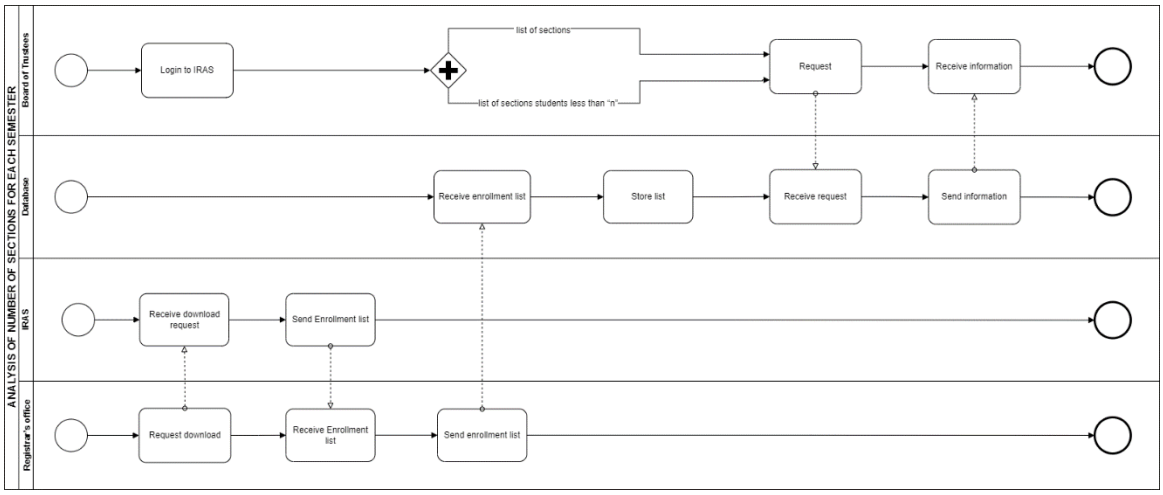

Figure 8: ANALYSIS OF NUMBER OF SECTIONS FOR EACH SEMESTER

CHAPTER 3

LOGICAL SYSTEM DESIGN

A: BUSINESS RULES

1. The academics of IUB consists of School and Department.
2. Each School has a unique identifier and name.
3. Each School consists of several Departments. A department must belong to a School and a School must have at least one or more departments.
4. Departments have departmentID to uniquely identify each department as well as department name.
5. Departments offer courses. A department must offer one or many courses. At least one course must belong to one department.
6. Courses have CourseID, number of credits, course name, number of sections, departmentID, classroomNumber, prerequisite.
7. A course must be taught by one Faculty. A faculty may take one or more courses.
8. One course must have at least one or more sections.
9. Faculty has facultyID, faculty name, courseID.
10. A section must have one Faculty assigned to a specific classroom. A Faculty can take one or more sections.
11. Courses are offered every semester. Semesters have a session and year.
12. Semesters can be identified using both session and year.
13. Sections have section number, courseID, semester session and year, classroomNumber, facultyID, maximum_capacity, enrolled_capacity, class_time which has the starting and ending time of a class as well as the number of days, blockedStatus.
14. A faculty can hand over a course of a specific section to another faculty for a particular semester.
15. Classrooms are assigned to a specific section based on the enrollment capacity.
16. Classrooms are used in slots. For IUB, it is 6 slots or 7 slots for each day.
17. A section is assigned to only one slot at a time.
18. Each course must have at least one slot per week. For some courses, it can be two slots per week.

B: ENTITY RELATION DIAGRAM (ERD)

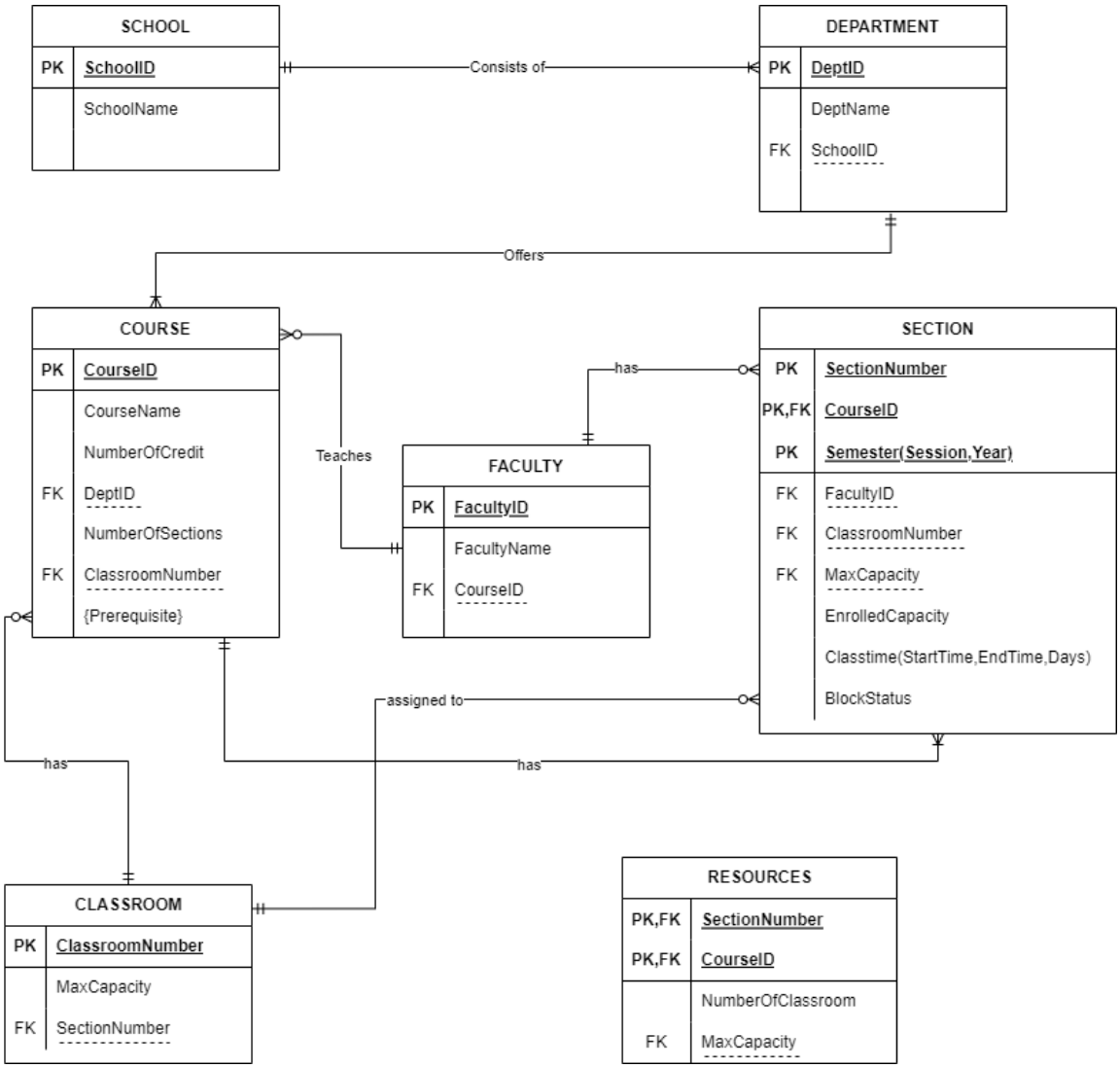

Figure 9: Entity Relation Diagram

C: RELATIONAL SCHEMA

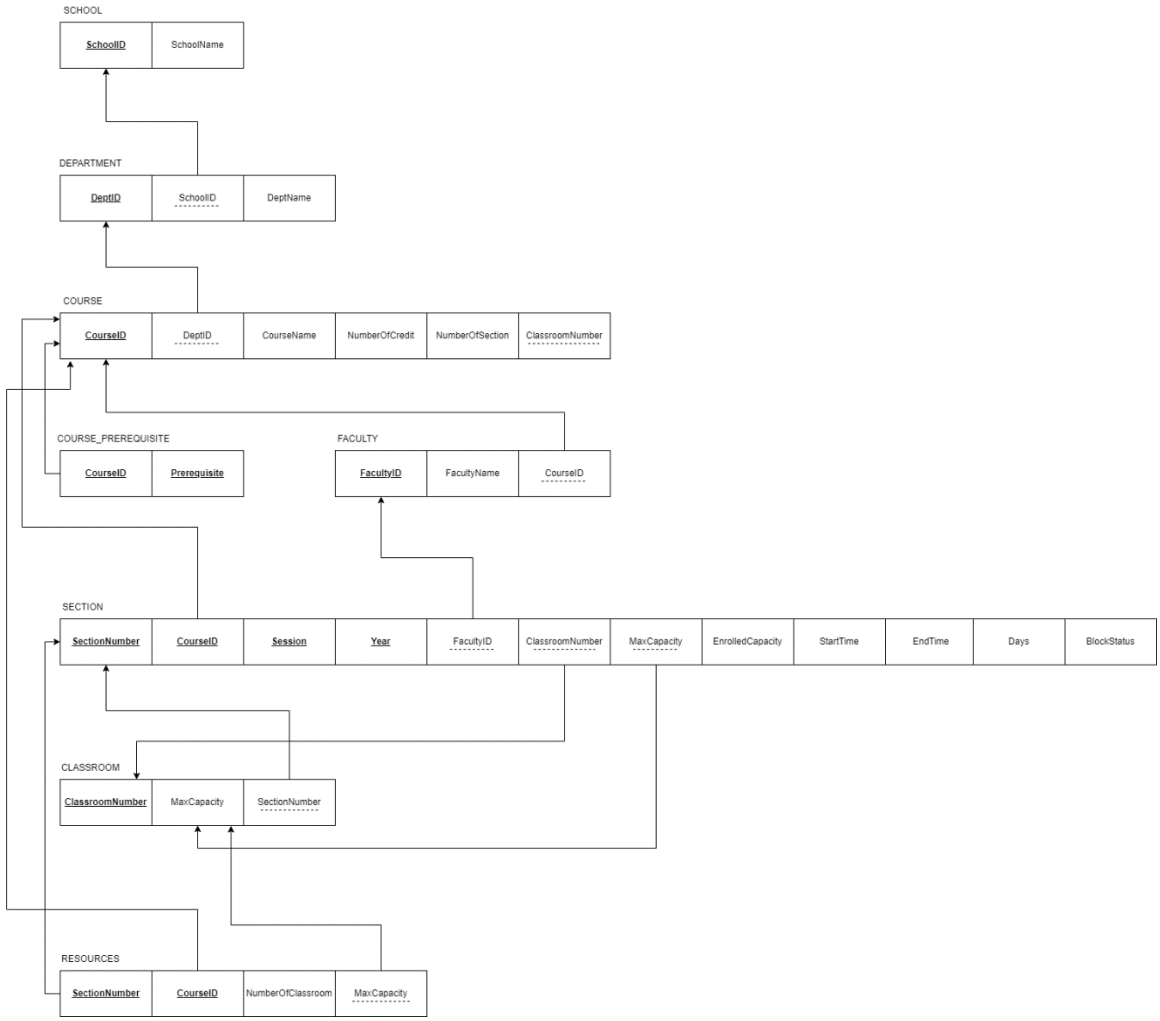

Figure 10: Relational Schema

D: NORMALIZATION

DeptID ⟶ DeptName, SchoolID

CourseID ⟶ NumberOfCredit, CourseName

DeptID, SectionNumber, CourseID, Session, Year ⟶ FacultyID, classroomNumber, MaxCapacity, EnrolledCapacity, StartTime, EndTime, Days, BlockStatus

ClassroomNumber ⟶ MaxCapacity, SectionNumber

SchoolID ⟶ SchoolName

FacultyID ⟶ FacultyName

Prerequisite ⟶ CourseID

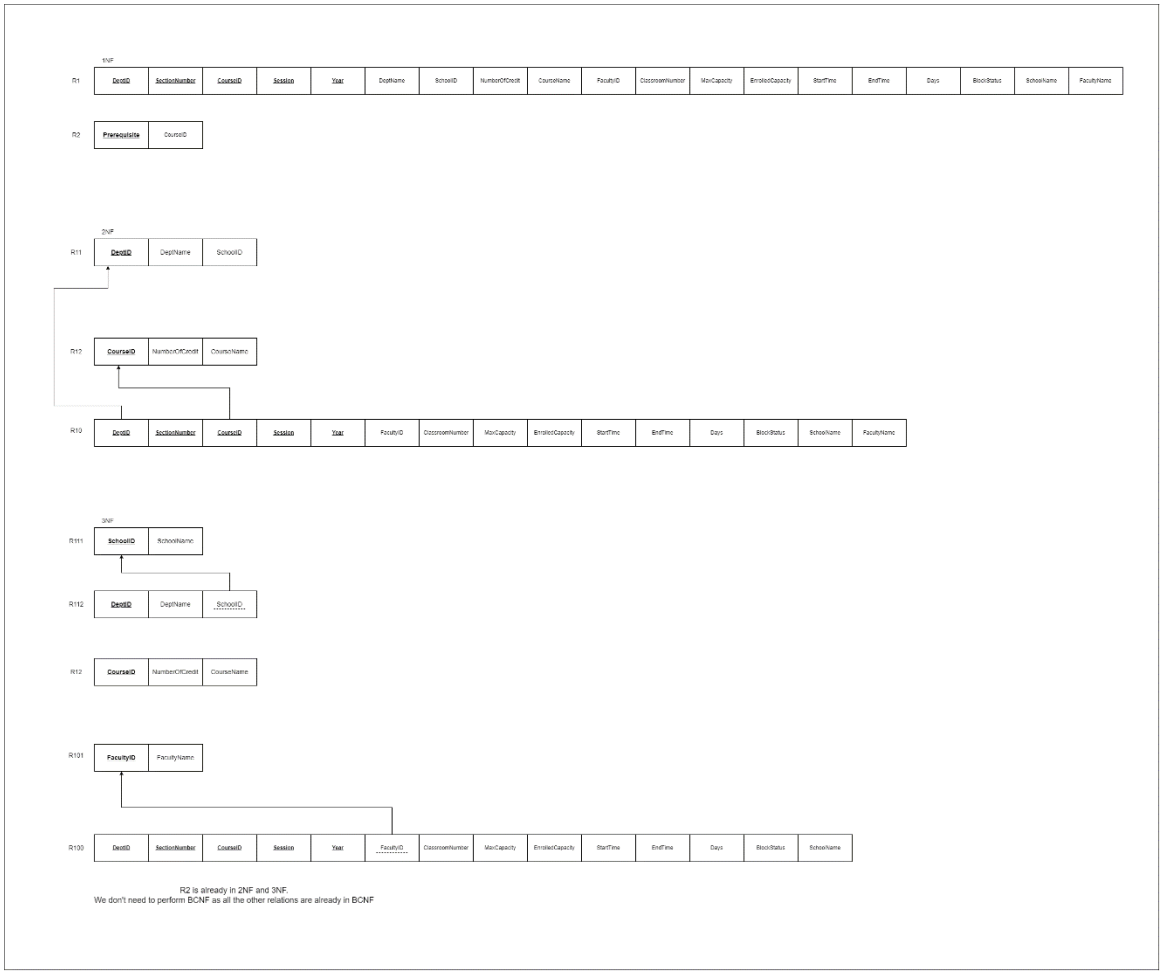

Figure 11: Normalization

E: DATA DICTIONARY

SCHOOL:

Name	type	Size	Remark
SchoolID	VARCHAR	6	This is the primary Key of this relation. It contains the ID of the school. Ex: SETS
SchoolName	VARCHAR	30	This is the name of the school Ex: School of engineering and technology.

DEPARTMENT:

NAME	TYPE	SIZE	REMARK
DeptID	VARCHAR	5	This is the primary key Of this relation which contains the ID of dept Ex: CSE, EEE
DeptName	VARCHAR	30	This is the name of dept. Ex: Computer Science and Engineering.
SchoolID	VARCHAR	6	This is the foreign key from SCHOOL table.

Course:

NAME	TYPE	SIZE	REMARK

CourseID	VARCHAR	10	This is the primary key Of this relation which contains the ID of course. Ex: CSE303
CourseName	VARCHAR	30	This is the name of course. Ex: Database management system
NumberOfCredits	NUMBER	1	It contains the number of credits for a course. Ex: 3 credits for DBMS
DeptID	VARCHAR	10	This is the foreign key from Department table.
NumberOfSections	NUMBER	3	It contains number of sections. Ex:4 Section in
ClassroomNumber	NUMBER	6	It contains the number of classrooms Ex: 5
Prerequisite	VARCHAR	6	It contains number of prerequisite courses. Ex: 203 prerequisite 201

FACULTY:

NAME	TYPE	SIZE	REMARK
FacultyID	VARCHAR	4	This is the primary key of the relation.

			It contains the Id of the faculty. Ex:4242
FacultyName	VARCHAR	30	It contains the name of the faculty. EX: Ms. Sadita Ahmed
CourseID	VARCHAR	7	Course Id is the foreign Key from COURSE table.

SECTIONS:

NAME	Type	Size	Remark
SectionNumber	NUMBER	10	This is the primary key of this relation. It contains the total number of sections. Ex: CSE 303 HAS 4 SECTIONS
CourseID	NUMBER	10	This is the primary key as well as a foreign key from COURSE table.
Semester	VARCHAR	15	This is a primary key of this relation. It contains the session and year of the semester. Ex: Summer,2022
FacultyID	NUMBER	10	Faculty ID is the foreign key from FACULTY table.
ClassroomNumber	NUMBER	10	Classroom number is a foreign key from CLASSROOM table.
MaxCapacity	NUMBER	3	This is a foreign key from CLASSROOM

EnrolledCapacity	NUMBER	2	It contains the number of enrolled capacity. Ex: CSE303 has 30 seats
StartTime	VARCHAR	6	It contains the time and date of a course. Ex:8AM
BlockStatus	bool		It will check section block or not Ex: section is block or not.
EndTime	VARCHAR	6	It contains the time and date of a course. Ex: 11am
Days	VARCHAR	2	It contains the time and date of a course. Ex: MW

CLASSROOM:

Name	Type	Size	Remark
ClassroomNumber	VARCHAR	6	This is the primary key of this relation it contains the classroomNumber. Ex:BC5004
MaxCapacity	NUMBER	6	It contains the maximm capacity of the class. Ex: CSE303(30)
SectionNumber	NUMBER	6	This is a foreign key from SECTION.

RESOURCES:

NAME	Type	Size	Remark
SectionNumber	NUMBER	7	This is a foreign key from section table

CourseID	NUMBER	7	This is a foreign key from course table
NumberOfClassroom	NUMBER	7	This contains total number of classroom
MaxCapacity	NUMBER	7	This is a foreign key from Classroom table