Student Performance Monitoring System (SPMS)

FINAL REPORT

GROUP 02

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CHAPTER 1

INTRODUCTION

- BACKGROUND OF THE PROJECT
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A. BACKGROUND OF THE ORGANIZATION:

Independent University, Bangladesh (IUB) was established in 1993. It 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 predicted to grow at about 10% annually. Since its inception, IUB has shown remarkable outcomes in producing graduates with marketable skills by being sincere, staying disciplined, and up to date with the ongoing curriculum and progress system.

IUB has five main school distinctions under its name and they are as follows:

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

IUB also provides massive percentage-based tuition fee waivers and scholarships for a huge proportion of these students, more than most private universities of the country. This greatly helps the financial guarantors of the students to keep up with the expenses of studies.

Furthermore, IUB is also constantly developing and improving its lab facilities and flourishing on its curriculum according to current corporate world demands, greatly diminishing the outraging gap between academic curriculum and the professional job market.

B. BACKGROUND OF THE PROJECT:

Currently, the student marking monitoring system of IUB students is done completely manually through the means of excel files and previously determined PLOs and COs from the IEB, UGC, and mapped by the respective department of each major. The stakeholders, department, or any higher authorities do not have an automated system through which they can visualize the performance data of the students throughout the semesters. So we have to change that to an automated process for everybody's convenience.

C. OBJECTIVE OF THE PROJECT:

The Student Performance Monitoring System (SPMS) that we are going to build will get all student performance data from the respective faculties and departments and vividly summarize and present all the performance data including various sorts of graphs to make it crystal clear for the Stakeholders and all the higher authorities to understand without much effort. The faculties no longer have to create vast excel sheets representing all the marks and CO/PLO achievements of each student manually, instead, the faculty will just have input the marks of each student onto the SPMS and it will automatically do all the work for the faculty, making it tons easier, faster and less hectic for the individuals. As it is all done by computer systems, the process will be instantaneous, unlike a very lengthy process from before, and all the stakeholders that have access to the system will be able to see the data right away without any issues.

D. SCOPE OF THE PROJECT:

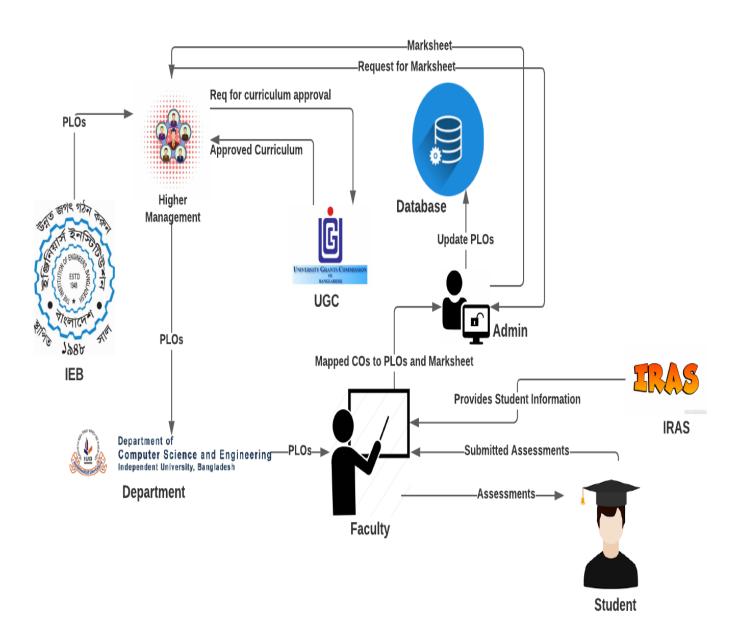
As we have done a thorough analysis of the existing marking and evaluation system and found out that there are several issues within the entire process that can lead to serious amounts of waste in time and resources. Our proposed Web Application system known as the Student Performance Monitoring System (SPMS) will eradicate all these unnecessary consumption of resources and throw them to be done automatically at the system backend. The system will include a Relational Database Management System (RDBMS) server to store and edit/update all the performance information of the student in the enrolled courses. The Web Application will have seamless and intuitive User Panels or Graphical User Interfaces (GUIs) to make it easily operable for every stakeholder involved. Each individual user type will be able to observe and download all the student data in a way that is visualized extremely vividly and also that fits most suitable for them to understand. Moreover, all the data will be stored on the server protected by hightier cyber security means, and each user type will have access to the specific data that is relevant to only them in order to maintain the best quality privacy for every user or stakeholder.

CHAPTER 2

REQUIREMENT ANALYSIS

- RICH PICTURE AS-IS
- SIX ELEMENTS AS IS
- PROCESS DIAGRAM AS-IS
- PROBLEM ANALYSIS
- RICH PICTURE TO-BE
- SIX ELEMENTS TO-BE
- PROCESS DIAGRAM TO BE

A. Existing Business System:



B. Six Element Analysis of Existing Business:

process	Human	Non- computing Hardware	Computin g Hardware	Software	Database	Communication & Network
STUDENT'S ASSESSM ENT	1.Facult y: a)Create Questio n Paper. a) Takes exam of students in the form of quizzes, midterm and final term by providin g question s. b) Create assessm ent report. c) Send the assessm ent report to admin 2.	Paper: a) Used to prepare hardcopy of question papers that are used to assess students in exams. b) Used to prepare hardcopy assessme nt report. c) Used to provide hardcopy of answer script to the faculty. 2. Station	1.Computer: a) Used to prepare softcopy of question papers that are used to assess students in exams. b) Used to prepare softcopy assessment report. c) Used to prepare softcopy to the faculty. d) Used	1. Microso ft Word: a) Used to prepare softcopy of question papers that are used to assess students in exams. b) Used to prepare softcopy of answer script to faculty. 2. Microso ft Excel: a) Used to prepare softcopy assessmen t report. 3. Gmail: a) Used to	1.Google Drive: a) Used to store and backup all softcopy of questions, answer scripts and assessme nt reports on the internet.	1.ISP: a) Provides Internet service so that the use of Gmail, Google Drive and Dropbox is possible.

Student	ery:	to store	send	
:	a) Used	all	softcopy	
a)	to check	softcopy	of	
Answers	hardcopy	of	questions,	
the	of	questions,	answer	
question	answer	answer	scripts	
S	script	scripts	and	
provided	provided	and	assessmen	
by	by	assessme	t reports	
Faculty.	students.	nt	to	
b)	b) Used	reports.	designated	
submit	to fill		personnel.	
the	answer	2.Printer		
answer	scripts	:		
paper to	that are	a) Used		
the	to be	to print		
faculty.	provided	the		
3. Admin	to	questions		
:	faculty.	on		
a)		to paper.		
Receives	3.Store	b) Used		
and	Room:	to print		
stores	a) Used	the		
assessm	to store	assessme		
ent	all	nt		
report	hardcopy	report.		
of	of	c) Used		
students	questions,	to print		
provided	answer	the		
by	scripts	answer		
Faculty.	and .	script.		
b) Store	assessme	•		
the	nt			
marks of	reports.			
the	· ·			
student				
in the				
Databas				
e.				

Process	Human	Non- computing Hardware	Computi ng Hardwa re	software	Database	Communication & Network
Curricul um Approva I by UGC	1. Higher Managem ent: a) Forms a committe e of faculty to prepare a curriculu m in accordan ce to the guideline provided by UGC. b) Receives proposed curriculu m provided by the designate d faculty committe e. c) Requests	1.Paper: a) Used to prepare hardcopy of faculty committe e details, UGC guidelines, proposed/corrected curriculum, approved curriculum. 2.Station ery: a) Used for handwritt en mind mapping in regards to faculty committe e details, proposed/	1.Comp uter: a)Used to receive, store and analyze UGC guidelin es. b) Used to prepare and store softcop y of faculty committ ee details, propose d/ correct ed curricul um, and approve d	1.PDF Reader: a) Used to view and store the softcopy of received guidelines from UGC, faculty committee details, proposed/c orrected curriculum and approved curriculum in PDF format. 2.Microsof t Word: a) Used to prepare, view and store softcopy of faculty committee details, proposed/c	1.Google Drive: a) Used to store and backup all softcopy of faculty committee details, UGC guidelines, proposed/c orrected curriculum, approved curriculum on the internet.	1.ISP: a) Provides Internet service so that the use of Gmail, Google Drive and Dropbox is possible.

UGC	correct	curricul	orrected	
for	ed	um.	curriculum	
approval	curriculum	2.Print	and	
of	,	er:	approved	
curriculu	approved	a) Used	curriculum	
m.	curriculum	to print	in word	
d.		hardcop	format.	
Receives	3.Store	y of	2.Microsof	
approval	Room:	faculty	t Excel:	
or	a) Used to	committ	a) Used to	
necessar	store	ee	prepare	
У	hardcopy	details,	softcopy	
correctio	of	UGC	for the	
n details	approved	guidelin	mapping of	
from	curriculum	es,	CO to PO	
UGC.		propose	while	
e) Sends		d/	creating	
confirma		correct	courses for	
tion of		ed	the	
approved		curricul	curriculum.	
/correct		um,	3.Gmail:	
е		approve	a)Used to	
d		d	send	
curriculu		curricul	softcopy of	
m to		um.	faculty	
admin for			committee	
storing.			details,	
			UGC	
2.UGC:			guidelines,	
a)Receive			proposed/c	
S			orrected	
request			curriculum,	
from			approved	
higher			curriculum	
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ent for			designated	
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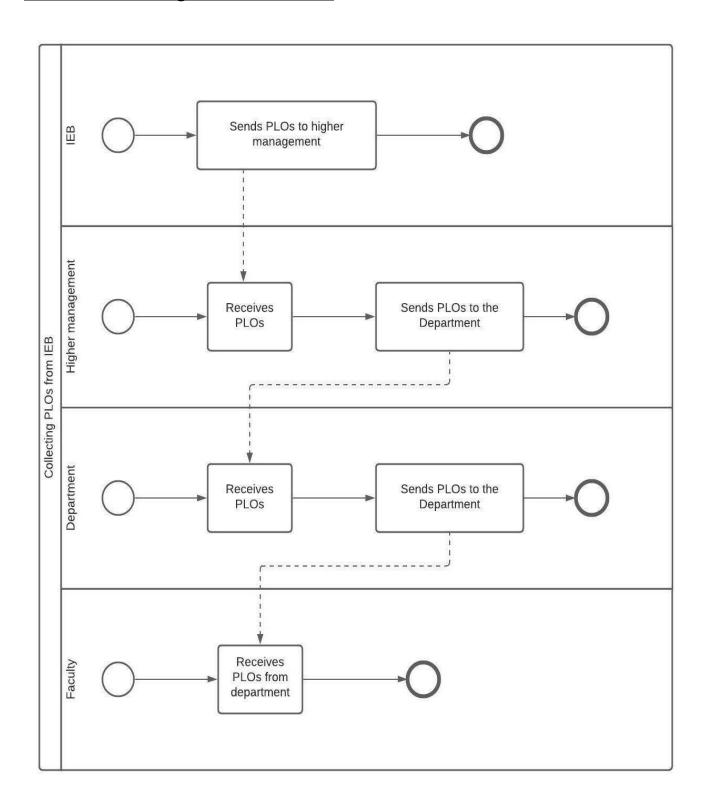
Process	Human	Non- computing Hardware	Computing Hardware	software	Databa se	Communication & Network
Collecti ng PLOs from IEB	1. IEB: a) Send PLOs to higher managemen t. 2. Higher Managemen t: a) Receives PLOs from IEB b) Send PLOs to the department . 3. Departm ent: a) Send the PLOs to the Faculty 4. Faculty: a) Receives PLOs from the Departmen t.	1.Paper: a) Used to prepare hardcopy Of the PLOs 2.Station ery: a) Used for handwritt en assessmen to create PLO report. 3.Store room: a) Used to store hardcopy of PLO report.	1.Comput er: a) Used to prepare and store softcopy of PLO report. 2.Printer: a) Used to print hardcopy of PLO report	1.PDF Reader: a) Used to view and store the softcopy of PLO report 2. Microsoft Excel: a) Used to prepare, view and store softcopy of PLO report in Excel Shit. 3.Gmail: a. Used to send/rece ive softcopy of PLOs from IEB to Higher manageme	1.Goog le Drive: a) Used to store and backup all softco py of PLO Report on the interne t.	1.ISP: a) Provides Internet service so that the use of Gmail, Google Drive and Dropbox is possible.

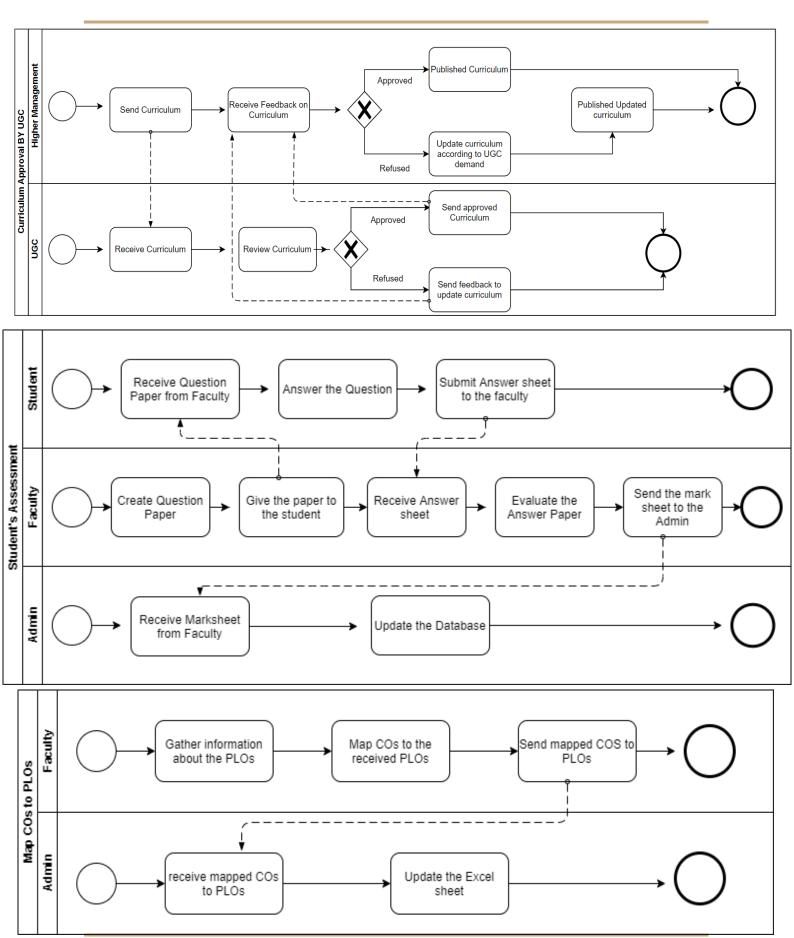
		nt to faculty to Admin personnel.		

Process	Human	Non- computin g Hardwar e	Computing Hardware	software	Databas e	Communication & Network
	1. Faculty Member a) Maps the COs	Paper a) Used if the faculty member or the	1. Com put er a) Used to edit the COs'	1. Mic ros oft Excel: a) Used to store the	1.Googl e Drive: a) Contains the mapped	1. ISP: a)Provides Internet service so that the use of Gmail, Google Drive and Dropbox

Mappin	from	admin	Excel	mapped	COs.	is possible.
g of	PLOs	wishes	file.	COs.		
COs to	based	to print			2. Hard	
PLOs	on	out the	2. Printer	2. Web	Сору	
	the	mapped	a) Used to	Browser:	storage:	
	syllabus	COs.	print out	a) To send	a)	
	covered		the	and	Contains	
	in the		COs for	receive	the	
	course.		hardcopy	the COs	hardcop	
	b)		storage	through	у	
	Sends		backup in	email.	version	
	the		case		of	
	mapped		something		the	
	COs		happens to		COs'	
	to the		the digital		Excel	
	admin		version.		file for	
	through		V 61 61611.		backup.	
	email.				Buomup.	
	2.					
	Admin					
	a)					
	Receives					
	the					
	mapped					
	COs					
	from					
	the					
	faculty					
	member.					
	b)					
	Updates					
	it					
	in the					
	excel					
	file.					
	1					

C. Process Diagram (AS-IS):



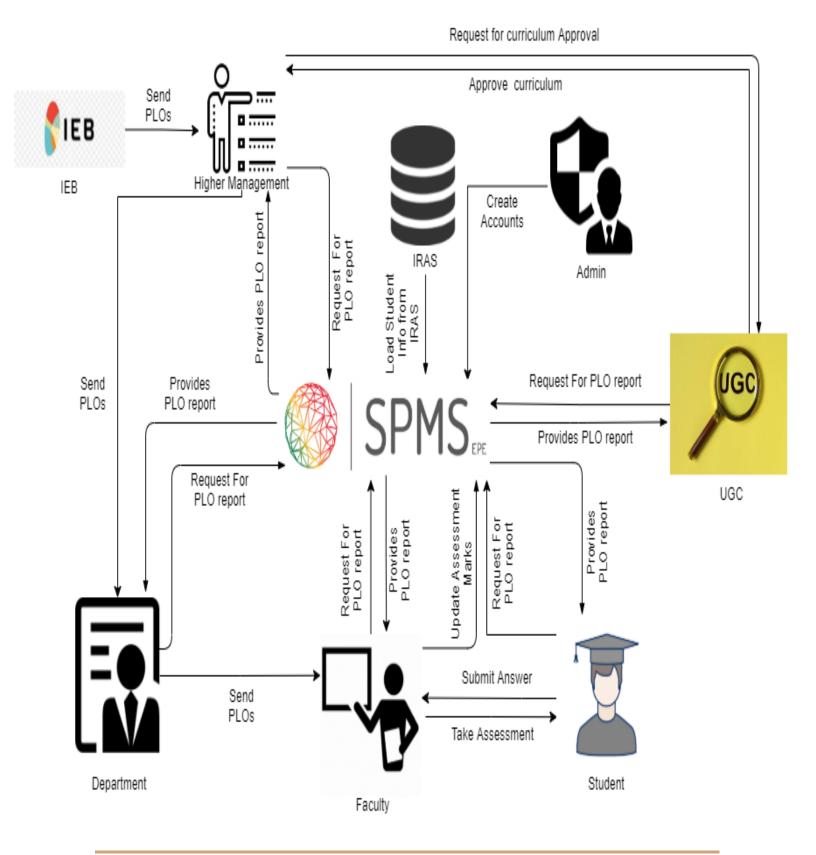


Problem analysis Of the Existing System:

Process	Stakeholder	Concerns	Analysis	Proposed
Name	s	(Problems)	(Reason of	Solution
			the Problem)	
	1.Faculty	The Faculty	Since the	Our
		members	faculty has	software
	2. Admin	have to	to send the	allows the
		provide the	mark sheet	faculty to
		mark sheet	all the way	directly
		to Admin and	to the admin	update the
		then	before	marks to the
		the Admin	getting	database.
		enters the	uploaded to	Hence, the
STUDENT'S		mark sheet	the	use or
ASSESSMENT		into the	database, it	participation
		Database.	takes up	of the admin
		This	much of the	is not
		process	time and also	required.
		becomes too	uses	
		time-	unnecessary	
		consuming	resources.	
		and		
		uses up a lot		
		of extra		
		resources.		

	1. Faculty	The CO, PLO	The entire	Our
		achievement	CO, PLO	software is
		analysis has	achievement	designed to
		to be done	analysis	do the entire
		by the	table, and	CO, PLO
		faculty by	the passing	achievement
		manually	of the data	analysis by
		entering	is extremely	itself. All
PLO/CO		marks of	time-	the faculty
Achievement		each student	consuming.	has to do is
Analysis		to finalize		enter the
		whether		marks in the
		they pass or		desired
		fail. The		field.
		analysis has		
		to be sent to		
		the admin to		
		be uploaded		
		to the		
		database.		

E. Rich Picture of Proposed System:



F. Six Element Analysis of Proposed System:

Process	System Roles					
	Human	Non-Comp	Comput	Software	Database	Network &
		Hardware	ing			Communication
			Hardwa			
			re			
	1.Faculty	1.Paper:	1.Comp	1.Microso	1.Google	1.ISP:
	:	a) Used to	uter:	ft Word:	Drive:	a) Provides
		prepare	a) Used	a) Used to	a) Used to	Internet
	a)Create	hardcopy	to	prepare	store and	service so
	Question	of question	prepar	softcopy	backup all	that the use of
	Paper.	papers	е	of question	softcopy	Gmail, Google
		that are	softcop	papers	of	Drive and
	b) Takes	used to	У	that are	questions,	SPMS
	exam of	assess	of	used	answer	is possible.
	students in	students in	questio	to assess	scripts and	
	the	exams.	n	students in	assessmen	
	form of		papers	exams.	t reports	
	quizzes,	b) Used to	that	-	on the	
	midterm	prepare	are	b) Used to	internet.	
	and final	hardcopy	used to	prepare	2. SPMS -	
	term by	assessmen	assess studen	softcopy of answer	Updates	
	providing	†	ts in	script to	and stores	
	questions.	report.	exams.	faculty.	mark	
STUDE		->	CAUTIS.	racarry.	sheet in	
NT'S	c) Create	c) Used to	b)	2.Microso	MySQL	
ASSESS	assessmen	provide hardcopy	Used	ft Excel:	, = Q2	
MENT	t report.	of answer	to	a) Used to		
MCIVI	م د جا د جا د جا	script	prepar	prepare		
	d) Updates	to the	e	softcopy		
	assessmen t marks	faculty.	softcop	assessmen		
	directly to	, .	у .	t		
	SPMS	2.Statione	assess	report.		
	31 74(3	ry:	ment			
	2.Student	a) Used to	report.	3.Gmail:		
	L.Oludeni	check		a) Used to		

:	bandassii	م) الممط	aand	
a) Answers	hardcopy of	c) Used to	send	
the			softcopy of	
questions	answer script	prepar e	questions,	
-	•		•	
provided	provided	softcop	answer	
by Faculty	by	y	scripts and	
Faculty.	students.	of	assessmen	
b) submit	b) Used to	answer	t reports	
the answer	fill	script	to	
paper to	answer	to the	designated	
the	scripts	faculty.	personnel.	
faculty.	that are to	d)		
	be	Used		
	provided	to		
	to	store 		
	faculty.	all		
		softcop		
	3.Store	y of		
	Room:	questio		
	a) Used to	ns,		
	store	answer		
	all	scripts		
	hardcopy	and		
	of	assess		
	questions,	ment		
	answer	reports		
	scripts	•		
	and			
	assessmen	2.Print		
	†	er:		
	reports.	a) Used		
		to print		
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fre	om UGC.	hardcopy	a) Used	curriculum	
(e)	Sends	of	to print	in word	
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	curriculum.					
	1. IEB:	1.Paper:	1.Comp	1.PDF	1.Google	1.ISP:
	a) Send	a) Used to	uter:	Reader:	Drive:	a) Provides
	PLOs to	prepare	a) Used	a) Used to	a) Used to	Internet
	higher	hardcopy	to	view and	store and	service so
	manageme	Of the	prepar	store the	backup all	that the use of
	nt.	PLOs	e and	softcopy	softcopy	Gmail, Google
			store	of	of PLO	Drive
	2. Higher	2.Statione	softcop	PLO report	Report on	is possible.
	Manageme	ry:	y of PLO	2	the internet.	
	nt:	a) Used		2.	internet.	
	a) Receives	for handwritte	report.	Microsoft Excel:		
Collectin	PLOs from IEB		2.Print			
	b) Send	n	er:	a) Used to		
9 PLOs	PLOs to	assessmen t to	a) Used	prepare, view and		
from	the	create	to print	store		
IEB	departmen	PLO	hardco	softcopy		
	t.	report.	py of	of PLO		
			PLO	report in		
	3.Departm	3.Store	report	Excel Shit.		
	ent:	room:				
	a)Send the	a) Used to		3.Gmail:		
	PLOs to	store		a. Used to		
	the	hardcopy		send/recei		
	Faculty	of PLO		ve		
		report.		softcopy		
	4. Faculty:			of		
	a) Receives			PLOs from		
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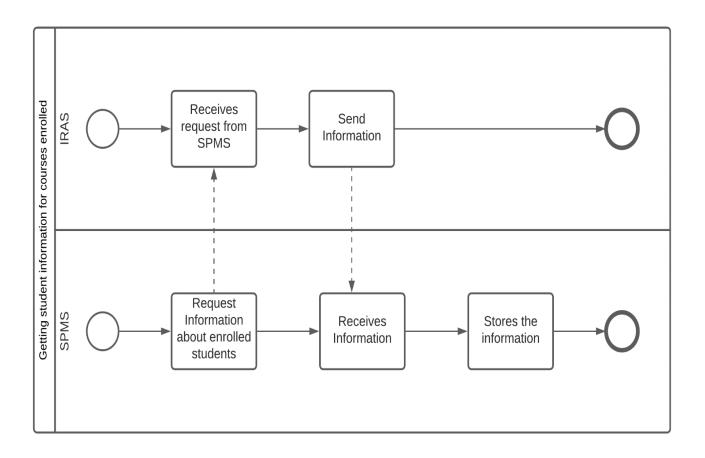
		Admin personnel.	

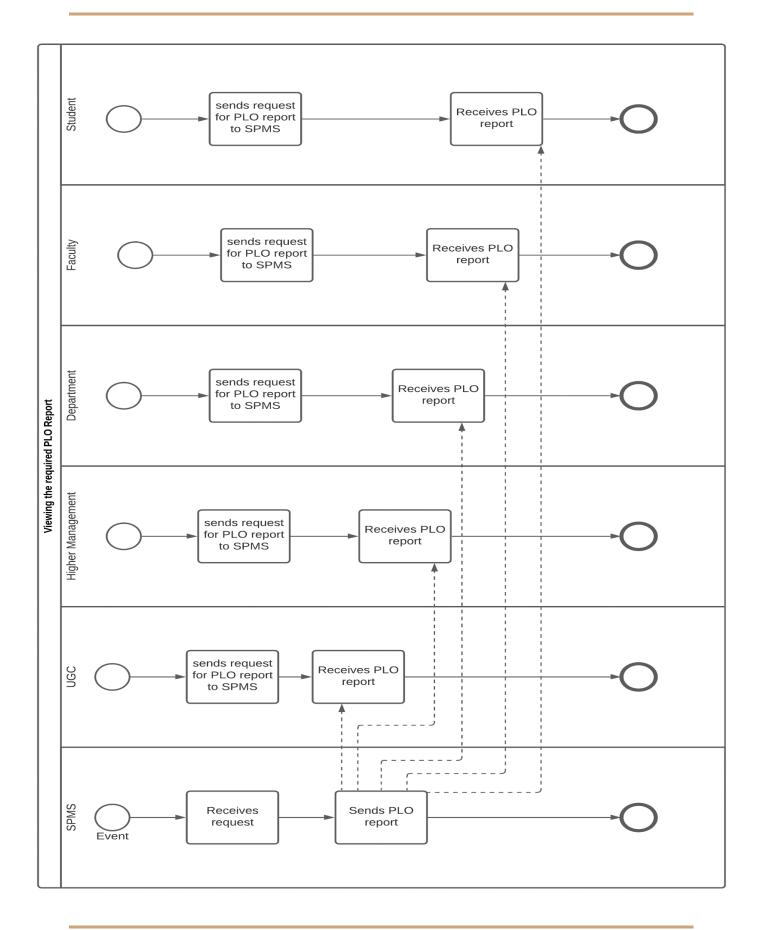
Getting student informat ion for courses enrolled			Server Comput er - SPMS sends request s to IRAS for studen t inform ation on courses enrolle d each semest er throug h API.	a) Sends requests to IRAS for Student informatio n on courses enrolled each semester through API. 2. IRAS: a) Sends requested informatio n to SPMS.	1.MySQL: Stores Student informati on on courses enrolled each semester	1.ISP: SPMS and IRAS require internet which is provided by ISP.
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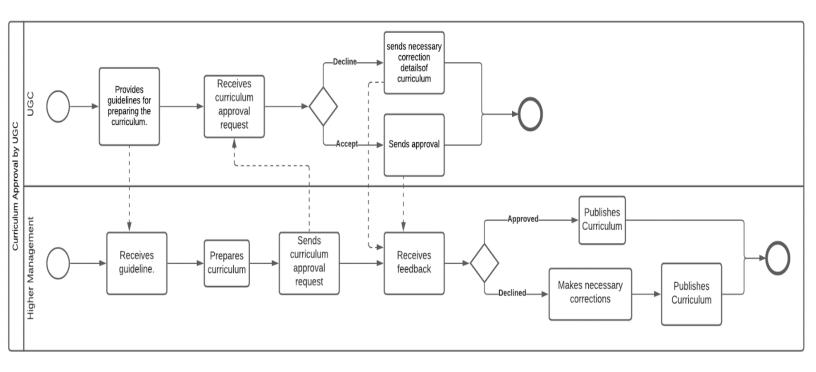
	1. UGC	1.Comp	1.SPMS:	1. MY	1. ISP:
	a) Request	uter:	Prepare	SQL:	Provides
	for	Used	the	Store the	Internet
	information	to	required	necessary	service to the
	on PLO	browse	PLO report	data which	Stakeholders
	report	PLO	for	are used	
	b) Get the		stakeholde	to make	so that they can access the
	informatio	reports			
	n from the	from	rs	the POL	information.
	system.	SPMS.	2 14/5	report.	
		2 Dh	2. Web		
	2.Higher	2. Phone	Browser:		
Viewing	Manageme	 	Access the		
the	nt	Use to	SPMS		
required	a) Request	browse	website		
PLO	for	PLO			
Report	information	report			
	on PLO report	from			
	b) Get the	SPMS			
	informatio				
	n from the				
	system.				
	system.				
	3.Departm				
	ent				
	a) Request				
	for				
	information				
	on PLO				
	report				
	b) Get the				
	informatio				
	n from the				
	system.				
	4.Faculty				
	a) Request				
	for				
	information				
	on PLO				
	report				
	b) Get the				
	informatio				
	n from the				

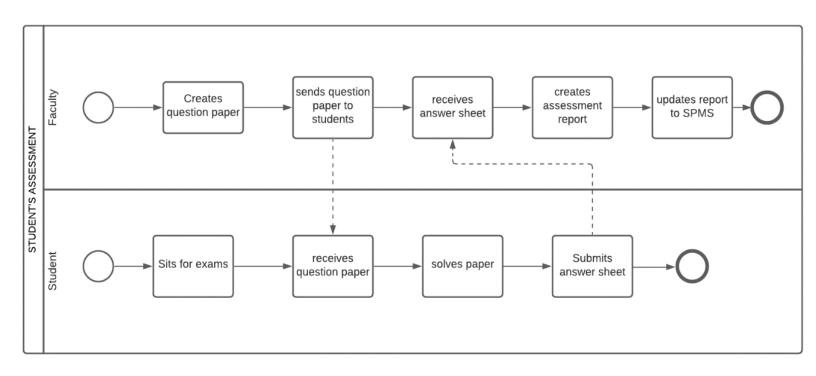
system.			
5. Student			
a) Request			
for information			
on PLO			
report			
b) Get the			
informatio			
n from the			
system.			

G. Process Diagram (TO-BE):









CHAPTER 3

LOGICAL SYSTEM DESIGN

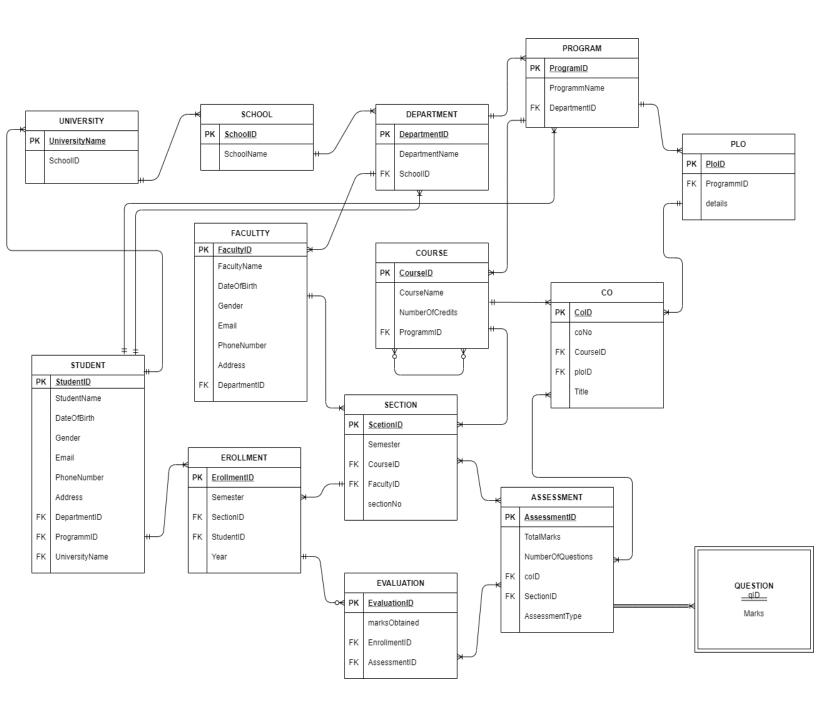
- BUSINESS RULE
- ENTITY-RELATIONSHIP DIAGRAM
 - ENTITY RELATIONSHIP DIAGRAM TO RELATIONAL SCHEMA
- NORMALIZATION
- DATA DICTIONARY

BUSINESS RULE

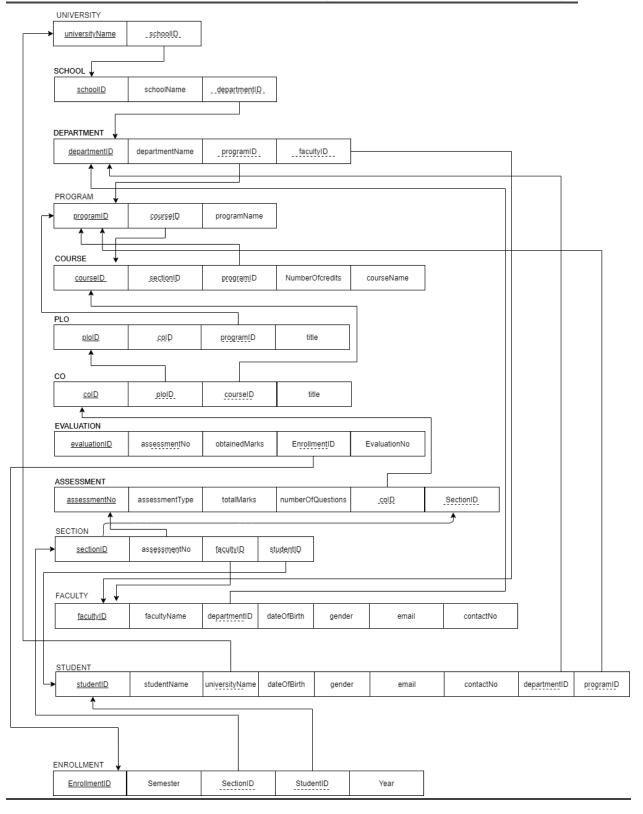
The goal of the software is to increase efficiency in monitoring the students' performance. The SPM system is where all the PLO(Program Learning Outcome) and CO(Course Outcome) is stored. The CO needs to be updated by the faculty for each course and before the semester starts to map the COs to the PLOs so that they can check if each student has achieved the required PLOs.

In the system, IEB has no authorization to update the PLOs, so it has to send it to the Admin and then the Admin updates the PLO for the faculties to map. The faculties can update the COs based on the given PLOs. The students can view their achieved PLOs for a particular course they've taken and see the required PLOs for the program in the system UGC has no authorization in monitoring the student's performance so they have to request it through admin in order to view it.

ENTITY-RELATIONSHIP DIAGRAM



ENTITY RELATIONSHIP DIAGRAM TO RELATIONAL SCHEMA



NORMALIZATION

	EnrollmentID	e1		EvaluationID	v1
	semester	e2	Evaluation	evaluationNo	v2
Enrollment	year	е3		obtainedMarks	v3
	StudentID	†1		assessmentNo	a 1
	SectionID	q1		EnrollmentID	e1
	SectionID	q1		StudentID	†1
	sectionNo	q2		studentName	t2
Section	semester	q 3		UniversityName	u1
	CourseID	01	Student	dateOfBirth	†4
	FacultyID	f1		gender	†5
	CourseID	01		email	†6
<i>C</i> ourse	courseName	02		phone	† 7
	noOfCredits	03		address	†8
	courseType	o4		DepartmentID	d1

	ProgramID	r1		ProgramID	r1
	ProgramID	r1		FacultyID	f1
Program	programName	r2		facultyName	f2
	DepartmentID	d1			
	CourseID	o1	Faculty	gender	f4
Course	courseName	o2	, racarry	dateOfBirth	f5
	no Of Credits	03		email	f6
	courseType	o4		phone	f7
	ProgramID	r1		address	f8
School	SchoolID	s1		DepartmentID	d1
	SchoolName	s2		assessmentNo	α1
со	coID	c1		marksObtained	α2
	coNo	c2	Assessment	coID	c1
	ploID	p1		SectionID	q1
	title	z1		NumberOfQuestions	×1
	CourseID	o1	PLO	ploID	p1

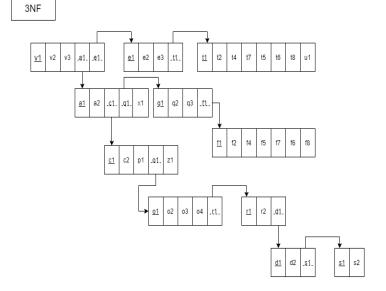
Department	DepartmentID	d1	ploNo	p2
	DepartmentNa me	d2	details	рЗ
	SchoolID	s1	ProgramID	r1
University	universityNam e	u1		
	schoolID	s1		

u1 →	s1
s1 →	s2
d1 →	d2, s1
r1 →	r2, d1
f1→	f3, f4, f5, f6, f7, f8, d1
t1→	t2, t4, t5, t6, t7, t8, r1, d1,u1
01→	o2, o3, o4, r1
p1 →	p2, p3, r1
c1 →	c2, p1, o1,z1
q1 →	q2, q3, o1, f1
e1 →	e2, e3, q1, †1
a1 →	a2, c1, q1,×1
v1→	v2, v3, a1, e1

universityName →	schoolID
SchoolID→	SchoolName
DepartmentID→	DepartmentName, SchoolID
ProgramID→	programName, DepartmentID
FacultyID→	facultyName, gender, dateOfBirth, email, phone, address, DepartmentID
StudentID→	studentName, dateOfBirth, gender, email, phone, address,DepartmentID,ProgramID,universityName
CourseID→	courseName, noOfCredits, courseType, ProgramID
plolD→	ploNo, details, ProgramID
colD→	coNo,ploID,CourseID,title
SectionID→	sectionNo,semester,CourseID,FacultyID
EnrollmentID→	semester, year, SectionID, StudentID
assessmentNo→	ocID, SectionID,assessmentType, NumberOfQuestions
EvaluationID→	evaluationNo,obtainedMarks,assesmentNo,EnrollmentID

1NF <u>v1</u> s1 f7 t2 t6 t7 t8 p2 f1 f2 f6 f8 t1 t4 t5 01 02 03 04 р3 c1 c2 q1 q2 q3 e1 e2 e3 a1 u1

2NF f6 t2 t5 t6 t7 01 02 03 p2 р3 c1 c2 q1 q2 e2 e3 a1 a2 р1 v3 q3 <u>v1</u>



BCNF

No non-key can identify any primary key or part of the primary key. Therefore, all the relations are already in BCNF.

DATA DICTIONARY:

university_T

Name	Data Type	Size	Remark
UniversityName	VARCHAR	15	This is the Primary Key of the Department. Example: "IUB"
SchoolID	VARCHAR	10	This is the Foreign Key of the table School. Example: "SETS"

Department_T

Name	Data Type	Size	Remark
DepartmentID	VARCHAR	10	This is the Primary Key of the Department. Example: "CSE"
DepartmentName	VARCHAR	30	This is the name of the Department. Example: "Computer Science and Engineering"
school_id	VARCHAR	5	This is the Foreign Key of the table

	School.
	Example: "SETS"
	"SETS"

$School_T$

Name	Data Type	Size	Remark
SchoolID	VARCHAR	10	This is the Primary Key of School Example: "SETS"
SchoolName	VARCHAR	30	This is the name of the School. Example: "School of Engineering, Technology and Science"

Program_T

Name	Data Type	Size	Remark
ProgramID	VARCHAR	10	This is the Primary Key for a Program Example: "B.Sc".
ProgramName	VARCHAR	30	This is the name of the Degree Program. Example: "Bachelor of

			Science"
department_id	VARCHAR	10	This is the Foreign Key from the Department table. Example: "CSE"

Student_T

Name	Data Type	Size	Remark
StudentID	VARCHAR	10	This is the Primary Key for the Student. Example: "1930038"
StudentName	VARCHAR	30	This is the first name of the Student. Example: "Istiak Ahammad"
DateOfBirth	DATE	DD-MM-YY	This is the Date of Birth of the Student. Example: "08-11- 2000"
Gender	VARCHAR	3	This is the gender of the Student. Example: "M"

Email	VARCHAR	30	This is the email address of the Student. Example: "1930038@i ub.edu.bd"
Address	VARCHAR	35	This is the address of the Student. Example: "House 1, Road 1, Sector 1, Uttara, Dhaka, Bangladesh"
department_id	VARCHAR	10	This is the Foreign Key from the Department table. Example: "CSE"
programm_id	VARCHAR	10	This is the Foreign Key from the Program table Example: "B.Sc".
university_name	VARCHAR	15	Foreign Key from the university table Example: "IUB".

CO_T

Name	Data Type	Size	Remark
CoID	VARCHAR	10	This is the

			Primary Key for Course Outcome. Example:
CoNo	VARCHAR	10	This is the number of the Course Outcome. Example: "1"
course_id	VARCHAR	10	This is the Foreign Key from the Course table. Example: "CSE101"
plo_id	VARCHAR	10	This is the foreign key from the Program Learning Outcome table. Example: "PLO1"
Title	VARCHAR	50	This is the title of the Course Outcome. Example: "Deep Thinking"

PLO_T

Name	Data Type	Size	Remark
PloNo	VARCHAR	10	This is the primary key for Program Learning Outcome. Example: "PLO1"

program_id	VARCHAR	10	This is the foreign key from the Program table Example: "B.Sc".
details	VARCHAR	50	This is the details of the Program Learning Outcome. Example: "An ability to select and apply the knowledge, techniques, skills, and modern tools of the computer science and engineering discipline"

Faculty_T

Name	Data Type	Size	Remark
FacultyID	VARCHAR	10	This is the Primary Key for Faculty. Example: "1801"
FacultyName	VARCHAR	30	This is the name of the

			Faculty. Example: "Abu sayed"
DateOfBirth	DATE	DD-WW-YY	This is the Date of Birth of the Faculty. Example: "11-05- 1989"
Gender	VARCHAR	3	This is the gender of the Faculty. Example: "M"
Email	VARCHAR	30	This is the email address of the Faculty. Example: "abusayed@iub. edu.bd"
PhoneNumber	VARCHAR	20	This is the phone number of the Faculty. Example: "145687015"
department_id		10	This is the Foreign Key from the Department table. Example: "CSE"

Course_T

Name	Data Type	Size	Remark
CourseID	VARCHAR	10	This is the

			Primary Key for the Course. Example: "CSE203"
CourseName	VARCHAR	30	This is the name of the Course. Example: "Data Structure"
NumberOfCredits	VARCHAR	3	This is the credit for the Course. Example: "3"
program_id	VARCHAR	10	This is the Foreign Key from the Program table Example: "B.Sc".

Section_T

Name	Data Type	Size	Remark
SectionID	VARCHAR	10	This is the Primary Key for Section
Semester	VARCHAR	15	This is the semester name: "Autumn"
course_id	VARCHAR	10	This is the foreign key from the Course table. Example: "CSE101"
faculty_id	VARCHAR	10	This is the foreign key from Faculty table

			Example: "1801"
SectionNo	VARCHAR	5	This is the section number. Example: "1"

$Enrollment_T$

Name	Data Type	Size	Remark
EnrollmentID	VARCHAR	10	This is the Primary Key for Enrollment
Semester	VARCHAR	15	This is the semester of Enrollmen t Example: "Summer"
section_id	VARCHAR	10	This is the Foreign Key from the Section table
student_id	VARCHAR	10	This is the Foreign key from the Student Table. Example: "1930038"

Year	VARCHAR	5	This is the year of
			Enrollment
			Example: "2019"

Assessment_T

Name	Data Type	Size	Remark
AssessmentNo	VARCHAR	10	This is the Primary Key for Enrollment
marksObtained	VARCHAR	5	This is the marks of the assessme nt Example: "30"
numberOfQuestio n	VARCHAR	5	This is the number of questions in the assessme nt Example: "10"
co_id	VARCHAR	10	This is the Foreign Key from the Course
sectoion_id	VARCHAR	10	This is the Foreign Key from Section table
AssessmentType	VARCHAR	15	This is the type of assessment: "Mid

	Term"
--	-------

${\bf Evaluation_T}$

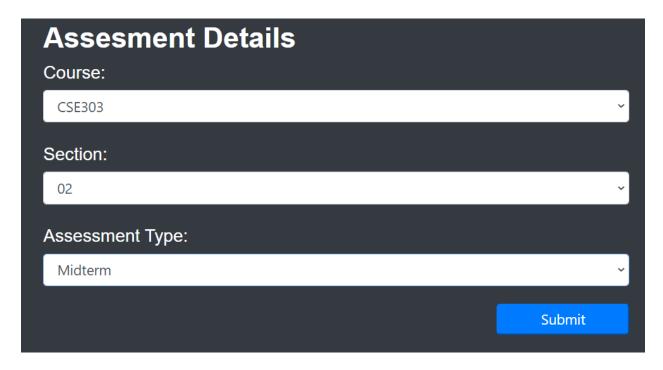
Name	Data Type	Size	Remark
EvaluationID	VARCHAR	10	This is the Primary Key for Evaluation
marksObtained	VARCHAR	5	These is the marks obtained by the Student Example: "29.5"
enrollment_id	VARCHAR	10	This is the Foreign Key from the Enrollment table
assessment_no	VARCHAR	15	This is the Foreign Key from the Assessment table

CHAPTER 4

PHYSICAL SYSTEM DESIGN

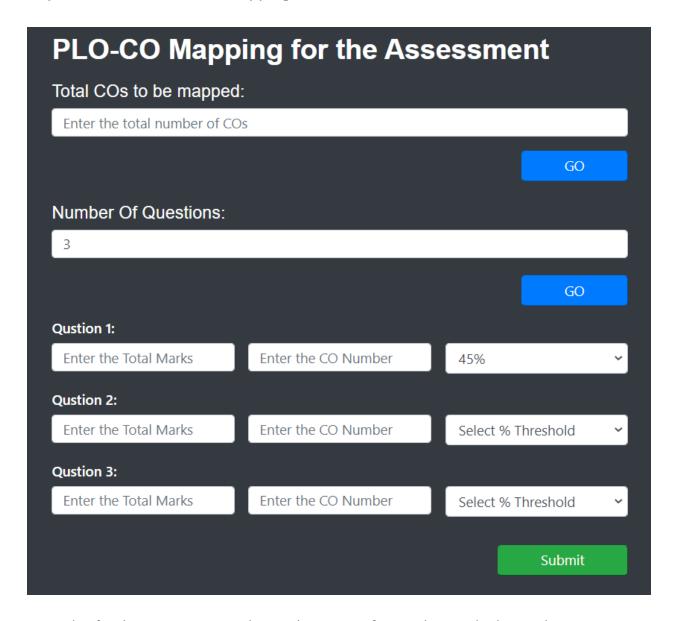
- INPUT FORMS
- OUTPUT VIEWS

Input form: Assessment Details



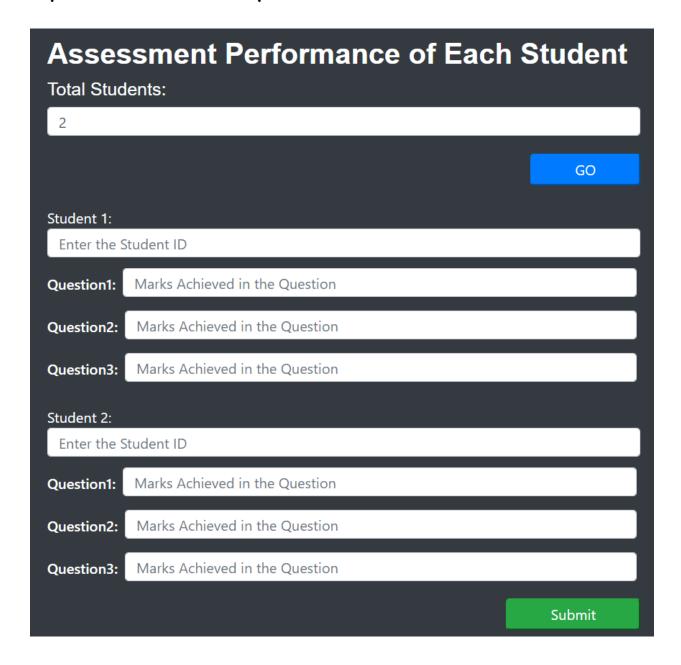
This is a faculty only screen. It allows the faculty to choose the following course and section along with determining the type of assessment. For ex. Final, Midterm or Quiz.

Input form: PLO-CO mapping for the assessment



Here the faculty gets to enter the total number of CO's along with the total number questions which will then generate a form for the faculty to input total marks for each question, associated CO number for each question and the percentage threshold.

Input form: Assessment performance of each student



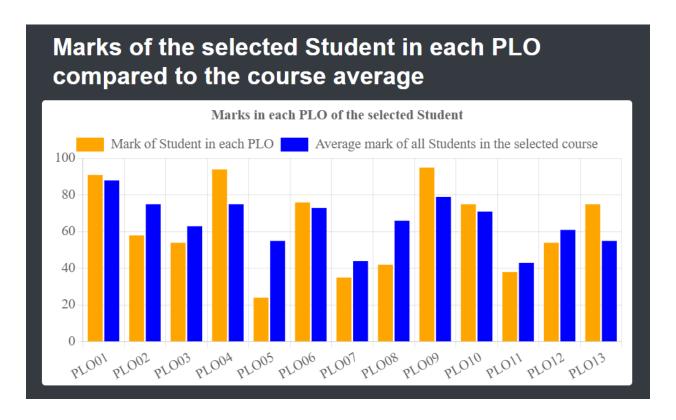
Here the faculty inputs the number of total students to be assessed. After selecting "go", inputs for all the students gets generated automatically.

OUTPUT VIEWS

Faculty Dashboard:

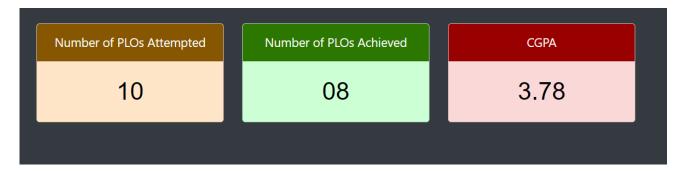


Student Wise PLO ANALYSIS:



```
SELECT AVG(TotalPlo.PLOpercentage) AS ActualPlo
            FROM (
            SELECT (PLO / TotalComark * 100) AS PLOpercentage
            FROM (
                   SELECT SUM(DISTINCT e.obtainedMarks) AS PLO, SUM(DISTINCT
a.marks) AS TotalCoMark
                   FROM performance_monitor_enrollment_t en,
                      performance_monitor_evaluation_t e,
                      performance_monitor_assessment_t a,
                      performance_monitor_co_t c,
                      performance_monitor_plo_t p
                   WHERE en.student_id = '{}'
                      AND en.enrollmentID = e.enrollment_id
                      AND e.assessment_id = a.assessmentNo
                      AND a.co id = c.coID
                      AND c.plo_id = '{}'
                   GROUP BY en.section_id
               ) ploPer
            ) TotalPlo;
```

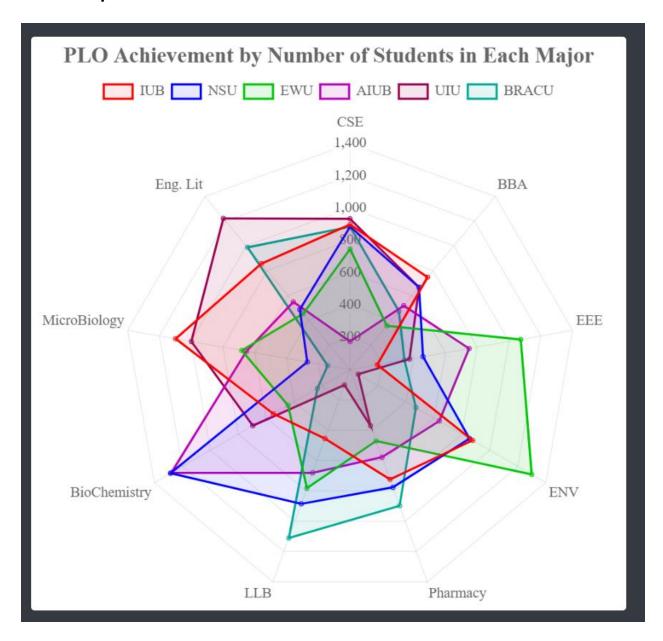
Student Dashboard:



Student-Wise PLO Achievement Table:

PLOs			Courses	
		CSE101	CSE203	CSE303
PLO1	Acheivement Status	Achieved	Achieved	Failed
PLOT	Percentage Achieved	89	75	33
PLO2	Acheivement Status	Achieved	Failed	Achieved
	Percentage Achieved	88	41	77
PLO3	Acheivement Status	Failed	Failed	Achieved
	Percentage Achieved	15	44	96
PLO4	Acheivement Status	Achieved	Achieved	Achieved
	Percentage Achieved	78	85	93
PLO5	Acheivement Status	Achieved	Failed	Failed
	Percentage Achieved	87	42	27
DLOC	Acheivement Status	Failed	Failed	Failed
PLO6	Percentage Achieved	24	45	39
DI O7	Acheivement Status	Failed	Achieved	Achieved
PLO7	Percentage Achieved	11	67	76
PLO8	Acheivement Status	N/A	N/A	N/A
	Percentage Achieved	N/A	N/A	N/A
DI OO	Acheivement Status	Failed	Failed	Achieved
PLO9	Percentage Achieved	33	09	65
	Acheivement Status	Achieved	Achieved	Achieved
PLO10	Percentage Achieved	66	85	77
PLO11	Acheivement Status	N/A	N/A	N/A
	Percentage Achieved	N/A	N/A	N/A
PLO12	Acheivement Status	Achieved	Failed	Failed

University Wise PLO ANALYSIS:



```
SELECT AVG(TotalPlo.PLOpercentage) AS ActualPlo
FROM (

SELECT (PLO / TotalComark * 100) AS PLOpercentage
FROM (

SELECT SUM(e.obtainedMarks) AS PLO, SUM(a.marks) AS

TotalCoMark

FROM performance_monitor_enrollment_t en,
```

```
performance_monitor_evaluation_t e,
    performance_monitor_assessment_t a,
    performance_monitor_co_t c,
    performance_monitor_plo_t p,
    performance_monitor_student_t st

WHERE st.department_id = '{}'

AND st.studentID = en.student_id

AND en.enrollmentID = e.enrollment-id

AND e.assessmentID = a.assessmentNo

AND a.coID = c.coID

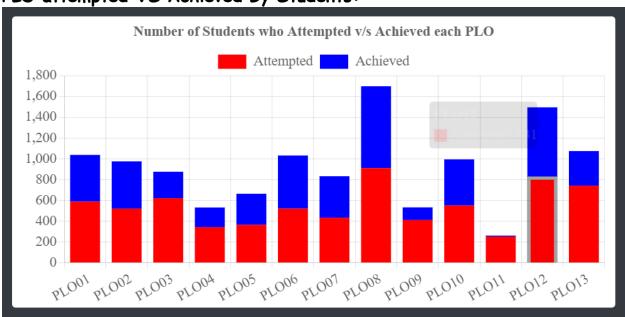
AND c.ploID = '{}'

GROUP BY en.sectionID

) ploPer

) TotalPlo;
```

PLO attempted VS Achieved By Students:

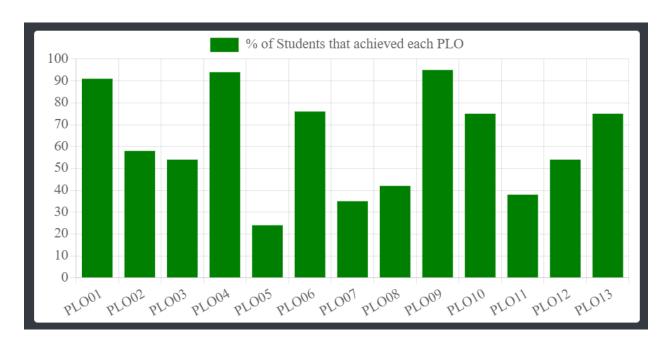


```
SELECT COUNT(TotalPlo.PLOpercentage) AS Acheive
        FROM (
               SELECT studentID, (PLO / TotalComark * 100) AS PLOpercentage
               FROM performance_monitor_plo_t p,
                   performance_monitor_co_t c,
                     SELECT en.studentID,c.plo_id,SUM(DISTINCT e.obtainedMarks)
AS PLO, SUM(DISTINCT a.marks)AS TotalCoMark
                     FROM performance_monitor_enrollment_t en,
                         performance_monitor_evaluation_t e,
                         performance_monitor_assessment_t a,
                        performance_monitor_co_t c,
                        performance_monitor_plo_t p,
                         performance_monitor_section_t s
                     WHERE en.studentID = '{}'
                     AND en.enrollmentID = e.enrollment_id
                         AND e.assessmentID = a.assessmentNo
                         AND a.coID = c.co_id
                         AND c.ploID = p.ploNo
                     GROUP BY studentID, p. ploNo
                  ) ploPer
               WHERE p.ploNo = ploPer.ploID
            GROUP BY studentID, ploNo
            HAVING PLOpercentage >=40
            ) TotalPlo
         GROUP BY studentID
```

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```
SELECT COUNT(TotalPlo.PLOpercentage) AS Acheive
         FROM (
               SELECT studentID, (PLO / TotalComark * 100) AS PLOpercentage
               FROM performance_monitor_plo_t p,
                  performance_monitor_co_t c,
                      SELECT en.studentID,c.plo_id,SUM(DISTINCT e.obtainedMarks)
AS PLO, SUM(DISTINCT a.marks)AS TotalCoMark
                      FROM performance_monitor_enrollment_t en,
                         performance_monitor_evaluation_t e,
                         performance_monitor_assessment_t a,
                         performance_monitor_co_t c,
                         performance_monitor_plo_t p,
                         performance_monitor_section_t s
                      WHERE en.student_id = '{}'
                      AND en.enrollmentID = e.enrollment_id
                         AND e.assessmentID = a.assessmentNo
                         AND a.coID = c.coID
                         AND c.ploID = p.ploNo
                      GROUP BY studentID, p.ploNo
                   ) ploPer
               WHERE p.ploNo = ploPer.ploID
            GROUP BY studentID, ploNo
            ) TotalPlo
```

COURSE WISE PLO ANALYSIS:



```
SELECT DISTINCT co.course_id, co.coNo, p.ploNo, (PLO / TotalComark * 100) AS
PLOpercentage

FROM Performance_monitor_plo_t p, mainapp_co_t co, (
SELECT DISTINCT c.course_id,c.coNo, c.plo_id, SUM(DISTINCT

e.obtainedMarks) AS PLO, SUM(DISTINCT a.marks) AS TotalCoMark

FROM Performance_monitor_enrollment_t en,
Performance_monitor_evaluation_t e,
Performance_monitor_assessment_t a,
Performance_monitor_co_t c,
Performance_monitor_plo_t p

GROUP BY en.section_id,c.plo_id

ORDER BY c.plo_id

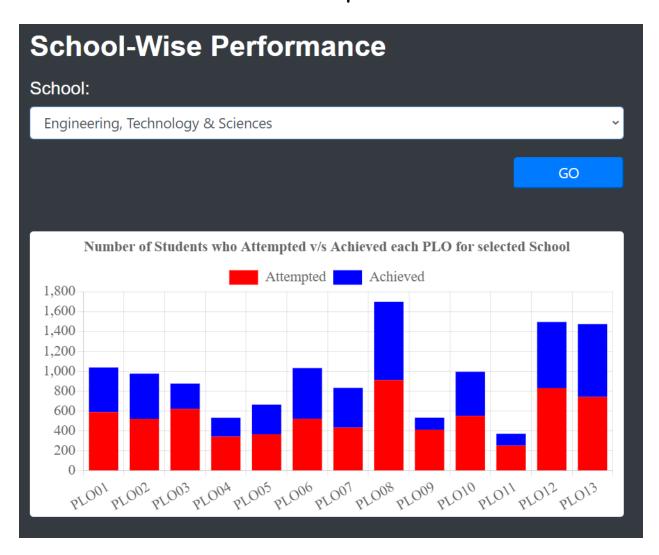
) ploPer

WHERE co.coNo = ploPer.coNo
```

AND p.ploNo = ploPer.plo_id

AND co.course_id = ploPer.course_id;

School-wise number of students attempted v/s achieved for each PLO:



CHAPTER 5

CONCLUSION

- PROBLEM AND SOLUTION
- ADDITIONAL FEATURES & FUTURE DEVELOPMENT
- CONCLUSION & RECOMMENDATIONS

PROBLEM AND SOLUTION

- The limited amount of mark sheets and information provided on students and faculties, we had to limit a lot of our calculations and work. If provided with more resources and data to work with, we believe we could have achieved a much reliable and accurate result, representation and prediction.
- The bounded timeframe of the semester has stalled our ability to achieve the full potential of this software. We believe we have created the best possible software from the limited resources and time provided, and hope to come up with improvements with better analysis when allowed more time.

ADDITIONAL FEATURES AND FUTURE DEVELOPMENT:

- The addition of an assessment page where faculties will be able to add marks for a specific assessment and fix the threshold for each question of a student throughout the term.
- Users will be expanded to also include advisors, where advisors will get relevant information about the students they're advising for improved and more beneficial interactions between students and advisors.
- The addition of Curriculum Page in the SPM where members of the Higher Management team can add and edit any changes to curriculum. Moreover, faculty members and students can check these updates to stay informed about the latest changes.

CONCLUSION AND RECOMMENDATIONS:

We believe that we have designed, built and implemented the best possible version of the idea we had for our SPM software. Through the proper usage of this software, we are hopeful to achieve a drastically improved quality of education that universities provide. This software is serviceable to students who want to improve themselves as better and more competent scholars, for faculties to keep better track of their students and improve their teaching methods accordingly, and for the members of the institution to better regulate their resources.