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CHAPTER 1: INTRODUCTION

BACKGROUND OF THE PROJECT

Our goal is to deliver a project that will design and build to help universities to promote a productive way for student performance monitoring system. We intend to provide a wholesome experience for students, faculties, head of departments and all the higher authorities. This application is a one-stop place for students to track their progress, for faculties to track course curriculum and all the higher authorities to monitor quality of education provided. We have added features to track students CGPA trend and sleeker way of workflow. This application gives the power to generate new student accounts much faster.

OBJECTIVE OF THE PROJECT

This project will be helpful for all user such as student vc dean head of department UGC spm admin and so on. This project will help student in future life and we can also learn how to implement a technology into our education.

SCOPE OF THE PROJECT

- Track school-wise, department-wise and program-wise student enrolment comparison

- School-wise, department-wise and program-wise student performance trends

- Course-wise student performance trends

- Instructor-wise student performance trends

- Track PLO achievements

- Problem analysis

- Data-collection and data sharing
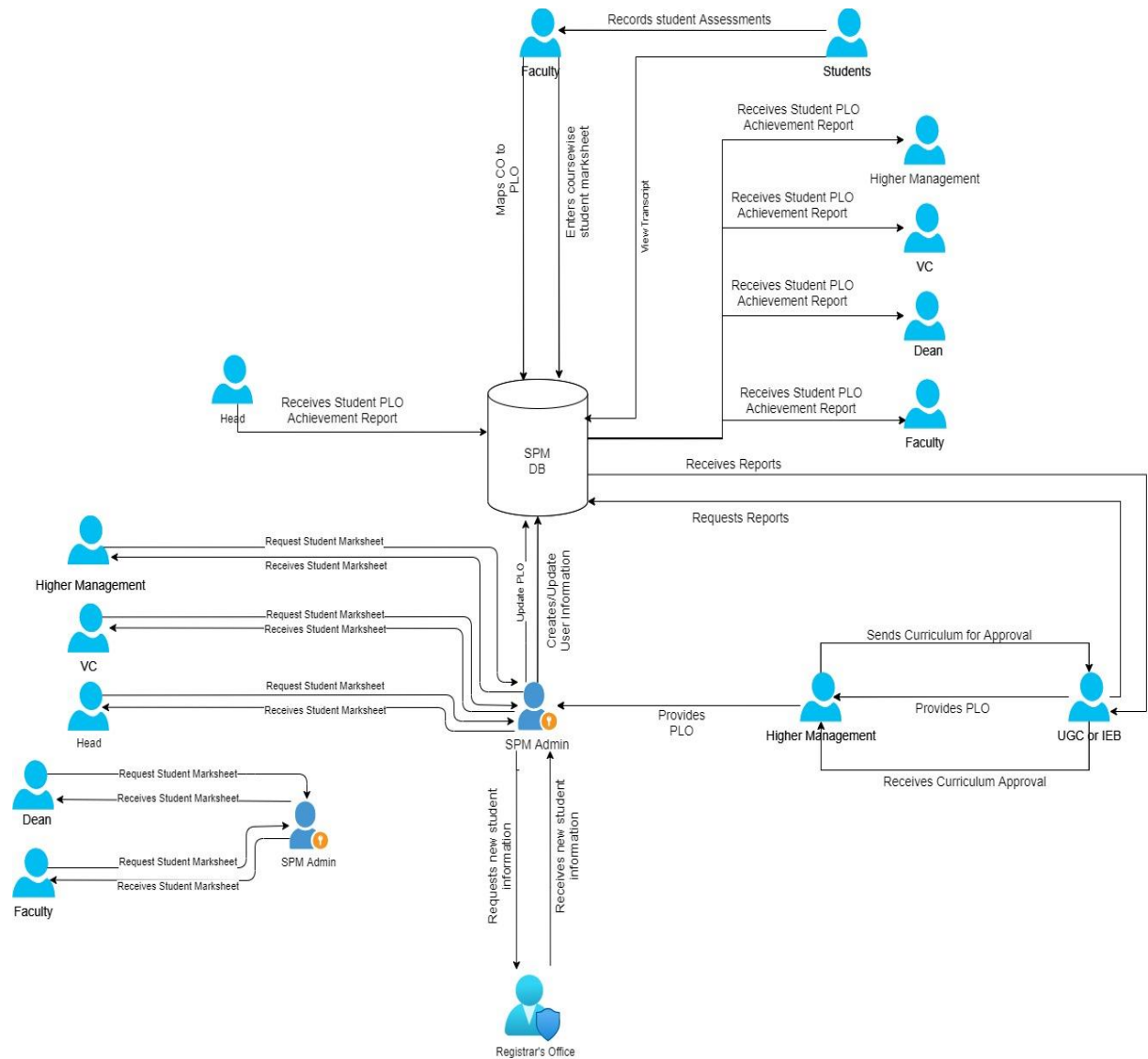
- Monitor project

- Team working

CHAPTER 2: REQUIREMENT ANALYSIS

RICH PICTURE (AS-IS)

Figure 2.1: Rich Picture (As-Is)

SIX ELEMENTS (AS-IS)

Process	System Roles					
	Human	Non-Comp Hardware	Computing Hardware	Software	Database	Network & Communication
Admin Creates or Modify User Account	**SPM Admin:** 1) Sends Request to Registrar's office for new students 2) Receives new student enrolment information from Registrar's office 3) Enters or updates student enrolment data to SPM Database **Registrar's Office:** 1) Re-	**Paper and Stationary:** Required to collect user information through forms for amendment **Folders** For storing forms or other necessary papers	**Computer:** 1) Used by SPM admin to send and/or receive new enrolment data from registrar's office 2) Used by SPM Admin to update or enter new user data 3) Used by registrar's office to receive and or send new user data **Database Server:** 1) SPM server to store student information 2) Registrar's office database from which new student data will be sent	**Operating System:** Used in Registrar's office and SPM office computers **SPM:** For which admin will create accounts **Office Suite:** To create or modify amendment forms or any other necessary documents	**RDBMS:** Used by SPM and Registrar's office database to store user or other data **Excel Files:** May be used to store user or other data	**Internet:** Used to access and store/modify data from registrar's office to SPM **Telephone:** Used for verbal communicate with registrar's office

	ceives SPM Admin re-quest for new enrol-ment 2) Sends new student enrol-ment infor-mation to SPM Admin		**Printer:** To print amend-ment forms or any necessary documents **Network-ing De-vice:** Used for internet access, internal da-tabase ac-cess or communi-ca-tional use			4

Process	System Roles					
	Human	Non-Comp Hard-ware	Compu-ting Hardware	Software	Database	Network & Communi-cation
View Student Marksheet/Transcript	**Higher Manage-ment:** 1)Request SPM admin for student marksheet 2) Receives student marksheet from SPM admin in excel format **VC:** 1)Request SPM admin for student marksheet 2) Receives student marksheet from SPM admin in excel format **Dean:** 1)Request SPM admin for student markshe	**Paper and Sta-tionary:** May be used to print marksheet or transcript **Folders** May be used for storing printed marksheet or transcript	**Comput-er:** 1) Used by SPM admin to receive request for marksheet/transcript and send them 2) Used by user to send request for marksheet/transcipt and receive them **Database Server:** 1) Store student marksheet **Printer:** May be used to print marksheet/transcript **Network-ing De-vice:** Used for internet access, internal database	**Operating System:** Used by users and SPM office computers **SPM:** 1) From where admin will retrieve student marksheet 2) Generate student transcript 3) Calculate CGPA **Excel Software:** To view or analyze student marksheet **PDF Viewer:** To view student transcript **Printing Software:** Used for computer to communicate with the printer	**RDBMS:** Used by SPM to store student marksheet **Excel Files:** Used to store student marksheet locally on computer harddisk	**Internet:** Used by users and SPM admin to communicate with each other for student marksheet/transcript **Tele-phone:** Used for verbal communicate with SPM admin

			access or communi-ca-tional use			
	et 2) Re-ceives student markshe et from SPM admin in excel format **Head of Depart-ment:** 1)Reques t SPM admin for student markshe et 2) Re-ceives student markshe et from SPM admin in excel format **Faculty:** 1)Reques t SPM admin for student markshe et 2) Re-ceives student markshe et from SPM admin in excel format **Student:**						

	1)Request SPM admin for their transcript or view CGPA 2) Receives their transcript from SPM admin in printable format **Admin:** 1) Receives user request for student marksheet/transcript 2) Send the user their required student marksheet/transcript				

Process	System Roles					
	Human	Non-Comp Hardware	Computing Hardware	Software	Database	Network & Communi-cation
Update PLO in SPM	**UGC/I EB:** Provides PLO to Higher Man-age-ment **Higher Man-age-ment:** Sends PLO to SPM Admin **SPM Ad-min:** Adds PLO to SPM	**Paper:** UGC/IEB may send PLO as printed form	**Computer:** 1) UGC/IEB may send PLO as printable format though email 2) Used by SPM Ad-min to up-date new PLO for faculties, head of department and dean. 3) Used by Higher Manage-ment to re-ceive PLO from UGC/IEB and send the new PLO to SPM ad-min **Database Server:** 1) SPM server to store PLO **Printer:** To print PLO **Network-ing De-**	**Operating System:** Used by users **SPM:** Through which the PLO will accessed **Office Suite:** To create or modify PLO **PDF Viewer:** To view PLO in PDF for-mat **Printing Software:** Used for computer to com-municate with the printer	**RDBMS:** Used by SPM to store PLO	**Internet:** Used to ac-cess and store PLO on SPM **Tele-phone:** Used for verbal communi-cate be-tween us-ers

		vice: Used for internet access, internal da-tabase ac-cess or communi-ca-tional use			

Process	System Roles					
	Human	Non-Comp Hard-ware	Computing Hardware	Software	Database	Network & Communi-cation
Update Curricul-um ac-cording to PLO and send it for UGC/IEB approval	**Facul-ty:** 1) View PLO from SPM 2) De-signs curricu-lum for a pro-gram/c ourse 3) Send new curricu-lum to head of depart-part-ment for ap-proval	**Paper and Sta-tionary:** Higher Manage-ment may send new curricu-lum in printed form	**Computer** 1) Higher Manage-ment may send PLO as printa-ble format though email to UGC/IEB 2) Used by SPM Ad-min to up-date new curriculum to SPM DB. 3) UGC/IEB may view new curric-ulum in on computer	**Operating System:** Used by users **SPM:** Through which the curriculum will be ac-cessed **Office Suite:** To create or modify curriculum **PDF Viewer:** To view curriculum in PDF format	**RDBMS:** Used by SPM to store cur-riculum	**Internet:** Used to ac-cess and store cur-riculum on SPM **Tele-phone:** Used for verbal communi-cate be-tween us-ers

Head of Department: 1) Receives new curriculum for approval 2) Sends to SPM Admin for storing the curriculum to SPM database **SPM Admin:** Stores the curriculum in database **Higher Management:** 1) Sends new curriculum to UGC/IEB for approval 2) Receives ap-		**Database Server:** 1) SPM server to store curriculum **Printer:** To print curriculum information **Networking Device:** Used for internet access, internal database access or communica-tional use	**Printing Software:** Used for computer to communicate with the printer		

	proval or de- nial of curricu- lum from UGC/IE B **UGC/IE B:** Re- ceives new curricu- lum, analyze and ap- ap- prove or deny				

Process	System Roles					
	Human	Non-Comp Hardware	Computing Hardware	Software	Database	Network & Communi-cation
Provide UGC/IEB Educatio-nal Re-ports	**SPM Ad-min:** 1) Re-ceive re-quest from UGC/IEB for depart-part-ment-wise or Uni-versity-wide educa-tion report 2) Pre-pare report as per re-quest from UGC/IEB and for-ward it to them **UGC/IEB:** 1) Re-quests for de-part-ment-wise or Uni-versity-	**Paper and Sta-tionary:** May send reports in printed format **Folders** For stor-ing the printed reports	**Computer:** 1) Used by SPM ad-min to re-ceive re-port re-quest from UGC/IEB, produce report for UGC/IEB and send it to them 2) Used by UGC/IEB members to send re-quest to SPM ad-min for re-port and receive it **Database Server:** 1) SPM server to store stu-dent marksheet **Printer** Used by SPM ad-min to print report **Network-ing De-vice:** Used for internet access, internal da-	**Operating System:** Used by SPM ad-min and UGC/IEB users **SPM:** From which stu-dent marksheet s are re-trieved **Office Suite:** To view, create or modify student reports **Email Cli-ent:** 1) Used by UGC/IEB to send request for and re-ceive stu-dent re-ports 2) Used by SPM ad-min to re-ceive re-quest from and send report to UGC/IEB	**RDBMS:** Used by SPM da-tabase to store stu-dent markshee t **Excel Files:** May be used to store markshee t in excel format	**Internet:** 1) Used to access and store/modif y data stu-dent marksheet from SPM database 2) Com-municate between SPM admin and UGC/IEB **Tele-phone:** Used for verbal communi-cate be-tween SPM admin and UGC/IEB

	wide educa-tional report 2) Re-ceive the re-quest-ed re-port from SPM admin		tabase ac-cess or communi-ca-tional use			13

Process	System Report					
	Human	Non-computing Hardware	Computing Hardware	Software	Database	Internet & Communication
Student assesssessment according to CO	**Faculty:** 1) Retrieve COs from SPM 2) Monitor student performance according to the COs 3) Creates assignment and exam paper according to the COs 4) Sets schedule and destination for exam 5) Conducts exam and collects test paper 6) Check assignment and exam pa-	**Pen, Paper and Stationaries:** 1) May be used by faculties to prepare handwritten lecture outline, assignments and exam paper 2) Used by students to take notes, solve assignment and exam problems 3) To take student attendance manually **Clock:** For tracking time during class and exam **Classroom:** To con-	**Computer:** 1) May be used by faculties to prepare typed lecture outline, assignments and exam paper 2) Used by students to prepare typed assignment 3) Used by both faculties and student to conduct classes and exams	**Operating System:** Used by both faculties and students to operate their computer **IRAs:** For student attendence **Office Suite:** To type lecture notes, exam papers and assignments **Google Classroom and Google Meet:** For online classes **Google Form:** For online exams **Printing Software:** Used for computer to communicate with the	**RDBMS:** 1) Used by SPM to store student marksheets and other assessments 2) Used by IRAs for student attendence **Excel Software:** Used by faculties to store student marksheet locally	**Internet:** 1) Used to access and store/modify student marksheet from SPM database 2) Submit student attendance on IRAs 3) Communicate between faculties and students **Telephone:** Used for verbal communicate between faculties and students

	pers of each students and submits marksheet on SPM	duct classes and exams		printer		
	Student: 1) Participates in class discussion 2) Solves assigned problems and submits them on time 3) Takes exams and submits			**Email Client:** May be used for communication between faculties and students and to send assignments		

Process	System Report					
	Human	Non-computing Hardware	Computing Hardware	Software	Database	Internet & Communication
Retrieve PLO and map corresponding CO	**Faculty:** 1) Gets the PLO and course list from SPM 2) Maps PLO to corresponding CO of a course 3) Submits the mapped PLO to SPM	**Pen and Paper:** 1) During discussion between faculties	**Computer:** 1) Used to view PLO from SPM 2) Submit PLO to SPM	**Operating System:** Used by faculties in their computer **SPM:** From where PLOs are retrieved and PLO-CO map submitted to **Email:** May be used for communication between	**RDBMS:** Used by SPM to store PLOs and PLO-CO mappings	**Internet:** Used to access the PLOs from and submit PLO-CO mappings to SPM **Telephone:** Used for verbal communicate between faculties

Process	System Report					
	Human	Non-computing Hard-ware	Compu-ting Hard-ware	Software	Data-base	Internet & Communi-cation
View PLO achieve ment re-port	**Students:** 1) They can view student-wise, de-partment-wise, course-wise PLO achieve-ment from dashboard 2) They can view their own course-wise PLO achieve-ment **Faculties:** Depart-ment-wise, course-wise and student-wise PLO achieve-ment re-ports **Higher Manage-ment:** Depart-ment-wise, course-wise and student-wise PLO	**Pen and Paper:** To keep note of any PLO achieve ment re-ports	Comput-er**:** Used to view PLO achieve ment re-ports	**Opera-tion System:** Used by each of the users to oper-ate their computer **SPM:** To view PLO achieve ment re-ports	**RDBMS:** Used by SPM to store PLO achieve ment re-port	**Internet:** To access PLO report from SPM

	achieve-ment re-ports					

PROCESS DIAGRAM (AS-IS)
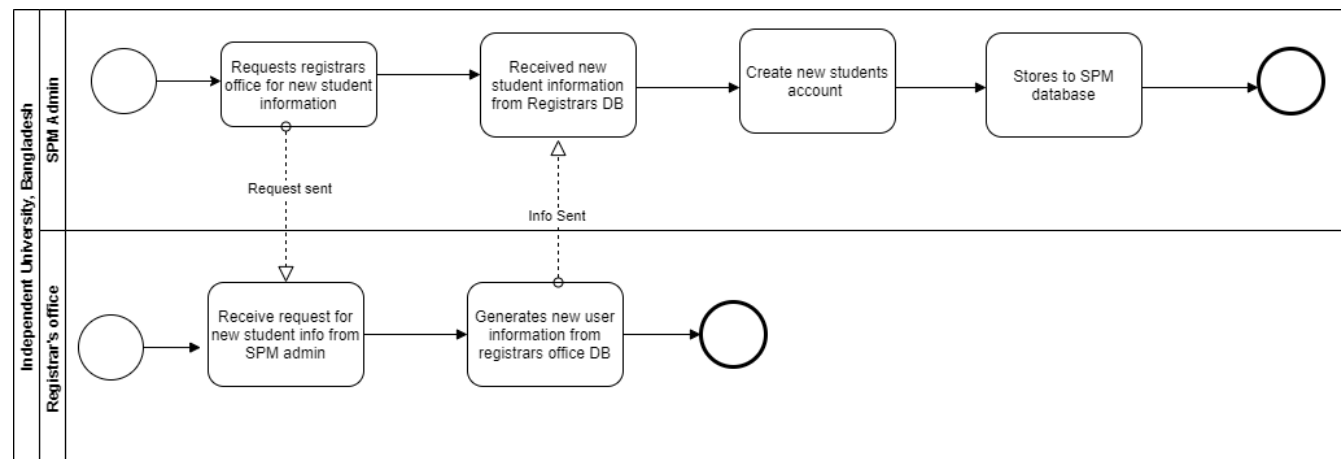
Figure 2.2: Process Diagram for Admin Creates or Modify User Account
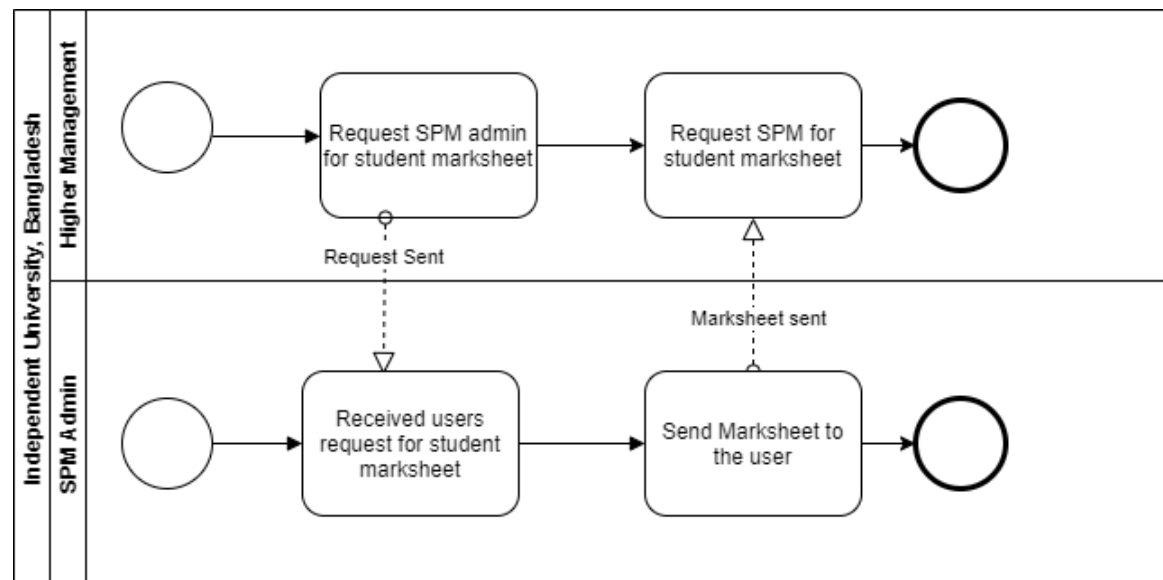
Figure 2.3: Process Diagram for View Student Marksheet by HM
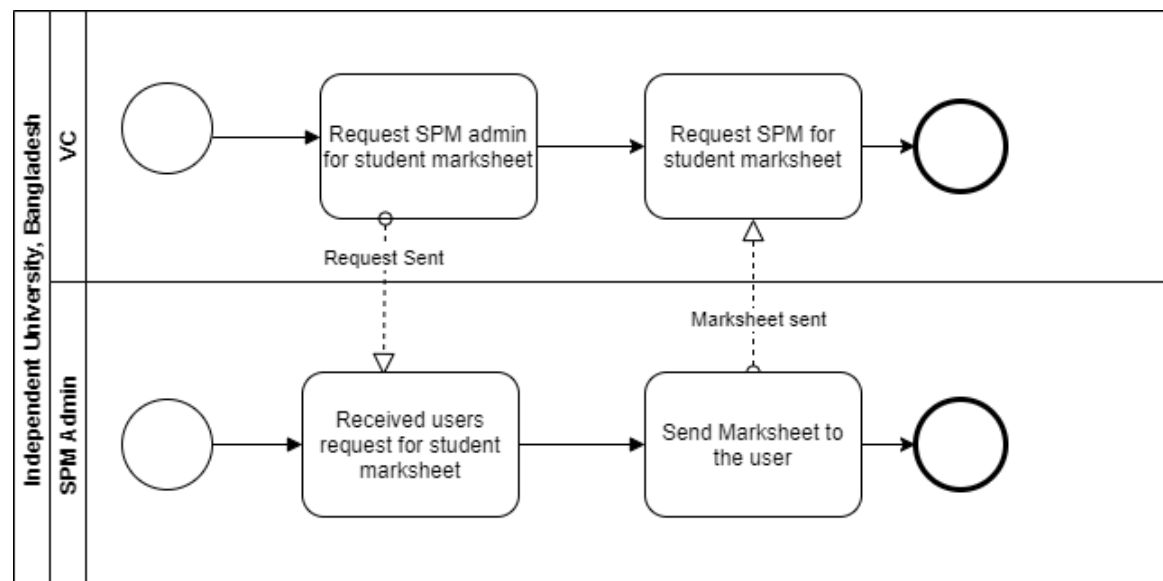
Figure 2.4: Process Diagram for View Student Marksheet by VC

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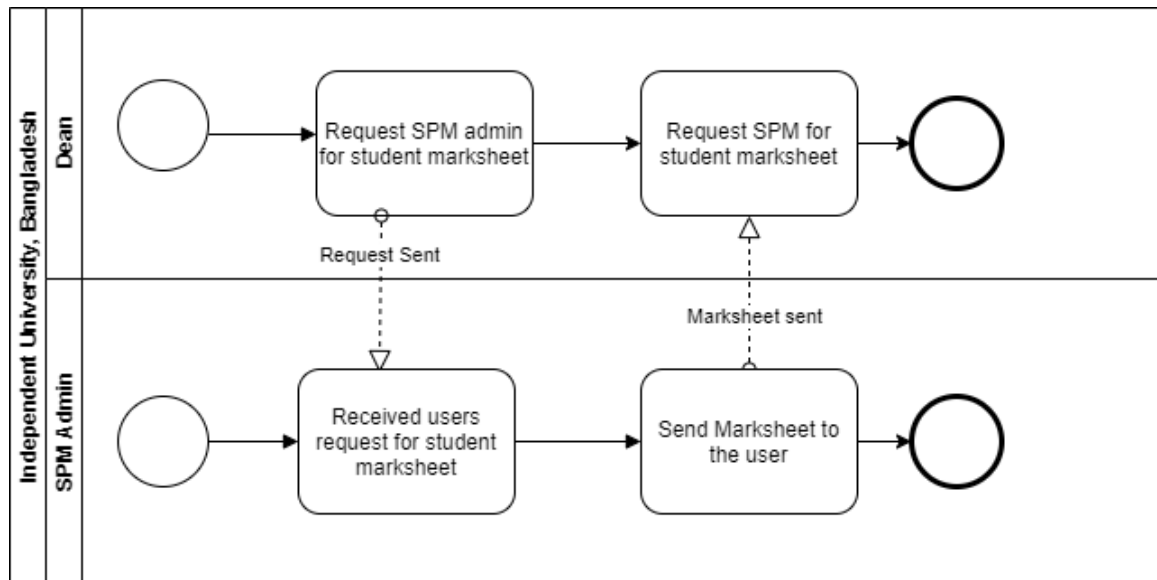
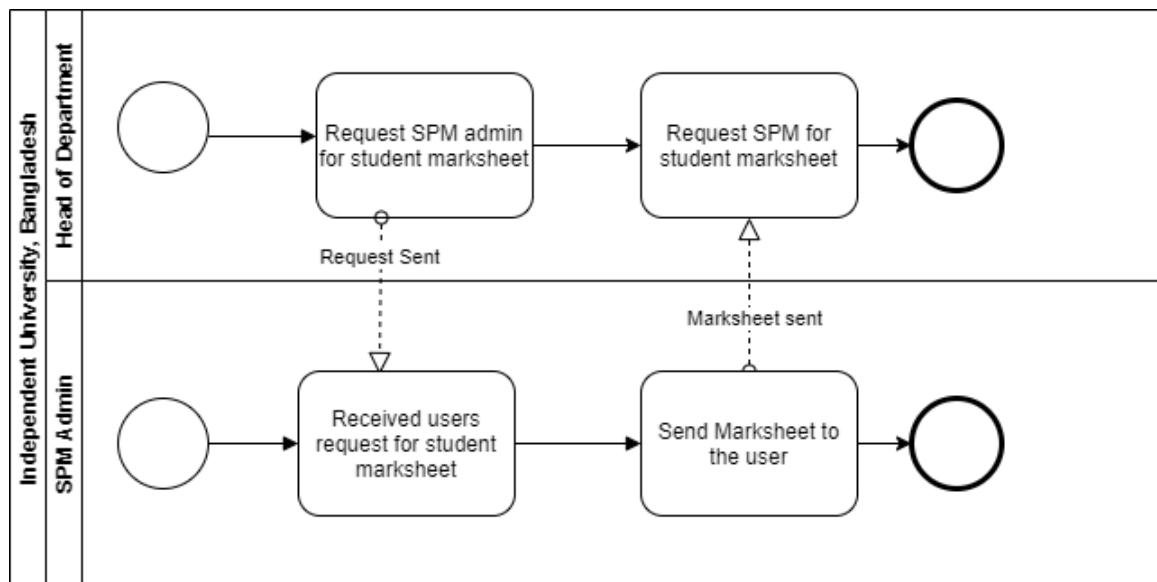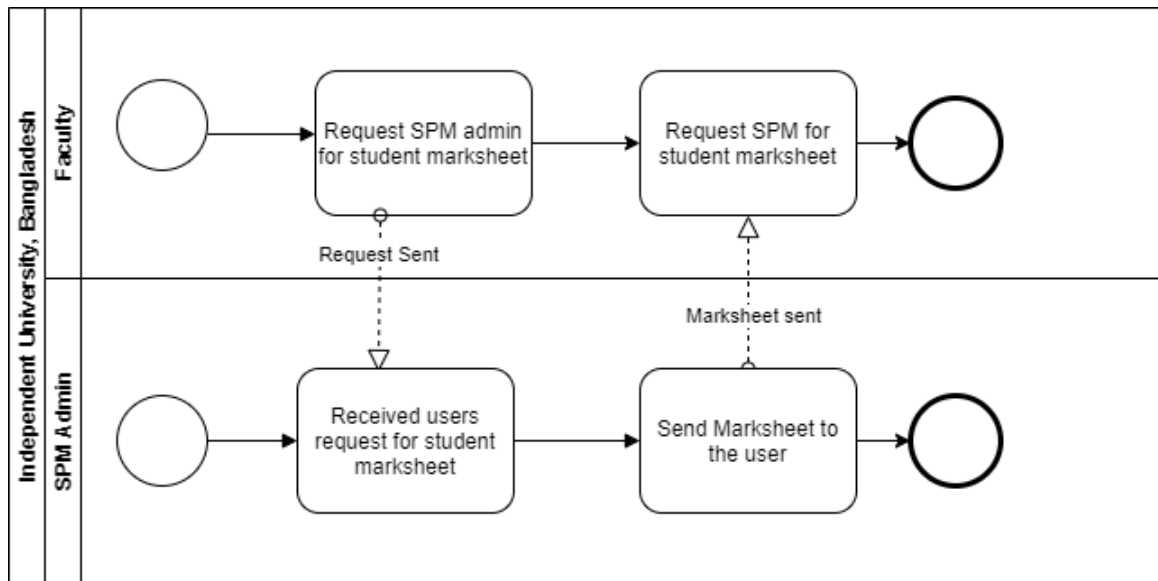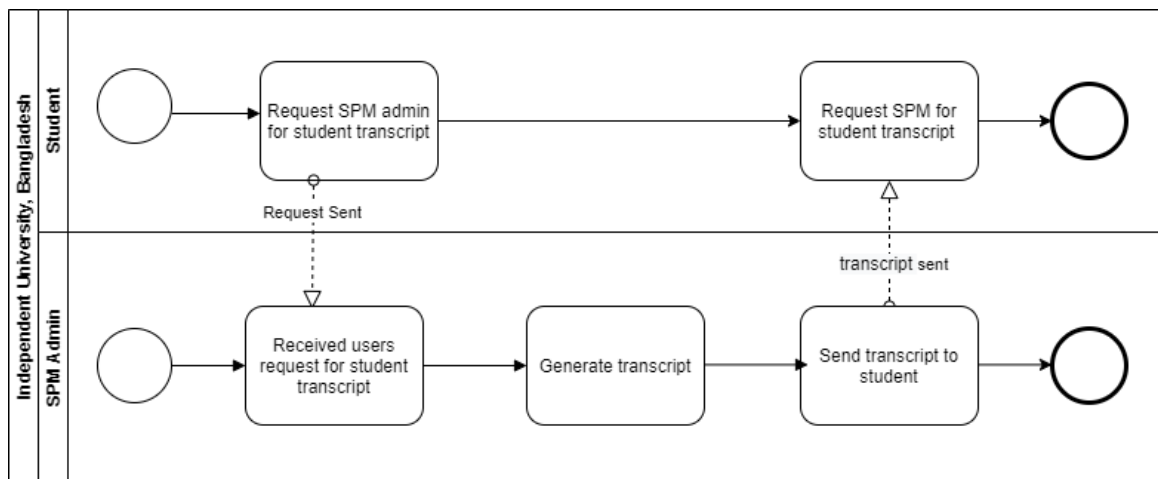**Figure 2.5: Process Diagram for View Student Marksheet by Dean**

Figure 2.6: Process Diagram for View Student Marksheet by Heaad of department

Figure 2.7: Process Diagram for View Student Marksheet by Faculty

Figure 2.8: Process Diagram for View Student Marksheet by Student
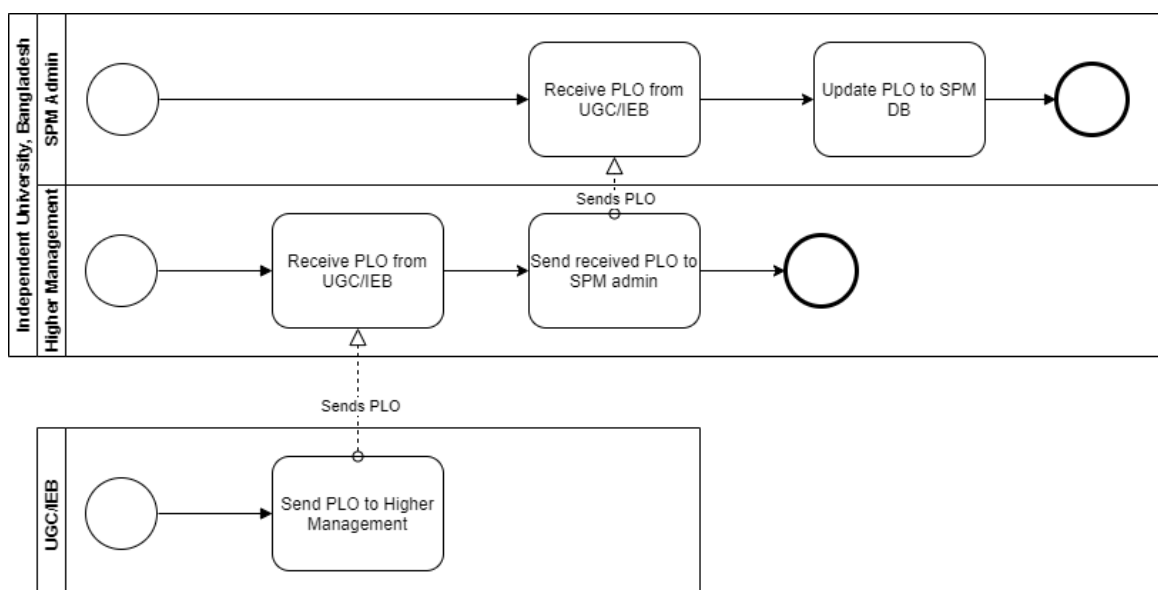
Figure 2.9: Process Diagram for Update Plo in Spm
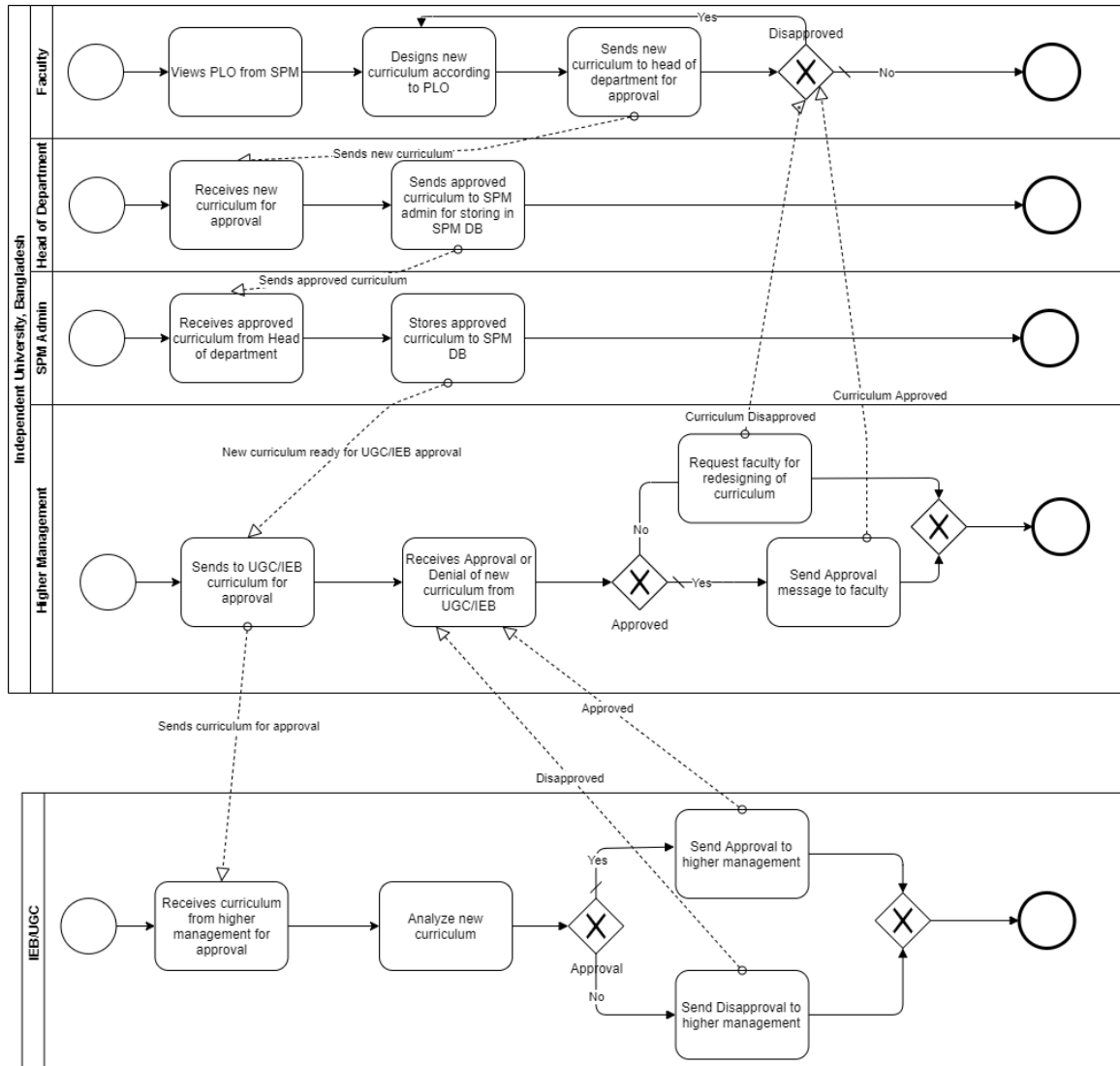
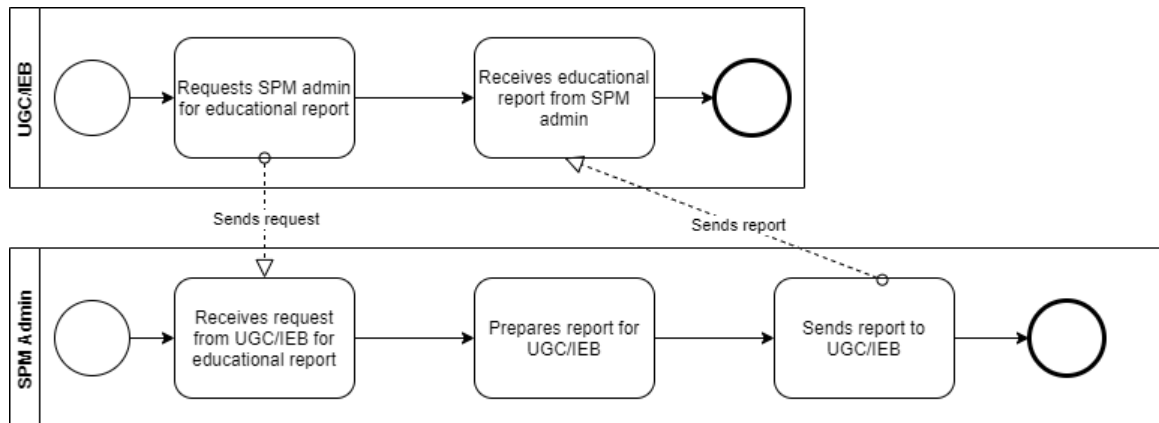**Figure 2.10: Process Diagram for Update Curriculum according to PLO and send it for UGC/IEB approval.**

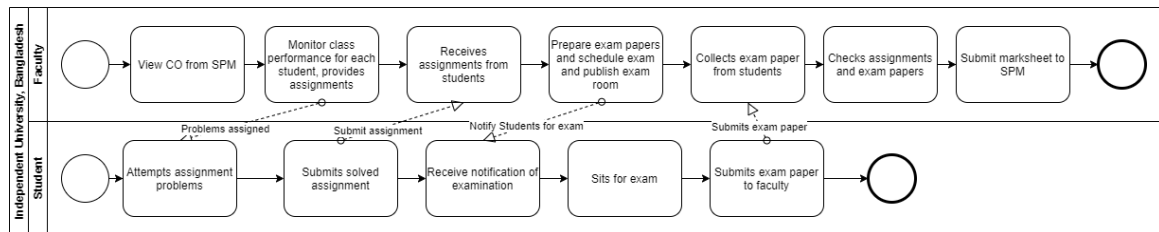**Figure 2.11: Process Diagram for Provide UGC/IEB Educational Reports**

Figure 2.12: Process diagram for Student assessment according to CO
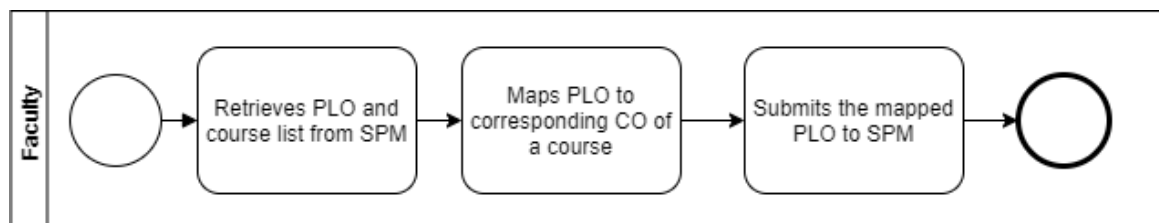

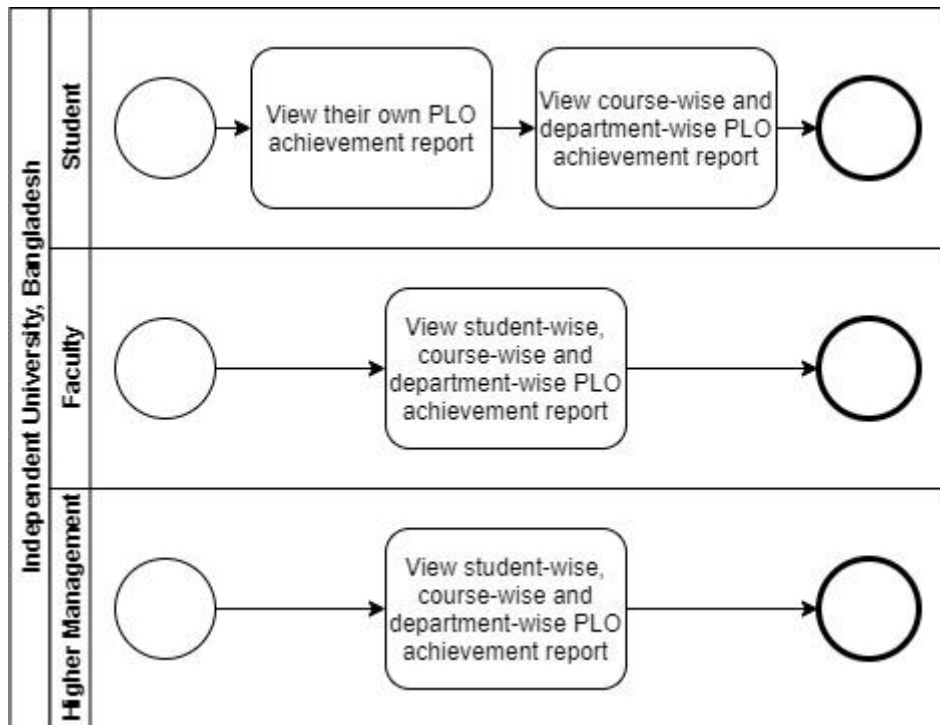**Figure 2.13: Process diagram for Retrieve PLO and map corresponding CO**

Figure 2.14: Process diagram for view PLO achievement report

PROBLEM ANALYSIS

Process Name	stakeholder	Concerns (problem)	Analysis (reason of the problem)	Proposed Solution
View Student Marksheet	1. Higher Management, VC, Dean, Head of Department, Faculty	Stakeholders have to request SPM admin to send marksheet and SPM admin has to respond to their request.	SPM admin has to respond to stakeholders' request and provide them their desired marksheet one by one, which slightly time	We can allow the stakeholders to have direct access to the marksheets rather having to receive the marksheet from the admin. This

			consuming as admin might be busy doing other tasks. Also, users cannot view analysis or trends of marksheet and CGPA of students in the current system. So, they have to generate those themselves.	will save lot of time and reduce human involvement. We can also show the stakeholders trends of student performance and CGPA to better satisfy their need.
Admin Creates or Modify User Account	1. SPM admin	SPM admin has to request registrar's office for new student enrolment info	This process slightly time consuming as employees of registrar's office might be busy in serving new students in their registration process. This can waste a lot of time and mistake as some information might not be sent	To solve this problem, we can implement APIs to get new student info immediately after their registration, without the need for the employees of registrar's office to send them to SPM admin. By this, SPM admin will receive information automatically.
Provide UGC/IEB Educatio-nal Reports	1. UGC/IEB	In order get the reports in current system, UGC/IEB have to send request to SPM admin and wait for them to send the reports	This process also very time consuming as SPM admin might be busy in other tasks.	In order solve this problem, we can expose certain APIs through UGC/IEB will automatically receive educational report every semester.
Update PLO in SPM	1. UGC/IEB 2. Higher Management	In current system, higher management have to send the PLO, they	In this process, the need for involvement of SPM admin is unnecessary	We can eliminate the involvement of SPM admin by giving higher

		received from UGC/IEB, to SPM admin to update the PLO in the SPM DB	and increases human in-volvement	managements to update the PLO to SPM DB.

RICH PICTURE (TO-BE)

SIX ELEMENTS (TO-BE)

PROCESS DIAGRAM (TO-BE)

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