King Fahd University of Petroleum & Minerals

Department of Information Systems & Operations Management
Mis301

Team#3:

Project title: Registration system for Dammam Community College

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Information System and Operation Management Department, King Fahd University of Petroleum and Minerals

MIS 301: Systems Analysis and Design

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D1.1 Description

Improving registration system for students at Dammam Community College to help the college administration system, the Student Registration & Admission Management module enables the college to handle the admission inquiries, track application status, centralize data management, develop efficient communication, and simplify time-consuming admission process with simplicity. We have worked as a group with the registrar MR. Ovais Khan of DCC in-person meeting, also we have communicated online with him. Utilizing this program, you may automate the admissions process to improve its effectiveness and efficiency. In their old system the most important thing for the user which is the UI was not that appealing, petitions were manual, there was no waitlist option to register courses, no added visual table of courses registered, also no CRNs to their sections and no documentation. The registration system is the backbone of every university or college, if it is not completed efficiently the whole system will collapse. An organized, efficient, and effective registration system for DCC is the target of our project, so students, the registration office and the college would benefit from it.

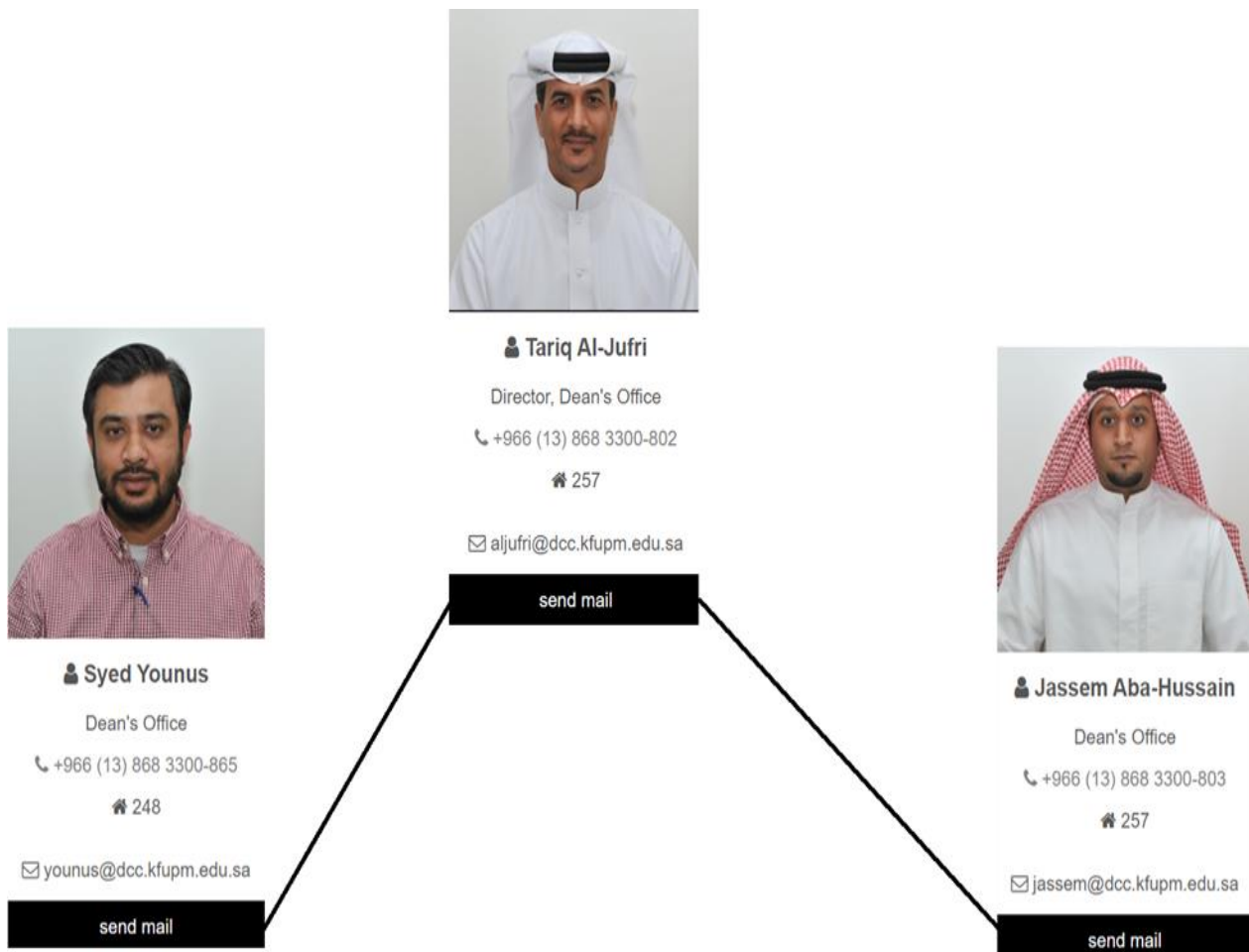# 1-Dean organizational Chart

Figure 1 (Dean organizational Chart)
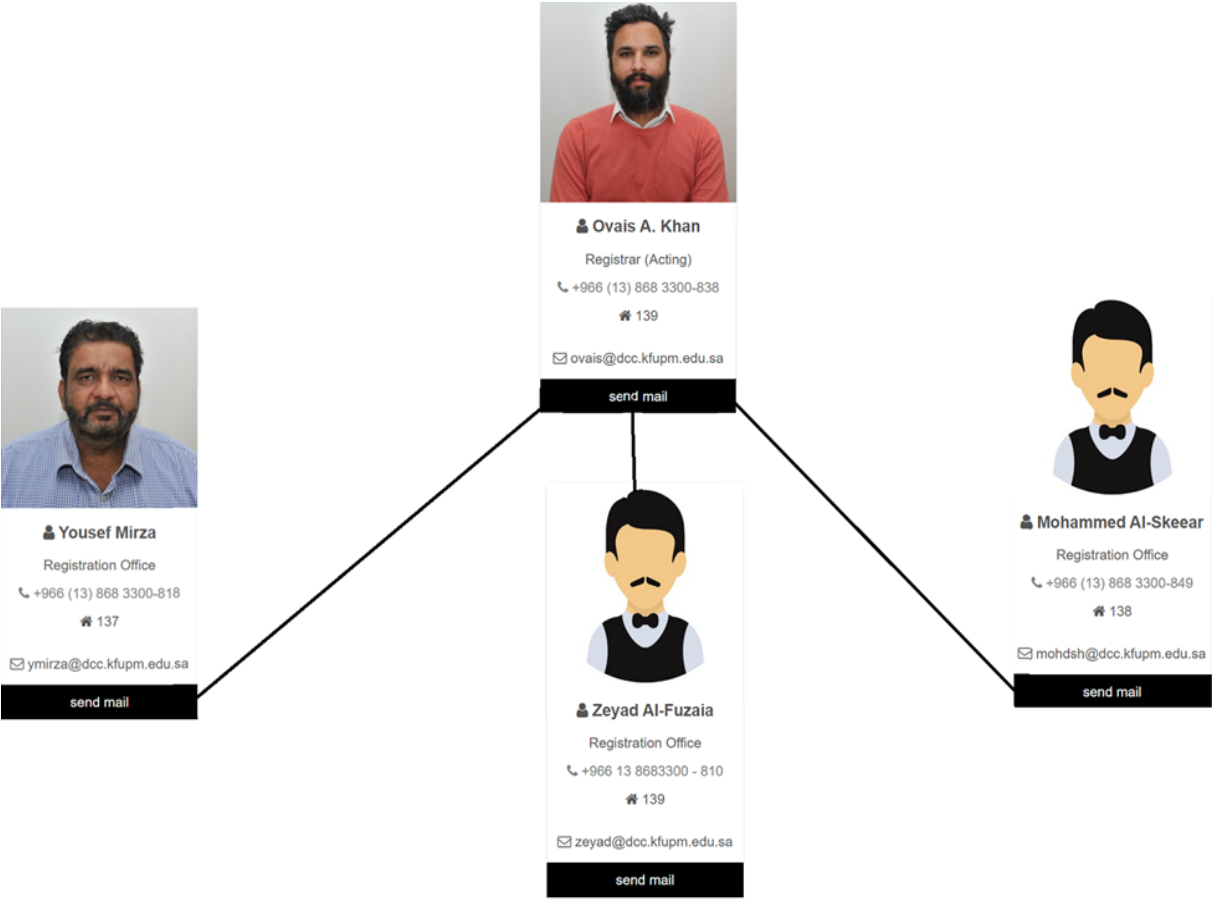
2-Registrar office Organizational chart

Figure 2 (Registrar office Organizational chart)

3-IT OFFICE ORGANIZITIONAL CHART

Figure 3 (IT OFFICE ORGANIZITIONAL CHART)

D1.3 Feasibility Analysis

Feasibility Analysis seeks to fairly and logically weigh the advantages and disadvantages of a current or proposed business, risks associated with the endeavor, the resources needed to carry out operations, and eventually the likelihood of success.

Technical Feasibility: Can we build it?	The college is familiar with the application and the technology because they have the database and a current system, and the purpose is to improve the system. The project size will be low due to the high familiarity, and it is easy to integrate with the current system.
Economic Feasibility: Should we build it?	The development cost will be low since it's just improving not building from scratch, the project cost will be for the development team and the software. Also, the operational cost will be for the maintenance and will be considered normal to the usual cost of the operational cost of the current system.
Organizational Feasibility: If we build it, will they come?	The project is highly aligned with the fundamental business system because it will upgrade the current system to achieve the enhancement. The project champion is highly supporting the project. The users who will benefit from the project are the administration, advisors, and students.

Recommendations	We recommend that the college proceeds to work on our system because it has a solid base that they can improve the registration system.

Cash Flow Diagram

Cash flow Diagram Visually depict the flow of income and outgoings over a period of time. A horizontal line with markers placed at various time intervals makes up the diagram. Costs and expenses are displayed as needed.

		2022	2023	2024	2025	2026	2027	Total
Benefits								
	decrease expenses		450000	430000	40000	30000	25000	
	Reduction in studeny complaint		70000	70000	700000	700000	700000	
	maintance costs		68000	68000	68000	68000	68000	
Total benefits		0	588000	568000	808000	798000	793000	3555000
Costs								
Development costs								
	2 servers @ 55000	110000	0	0	0	0	0	
	Software	34000	0	0	0	0	0	
	Server software	10000	0	0	0	0	0	
	Development labor	1236525	0	0	0	0	0	
Total development costs		1390525	0	0	0	0	0	
Operational costs								
	Hardware	0	5000	5000	5000	5000	3000	
	Software	0	20000	20000	20000	20000	20000	
	Operational labor	0	115000	119600	124384	12935		
Total operational costs			140000	144600	149384	37935	23000	
Total costs		1532295	185000	189600	194384	199359	179350	2479988
Net Cash Flow			-1532295	403000	378400	613616	598641	613650	1075012
Cumulative Net Cash Flow			-1532295	-1129295	-750895	-137279	461362	1075012	

Return on Investment (ROI	43%		
Break-even Point (BEP)	3.23 Years	For BEP Formula your Textbook	

		2022	2023	2024	2025	2026	2027	Total
Present Value Total Benef		0	523317.9	476903.8	640011.7	596312	559033.7	2795579
Present Value Total Costs	Compute the present value of the cash flows, using an interest rate of 6%.	1445561.32	164649.3	159191.8	153970.3	148972.6	126434.7	2198780
Net Present Value (NPV)		596798.9						

Recommendation: The project is economically viable(Complete) since the ROI is 43% (Complete) which is considered high(High/Low) ROI. The break-even point is

Figure 4 (Cash Flow Diagram)

Gantt Chart

Gantt Chart assist teams in properly allocating resources and scheduling work around deadlines. They are also used as another tool used by project planners to keep an overview on their initiatives. They show, among other things, how dependent tasks, milestones, and tasks with different start and end dates relate to one another.
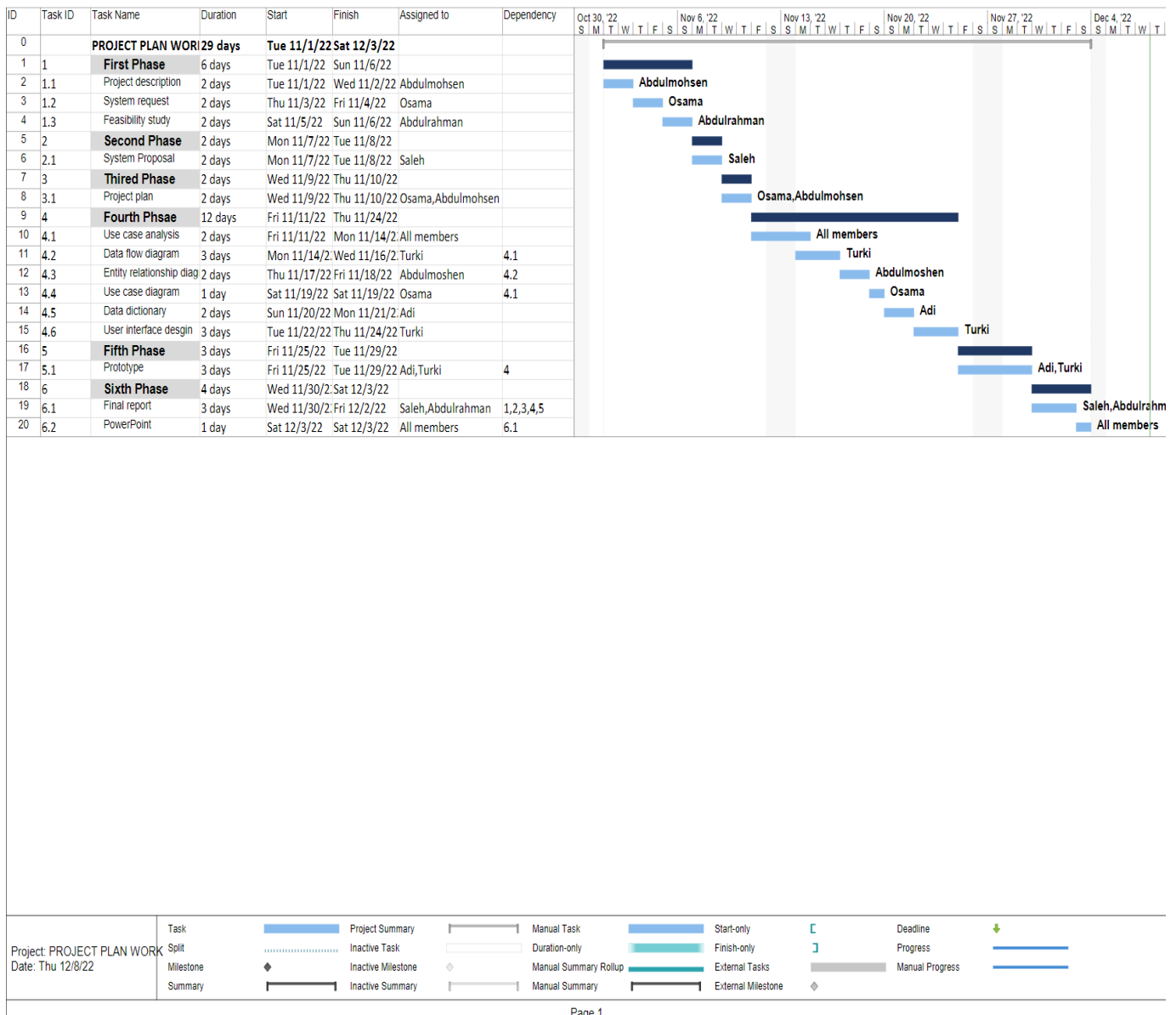
ID	Task ID	Task Name	Duration	Start	Finish	Assigned to	Dependency
0		PROJECT PLAN WORK	29 days	Tue 11/1/22	Sat 12/3/22		
1	1	**First Phase**	6 days	Tue 11/1/22	Sun 11/6/22		
2	1.1	Project description	2 days	Tue 11/1/22	Wed 11/2/22	Abdulmohsen	
3	1.2	System request	2 days	Thu 11/3/22	Fri 11/4/22	Osama	
4	1.3	Feasibility study	2 days	Sat 11/5/22	Sun 11/6/22	Abdulrahman	
5	2	**Second Phase**	2 days	Mon 11/7/22	Tue 11/8/22		
6	2.1	System Proposal	2 days	Mon 11/7/22	Tue 11/8/22	Saleh	
7	3	**Thired Phase**	2 days	Wed 11/9/22	Thu 11/10/22		
8	3.1	Project plan	2 days	Wed 11/9/22	Thu 11/10/22	Osama,Abdulmohsen	
9	4	**Fourth Phsae**	12 days	Fri 11/11/22	Thu 11/24/22		
10	4.1	Use case analysis	2 days	Fri 11/11/22	Mon 11/14/2	All members	
11	4.2	Data flow diagram	3 days	Mon 11/14/2	Wed 11/16/2	Turki	4.1
12	4.3	Entity relationship diag	2 days	Thu 11/17/22	Fri 11/18/22	Abdulmoshen	4.2
13	4.4	Use case diagram	1 day	Sat 11/19/22	Sat 11/19/22	Osama	4.1
14	4.5	Data dictionary	2 days	Sun 11/20/22	Mon 11/21/2	Adi	
15	4.6	User interface desgin	3 days	Tue 11/22/22	Thu 11/24/22	Turki	
16	5	**Fifth Phase**	3 days	Fri 11/25/22	Tue 11/29/22		
17	5.1	Prototype	3 days	Fri 11/25/22	Tue 11/29/22	Adi,Turki	4
18	6	**Sixth Phase**	4 days	Wed 11/30/2	Sat 12/3/22		
19	6.1	Final report	3 days	Wed 11/30/2	Fri 12/2/22	Saleh,Abdulrahman	1,2,3,4,5
20	6.2	PowerPoint	1 day	Sat 12/3/22	Sat 12/3/22	All members	6.1

Figure 5 (Gantt Chart)

D3.1 System proposal:

Project title: DCC Registration System

Project objectives:

Comparing a thorough online registration process to the "traditional" paper registration process, convenience and speed are the two most salient advantages. It is no longer necessary to manually fill out paper registration forms and mail them to a registration office thanks to online registration systems. The participants can easily register at their convenience and submit their information right away when using online registration tools. Without worrying about erasing or cutting, the participant can make any necessary adjustments. The participant's data will be loaded into a database right away. Adding the new features which are the improved user interface, and the online petition, Automated Registration processes and features, generating a visual schedule for the user, and improved documentation.

Comparison with Existing Similar Projects:

	Our system	Old system	KFUPM system	KSU system
Interface	medium	Very bad	good	Very good
Backend	good	bad	good	good
Reactive	medium	Very bad	bad	medium
Automated	good	bad	good	good

Added Value:

Student engagement in registration will increase while reducing the paperwork that is being done in the registrar office. The system will be easier to navigate more "Usable". Small details such as aesthetics are improved.

Stakeholders:

The most important stakeholder who have interest or concern in making the system better are the students, because they will interact with the system every semester. Advisors have also somewhat of a concern in the system being more efficient so they can finish their work on it faster and not to waist time on non-educational activities. Administration also has a stake in the system. Registration office plays the biggest rule on maintaining and presenting information from the system which they will have to document. DCC as a whole is a stakeholder in making this system operational, because as said before registration system is the backbone of every college or educational institution.

Targeted audience:

Students who are enrolled in the college and any user the interact with system, or anyone who interact with college.

Social Impact:

This strategy will ideally motivate more colleges to advance and encourage better websites. It will also support local growth and provide the kingdom a foothold in higher education while simultaneously competing with the big universities.

Additionally, we anticipate that the student will be more involved in the registration process.

D3.2 System Request

System request is a document that outlines the business objectives behind the development of a system and the predicted benefits it will bring. as well as list's the project's essential components.

System request - New Project
Project sponsor: (Job) Ovais Khan Dammam Community College (DCC)
Business Need: To enhance the current system while improving the students experience with Section registration with also Improving access to information for both the registration department and the whole college.
Business Requirements: Developing a modern interface to Automate the registration process, furthermore students can request a petition from the registration system and showing information about the Section for the students and faculty maintaining a useable (easy to use, easy to learn) system.
Business Value: Increase the number of participation students in the registration while reducing the delay which will be a result of Improving the simplicity of the system
Special Issues or Constraints: The limited time for finishing the project before the deadline (beginning of the next semester), also connecting the advisor with the system.

D4.1 Use Case Analysis

Use Case Analysis is the main method for acquiring use specifications for a new piece of software or project. Use case analysis' main objectives are to identify all externally visible behaviors, build a system from the user's point of view, and communicate system behavior in user terms.

Use Case Name: Register or Drop Section		ID: uc-1	Importance Level: High
Primary Actor: Student			
Short Description: a system to let the student register or drop their Section			
Trigger: Section to be added to the students or dropping unwanted Section Type: External			

Major Inputs:		Major Outputs:	
Description	Source:	Description	Destination
Student information	Student Database	Student information	Student Database
Section information	Section Database	Update database	Section Database
Register or drop request	Student		

Major Steps Performed	Information for Steps
1- The request for register or drop Section comes from the student.	1- Student GPA
	2- Student Load
	3- Student Status
2- The system registers or drops the Section.	4- Restriction
	5- Section information
3- System update student and Section databases.	6-Students schedule

Use Case Name: Electronic Petitions	ID: uc-4	Importance Level: Moderate
Primary Actor: Student		
Short Description: Students who had difficulties registering, would need approval to register		
Trigger: A student wanting to pass the restriction of a Section Type: External		

Major Inputs:		Major Outputs:	
Description		Description:	Destination:
Student Information	Student database	Send petition	Registrar Office
Request petition	Student	Update student	Student database
Section information	Section database	Update Section	Section database
E-Petition result	Registrar Office	Send rejected	Student

Major Steps Performed	Information for Steps
1- Student applies for e-petition	1- Section details
	2- Added Section entry
2- Student enters his information and the justification	3- Request Details
	4- Student Details
	5- request id number
3- The request goes to the registrar office to decide to accept or reject	6- petition type
4- If accepted the process will update the Section database and student database. If rejected the process will inform the student	

Use Case Name: Register Waitlist	ID: uc-3	Importance Level: High
Primary Actor: Student		
Short Description: A system to enroll a student when a Section is full seats and reserve a waiting seat until there is a free seat.		
Trigger: Students to enroll when the Section is full seats Type: External		

Major Inputs:		Major Outputs:	
Description	Source:	Description	Destination
Request waitlist	Student	Inform student	Student
Section information	Section Database	Update database	Section database

Major Steps Performed	Information for Steps
1- Students try to register a Section and find out that the Section are full seats 2- Students reserve a seat by registering the Section in the waitlist 3- If the Section seats got expanded the system will inform the student who is on the waitlist to register for the Section and reserve the seat for him in the system	1-Student information 2-Degree plan 3- Section information

Use Case Name: Create or Delete Section	ID: uc-2	Importance Level: High
Primary Actor: Registrar Office		
Short Description: Allows departments to add or delete sections		
Trigger: Department want to add or delete section Type: External		

Major Inputs:		Major Outputs:	
Description	Source	Description:	Destination
Section to be added or deleted	Registrar Office	Update database	Section Database

Major Steps Performed	Information for Steps
• The registrar receives the request of the creating or deletion of the section from the registrar office • The system creates or delete the section to the Section database	1- Section name 2- Section number 3- Section status 4- Section available seats/

D4.2 DFD: Data Flow Diagram

Data Flow Diagram is a graphical or visual representation that describes a business's operations through data movement using a standardized set of symbols and notations.

In formal methodologies like the Structured Systems Analysis and Design Method, they are frequently included.

Context Diagram:
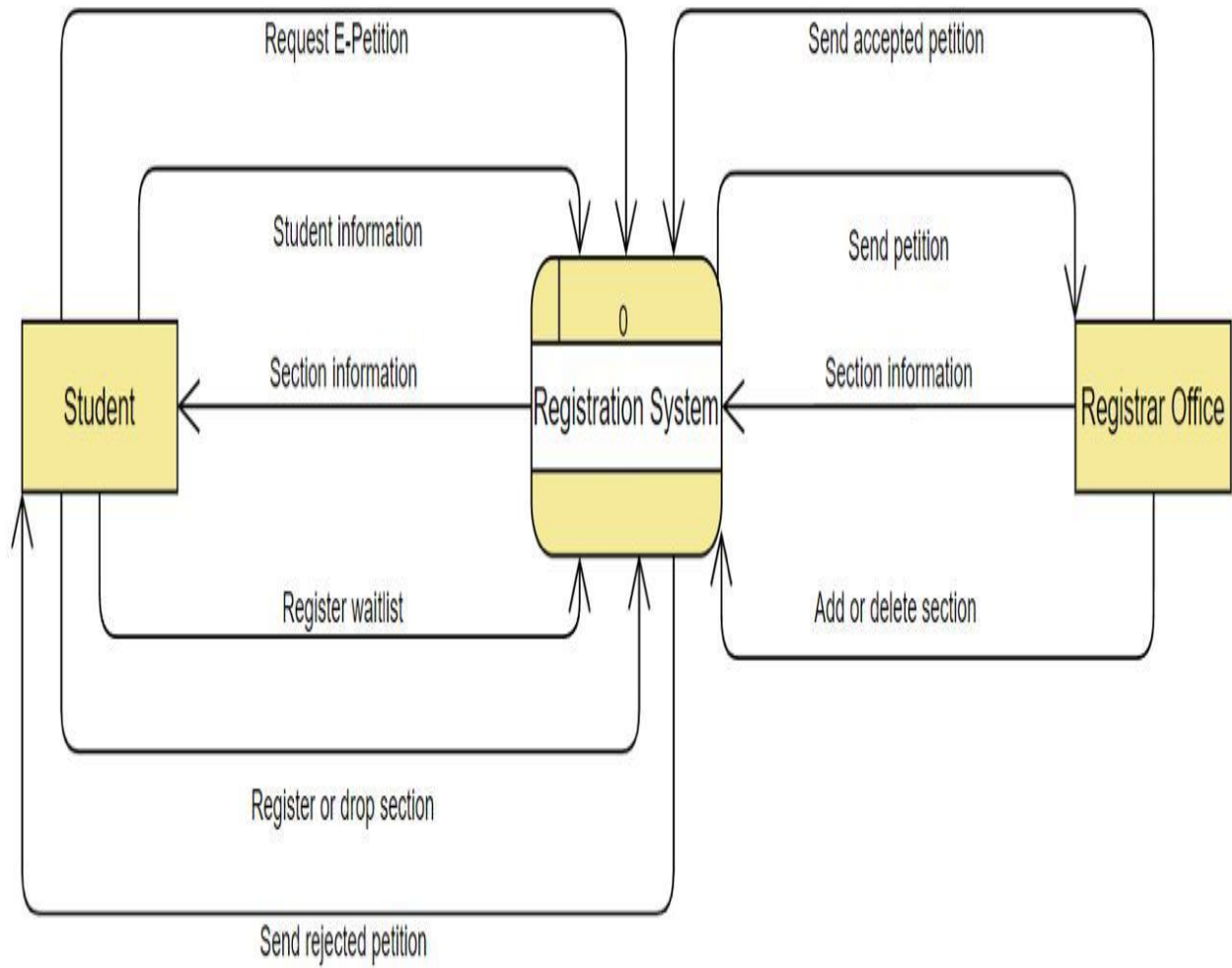
Figure 6 (Context Diagram)

Level 0:
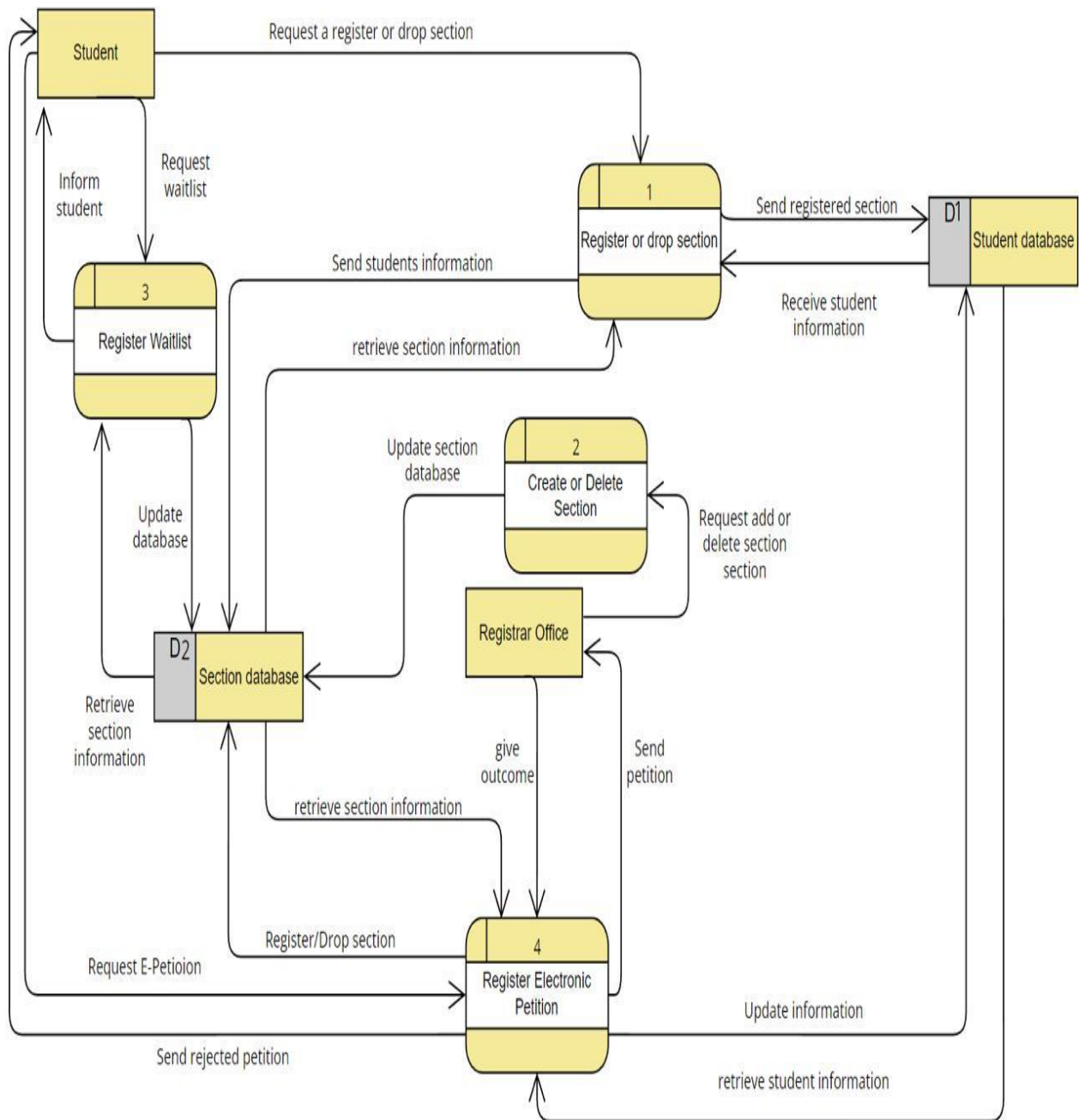
Figure 7 (Level 0)

Level 1:
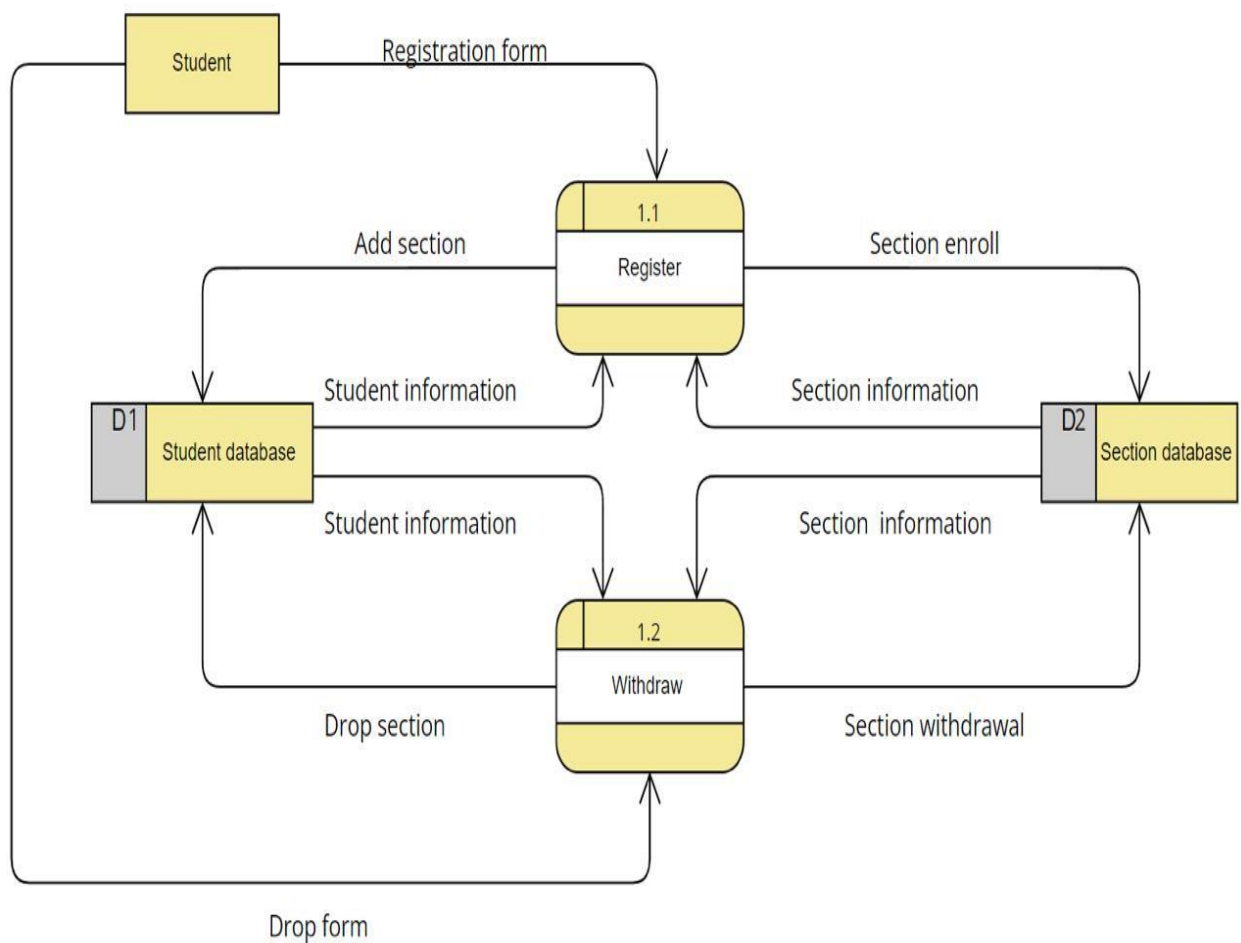
Figure 8 (level 1.1)
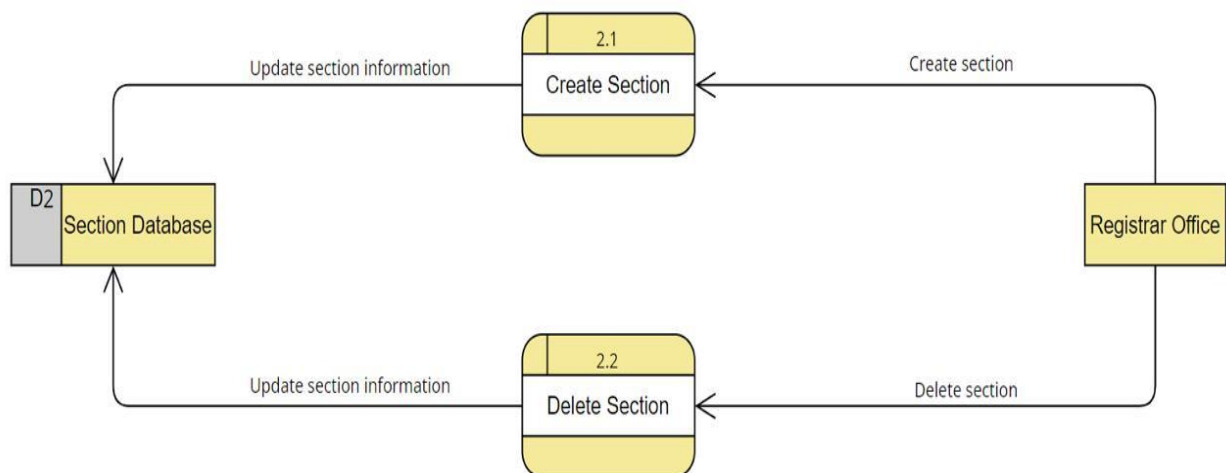
Figure 9 (Level 2.1)

D4.3 ERD: Entity relation diagram

Entity relation diagram refers to the databases' tables. Attributes, which are the traits or qualities that make up entities. A primary key, which identifies a singular attribute, or a foreign key, which can be applied to several attributes, are two ways to refer to an ERD attribute. The connections and interactions between those things.

1NF
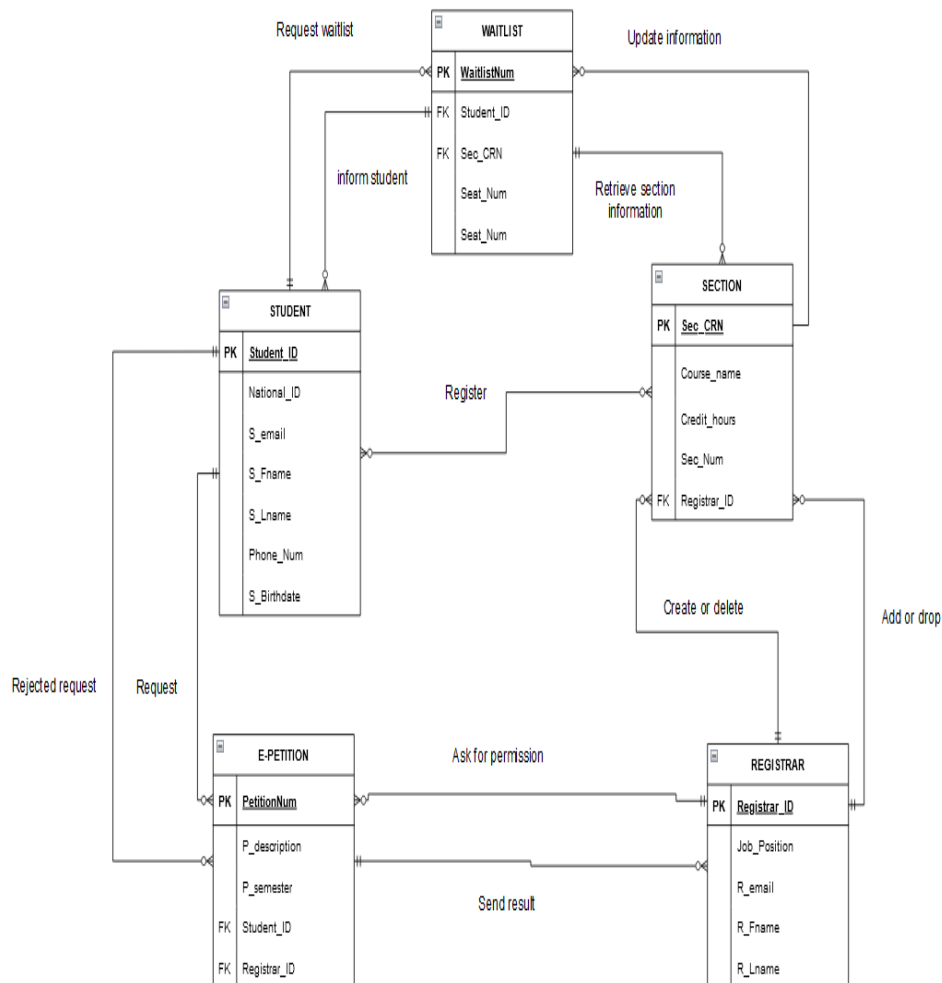
Figure 10 (ERD 1NF)

2NF

REGISTRAR Table:

Registrar_ID	Job_position	R_Email	R_Fname	R_Lname

Transitive dependency
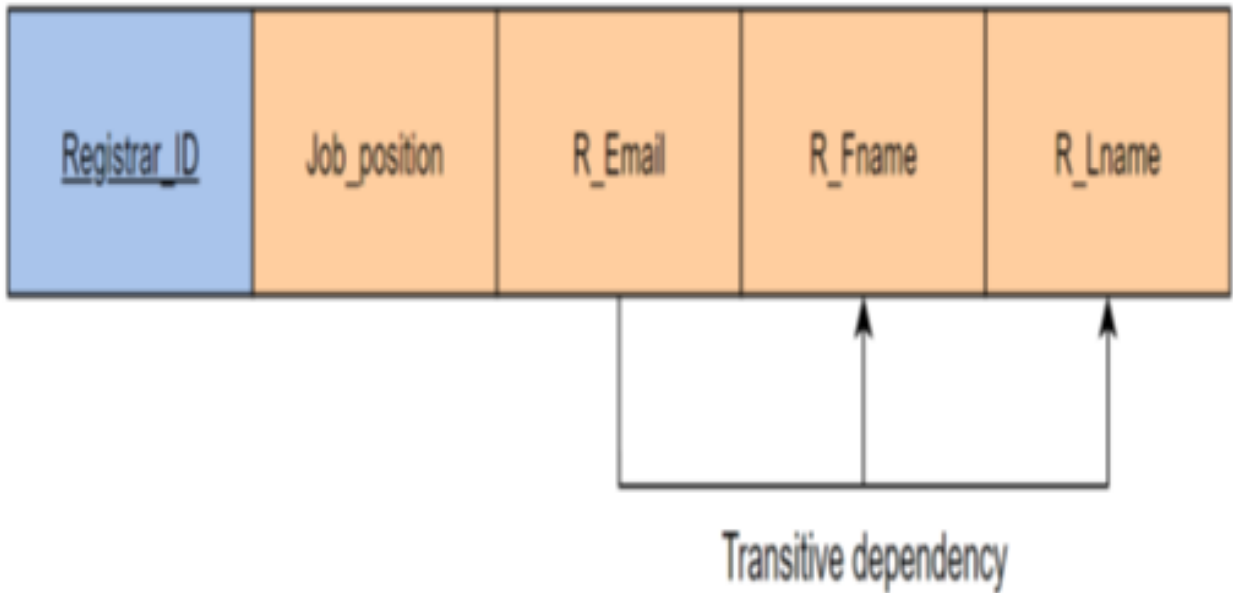
REGISTRAR INFORMATION Table:

R_Email	R_Fname	R_Lname
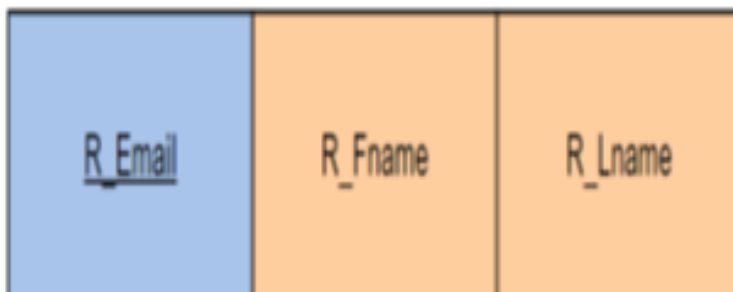
Figure 11 (2NF)

STUDENT Table

Transitive Dependency

Student_ID	National_ID	S_Fname	S_Lname	S_Birthdate	S_email
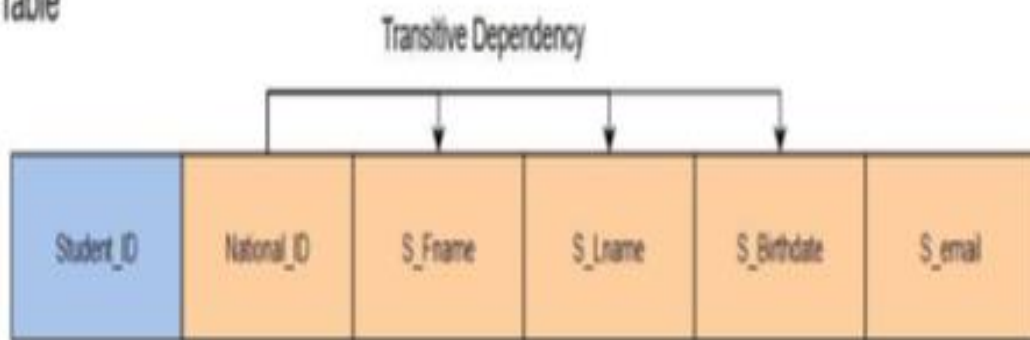
STUDENT INFORMATION Table

National_ID	S_Fname	S_Lname	S_Birthdate

3NF
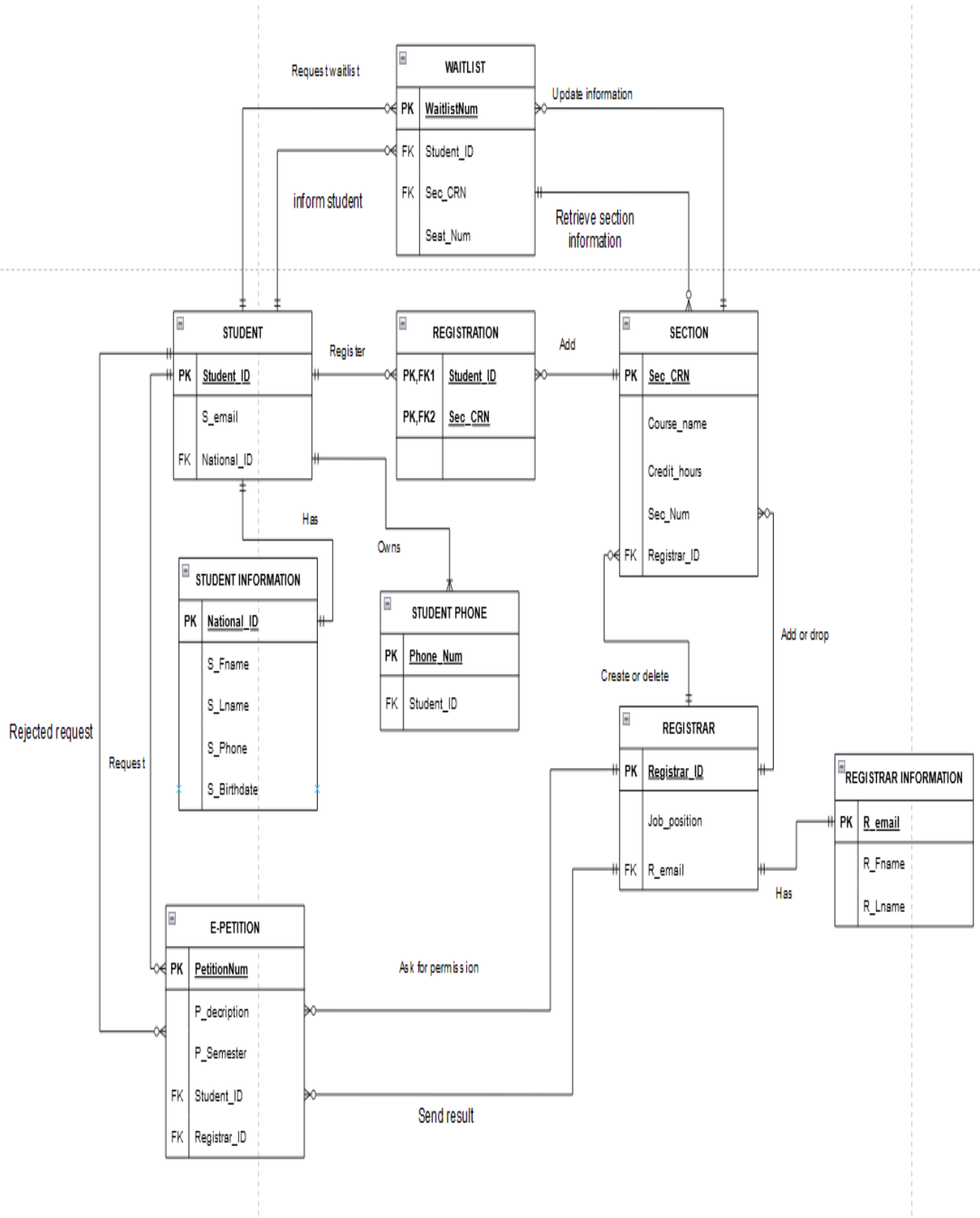
Figure 12 (3NF)

Business rule:

Business rules typically specify explicit guidelines or requirements for how certain routine tasks should be carried out.

Business regulations, for instance, could be:

a system for processing invoices that allows only particular managers to approve invoices up to a given amount.

1. Each STUDENT can request zero or many WAITLIST.

2. Each STUDENT can have zero or many SECTION.

3. A STUDENT can have one and only one NATIONAL ID.

4. Each STUDENT can request for zero or many E-PETITION.

5. Each STUDENT can be informed by zero or many WAITLIST.

6. Each STUDENT can be informed by zero or many E-PETITION.

7. Each WAITLIST belongs to one and only one STUDENT.

8. Each WAITLIST belongs to one and only one SECTION.

9. Each WAITLIST informs one and only one STUDENT.

10. Each WAITLIST receives information from one and only SECTION.

11. A NATIONAL ID belongs to one and only one STUDENT.

12. An E-PETITION belongs to one and only one STUDENT.

13. Each E-PETITION goes to one and only one REGISTRAR.

14. Each E-PETITION sends the rejection to one and only one STUDENT.

15. Each E-PETITION receives the result from one and only one REGISTRAR.

16. Each REGISTRAR can receive zero or many E-PETITION.

17. Each REGISTRAR can modify zero or many SECTION.

18. Each REGISTRAR can approve to add or drop a student from zero or many SECTION.

19. Each REGISTRAR can send the result to zero or many E-PETITION.

20. Each SECTION can have zero or many STUDENT.

21. Each SECTION can receive zero or many WAITLIST.

22. A SECTION modified by one and only one REGISTRAR.

23. A SECTION approves student by one and only one REGISTRAR.

24. Each SECTION can send information to zero or many WAITLIST.

D4.4 Use Case Diagram:

Use Case Diagram describe the system's main features and scope.

The interactions between the system and its actors are also depicted in these diagrams.

Utilize-case diagrams show what the system does and how the actors use it, but they do not show how the system works within.
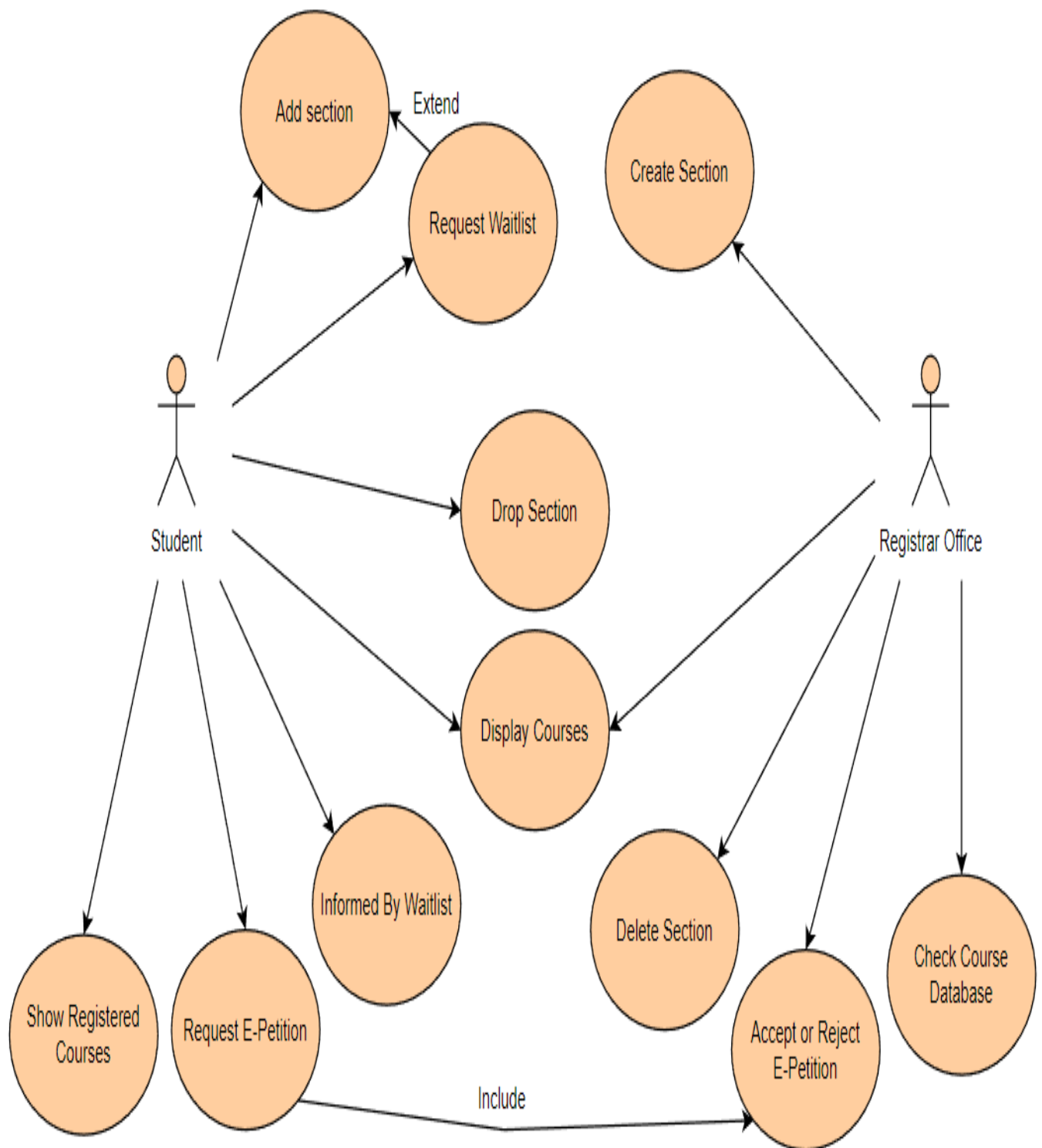
Figure 13 (Use Case Diagram)

D4.5 Data Dictionary

Data Dictionary is employed to describe and explain the organization and substance of data, and it gives accurate descriptions for each named data object.

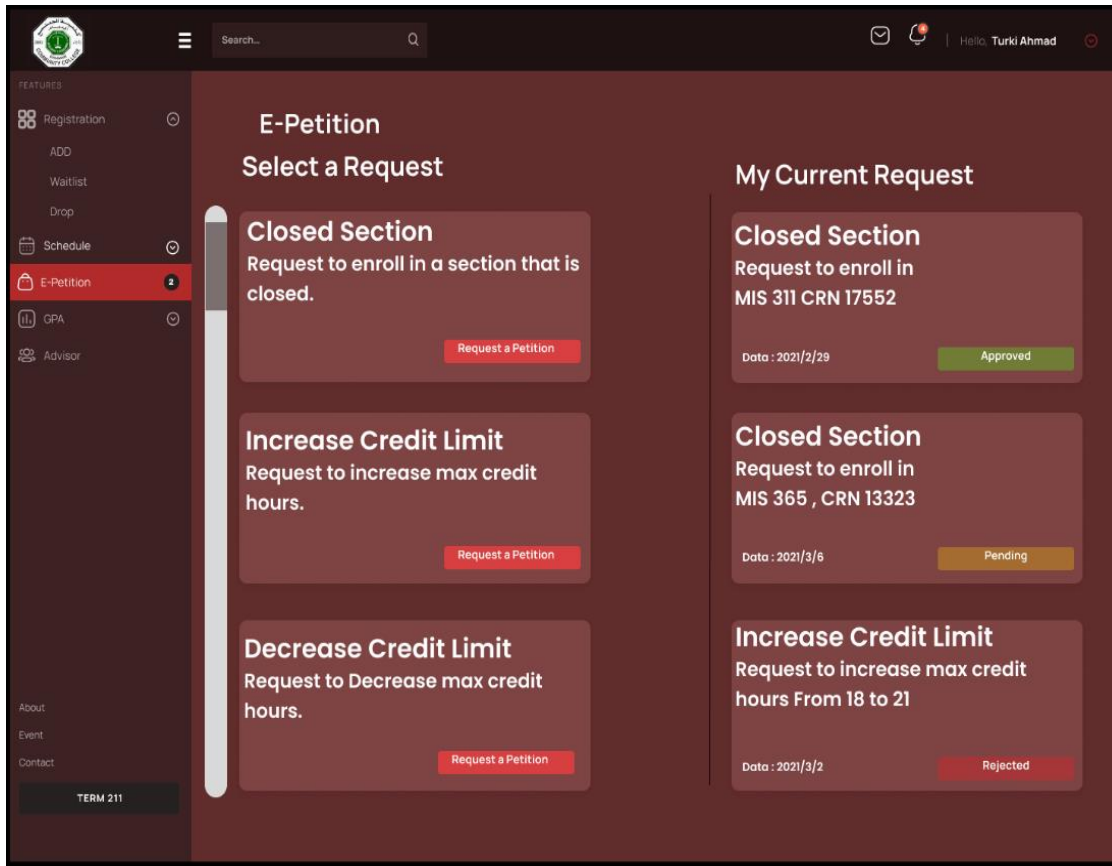| Entity Name/Table name	Entity definition	Attribute name	Definition	Data Type	Attribute type	Required value
REGISTRAR	A person who adds or drops sections and creates or deletes section	REGISTRAR_ID	Registrar's unique identifier	Number	Primary key	Yes
		Jop_position	Registrar job position	Character/text	Regular	Yes
		R_email	Registrar email	Character/text	Regular	Yes

Entity Name/Table name	Entity definition	Attribute name	Definition	Data Type	Attribute type	Required value
SECTION	A place where multiple student register to	SEC_CRN	Section's unique identifier	Number	Primary key	YES
		Course_name	Course name	Character/text	regular	YES
		Credit_hours	Course credit hours	Number	regular	YES
		Sec_num	Section number	Number	regular	YES
		Registrar_ID	Patient address	Number	Foreign key	YES

Entity Name/Table name	Entity definition	Attribute name	Definition	Data Type	Attribute type	Required value
Registrar information	Registrar personal information	R_email	Registrar information's unique identifier	Character/text	Primary key	YES
		R_Fname	Registrar first name	Character/text	regular	YES
		R_Lname	Registrar last name	Character/text	regular	YES

Entity Name/Table name	Entity definition	Attribute name	Definition	Data Type	Attribute type	Required value
Waitlist	A place where students take a number and wait in	WaitlistNum	Waitlist's unique identifier	Number	Primary key	YES
		Seat_Num	Number of the seat the student took	Number	Regular	YES
		SEC_CRN	Section's unique identifier	Number	Foreign key	YES

Entity Name/Table name	Entity definition	Attribute name	Definition	Data Type	Attribute type	Required value
Student phone	Student personal phone number	Phone_num	Student phone's unique identifier	Number	Primary key	Yes
		Student_ID	Student id number	Number	Foreign key	Yes

Entity Name/Table name	Entity definition	Attribute name	Definition	Data Type	Attribute type	Required value
Student	A person who attends DCC	Student_id	Student's unique identifier	Number	Primary key	Yes
		S_email	Student e_mail	Character/text	Regular	Yes
		National_ID	Student national id	Character/text	Foreign key	Yes

Entity Name/Table name	Entity definition	Attribute name	Definition	Data Type	Attribute type	Required value
Student information	Information about the student	National_id	Student's unique identifier	Number	Primary key	Yes
		S_Fname	Student first name	Character/text	Regular	Yes
		S_Lname	Student last name	Character/text	Regular	Yes
		S_birthdate	Student date of birth	Date	Regular	Yes

Entity Name/Table name	Entity definition	Attribute name	Definition	Data Type	Attribute type	Required value
E-petition	Student who create e-petition	PetitionNum	Petition's unique identifier	Number	Primary key	Yes
		P_description	Description of the petition request	Character/text	Regular	Yes
		P_semester	Term number	Character/text	Regular	Yes
		Student_id	Student unique id	Character/text	Regular	Yes
		Registrar_id	Registrar unique id	Character/text	Regular	Yes

Entity Name/Table name	Entity definition	Attribute name	Definition	Data Type	Attribute type	Required value
Registration	Associated table between section and student	Student_id	Foreign and primary key for registration	Number	Primary & foreign key	Yes
		Sec_CRN	Foreign and primary key for registration	Number	Primary & foreign key	Yes

D4.6 User interface design:

User interface design is employed to describe and explain the organization and substance of data, and it gives accurate descriptions for each named data object.

Request Petition (1):

Figure 14 (Request Petition)

Request Petition (2):

Figure 15 (Request Petition 2)

View Schedule:

Figure 16 (View Schedule)

Add/Drop Course

Figure 17 (Add/Drop Course)
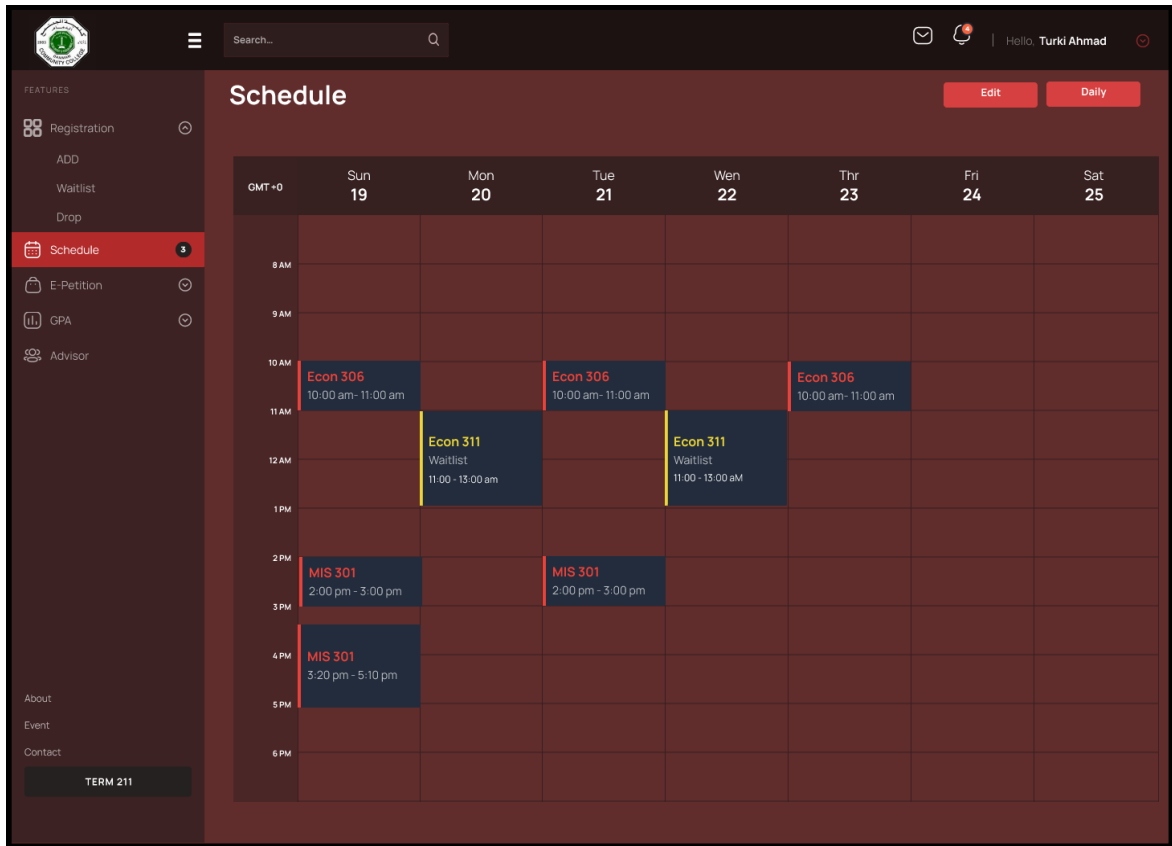
Dropped Course Econ301

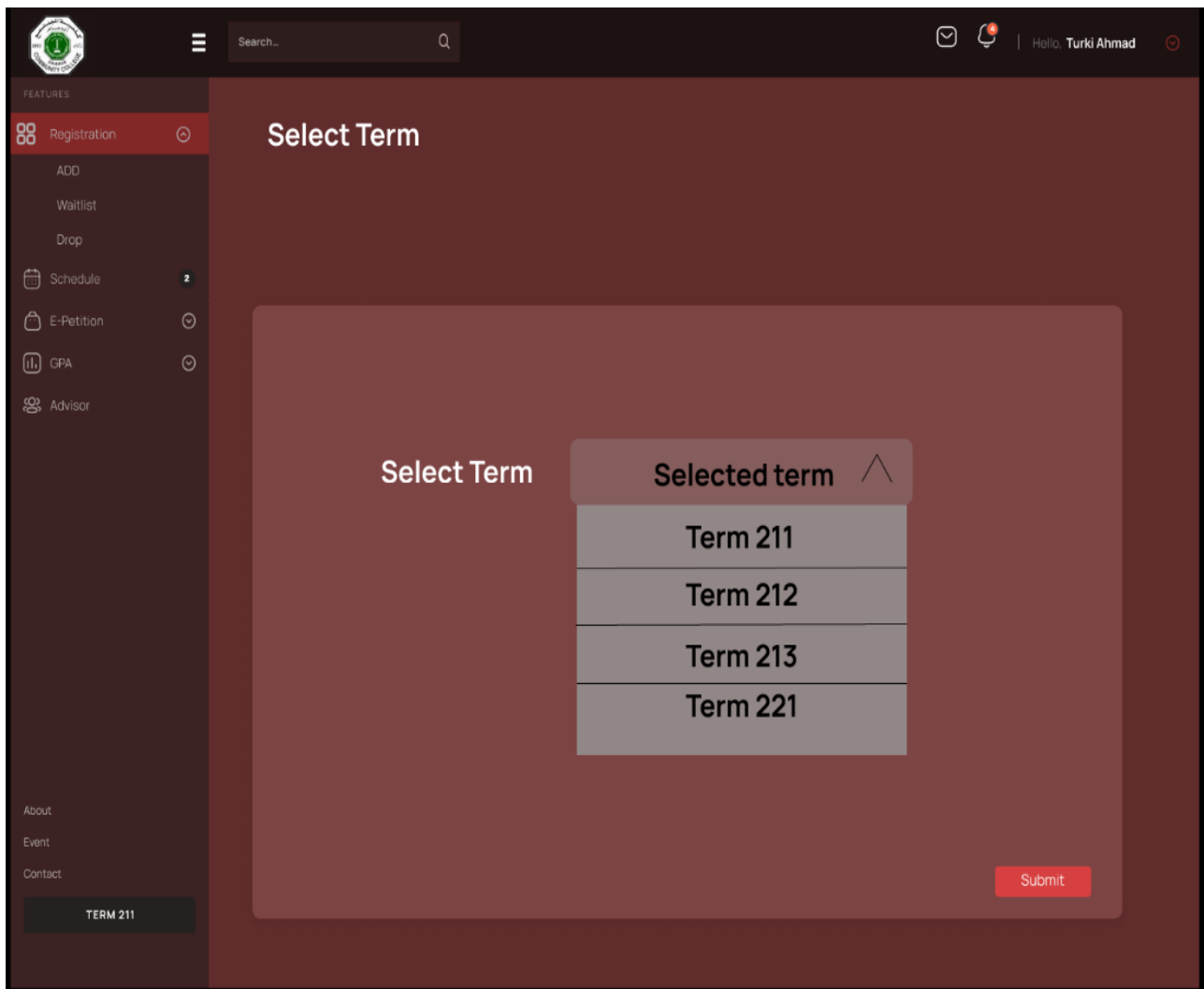*Figure 18 (Dropped Course Econ301)*

Select Term

Figure 19 (Select Term)

Project Link:

https://www.figma.com/file/KfBauicwJH78sQhBTDJauO/dashboard?node-id=0%3A1&t=gZRGXfjm0tH7do6Y-0

Demo Link:

https://kfupmedusa.sharepoint.com/:v:/r/sites/MIS301G4/Shared%20Documents/General/Recordings/Meeting%20in%20_General_-20221209_200807-Meeting%20Recording.mp4?csf=1&web=1

D5.1 Conclusion:

In conclusion our project objective focused on upgrading the original DCC registration system to make it a more usable system for all who are involved. Automation of the functions of the system which are made manually today are hoped to be eliminated from their system, reducing the duration, and making it as efficient as possible was the goal. We have added some features which are necessary for the registration system. DCC registrar welcomed our efforts and suggestion to improve their system by adding these features. The first feature to consider are the functional requirements, adding CRNs to sections is crucial, adding waitlist options has been done to rise students' chance to register courses, and it is also helpful for the department and the registrar so they could know the number of students who want to register in a section. Petitions are automated which will help to make the process faster and easier, for example now if a student wants to register in a closed section they can through the system. User Interface has been developed to make the system more interactive for the user. A table for the schedule has been added to the system. A better back end and documentation are improved to reduce individual mistakes. We have improved our communication skills through communicating with Mr. Ovais Khan, we also gained professional knowledge on how to work as a team which will be helpful for all of us in the future. Learning how to make our first project and its important elements, which are the system request and the feasibility analysis and making the project plan through Microsoft Project, also making the use cases and the DFD and ERD, acquired knowledge on how to develop the data dictionary and the use case diagram, and most importantly making the prototype and the user interface design.

Reference & Resource:

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