LONDON METROPOLITAN UNIVERSITY

islington college
(इस्लिङ्टन कलेज)

CS5002NI Software Engineering

McGregor Institute

20% Group Coursework

AY 2023-2024

Group Name:			
S.N.	**Student Names**	**College IDs**	**University IDs**
1	**Abhijay Dhoj Adhikari (L5C3)**	*NP01CP4A220057*	*22067560*
2	**Krish Bhattarai (L5C3)**	*NP01CP4A220071*	*22067570*
3	**Pratik Karanjit (L5C3)**	*NP01CP4A220047*	*22067545*
4	**Siddhanta Shrestha (L5C3)**	*NP01CP4A220043*	*22067528*
5	**Kristan Dharel (L5C3)**	*NP01CP4A220038*	*22067526*

I confirm that I understand my coursework needs to be submitted online via MySecondTeacher under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a marks of zero will be awarded.

Table of Contents

Table Of Figures

Acknowledgement

First and foremost, we would like to express our sincere appreciation to our module leader Rubin Thapa Sir for guiding us and class tutor Dipesh Raj Adhikari Sir for providing us with the expertise and invaluable insight needed. Secondly, we are grateful to our parents and siblings for providing great motivation and support.

We are also thankful to our respectful colleagues who helped us and encouraged us to make the project successful. Last but not the least, we express our sincere gratitude to all those who contributed to this project directly or indirectly.

1. Introduction

The group coursework of the module Software Engineering is about McGregor institute of Botanical Training, which is located at Godawari, Lalitpur. The institute is currently facing sudden surge in the number of people due to which they are planning to provide short term courses. They also want to sell plants for minimal price or even free in some cases. The idea is to build a platform through which users can register themselves, choose any course, purchase plants, make payments, ask the experts, take certification exams and many more. A detailed documentation for building this platform has been discussed here.

To manage the sudden surge in the number of people who are interested in the domain of the agriculture a system called “Botanic System Hub” is developed. This system has two set of fields one e-commerce platform for selling plants and other is to provide various courses. This system takes user details and registers them according to the field of interest, it checks payment details of the user. The user joins courses or purchase plants and can ask for recommendations with the experts. After completion of the course the users are provided with the certificate. The users can engage in conversation about plants and can share their opinions through the posts where other users can comment their opinion and upvote if they find the post relevant. The users can stay alert with the help of notification system where the users are notified with the relevant post. Furthermore, the users can view detailed financial report provided by the admin. Users can take mock tests, check results, and give certification exams. Also, the admin can view user and transaction detail of the user. To analyse the requirements of the system there are Data Flow Diagram (DFD), Structure Chart Diagram, Entity Relationship Diagram (ERD), Data Dictionary, Process specification and Module Specification. To create the diagrams and flow chart draw.io has been used.

This ensures a systematic development process for a user-friendly platform, addressing the institute's needs and fostering a dynamic community of agricultural enthusiasts and learners.

2. Group Tasks

2.1. Project Charter

2.1.1 Problem Statement

With the sudden surge in the likes of interested people in the field of agriculture, coping has been tough for McGregor Institute of Botanical training. To counter this sudden surge the Institute can recognize its need to adapt and expand itself accordingly.

2.1.2 Business Case

Introducing short-term courses can serve as a rapid and efficient way to increase skilled manpower. The rise in demand is directly proportional to the immediate need for education allowing individuals to acquire valuable skills in a short amount of time.

The institution is charging a minimal fee for most varieties of plants while providing some for free which attracts a diverse audience while also contributing to revenue generation by meeting the budget needs. McGregor Institution encourages wider participation which makes the plants more accessible to a broader community.

Creating a dedicated forum to strengthen the sense of community among plant enthusiasts. Idea-sharing and collaborations among enthusiasts will act as a magnet, attracting even more people to join the community, and helping in the institute's goal of creating a wonderful community.

2.1.3 Goal Statement

To meet the rapidly growing demand in interest in the domain of agriculture by introducing different strategies.

2.1.4 Timeline

A timeline is used to demonstrate a project's life cycle. It depicts milestones and deadlines for dates. This helps in keeping track of progress and complete project on time.

The following timeline shows this project's timeline over five different milestones.

- The first one indicates project's initiation and developing project charter and SRS.
- The second one focuses on creating context level diagram and DFD level 1.
- The third milestone discusses about DFD level 2 and 3, ERD and data dictionary.
- The fourth milestone focuses on process specification and structure chart.
- The fifth one is on assignment diary and overall project review.

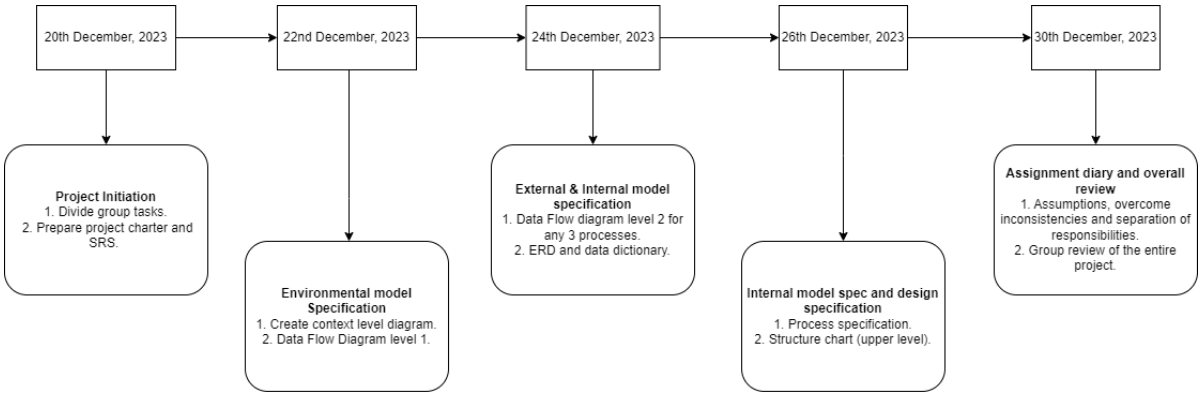

Figure 1: Timeline of the project.

2.1.5 Scope

The scope of the project is to address the sudden surge in the demand in the field of agriculture by introducing different strategic implementations. To capacitate the growing demand while still maintaining the integrity of the company a system is introduced. The system includes functions like registration, payment certification exams and report preparation in order to facilitate changes like introduction to short term, graduate, postgraduate courses which has both paid and unpaid options, selling of plants in bulk.

2.1.6 Team Members

- Abhijay Dhoj Adhikari (Leader)
- Krish Bhattarai
- Siddhanta Shrestha
- Pratik Karanjit
- Kristan Dharel

2.2 SRS (Software Requirement Specification)

2.2.1 Functional Requirements

- **Registration of user**

  The system should collect and store information of the user, which are essential to join the forum and to buy plants. It should take necessary information like name, contact, email from the user. The registration process involves sub functions like validating the user credentials and registering the user in the database.

- **Enrolment in courses**

  The system should offer a user-friendly interface showcasing the various programs and courses available. The user should be able to select from the available courses. Payment option should be available for the paid programs or courses.

- **Take certification exams.**

  The system should offer different mock tests and certification exams related to the topic for users. After meeting the required criteria, users should be able to take the test. The system should also store and record the exam data which should be available for display later on.

- **Purchasing of plants**

  The system should showcase a interface of available plant varieties along with all their details like name, pricing, images, etc. The option to add to card should be available for users. The system should provide a safe and secure payment gateway.

- **Payment for the purchase of plants**

  The system should accept various payment methods and integrate a secure payment gateway for the purchase of plants. It should also record and store all the payment detail which will be used to create a proper payment report.

- **Report preparation**

  The system should provide tools to create financial reports, employee reports and user reports in the administrative panel. The system should create these reports based on specific time ranges.

- **Ask for recommendations**

  The system should provide a section for users to be able to ask for recommendations from experts of the respective field. The experts should be able to reply to or provide their expertise or recommendations to the users based on the user's queries.

- **Making of the forum**

  The system should allow users to post and discuss with other users regarding plants. Features can include liking the post, commenting on the post, direct messaging so that the users can communicate with each other, and sharing posts.

- **Get Notifications**

  The system should send notifications related to posts, enrolment, purchase details and engagement to the users. Notification management or preferences should also be available for the users.

2.2.3 Non-functional requirements

- **Usability**

  The system should be easy to use meaning that users should be able to navigate through the system in an efficient manner making their experience productive.

- **Reliability**

  The system should be reliable meaning that there is minimal downtime for updates and maintenance while also ensuring accuracy.

- **Consistency**

  Proper design guide must be followed to have a consistent layout and functionality throughout the website to enhance the user experience.

- **Accessibility**

  For the platform to be easily accessible, the website needs to have good Search Engine Optimisation (SEO). This ensures that when a user searches for the website by entering its name/details the site should be at the top of search results. It is a challenge to maintain good SEO to have good reach.

2.2.4 External Interface requirements

- **User Registration Interface**

  User Registration Interface for the given scenario could be as follows:

  For new admission, the system should contain a login form in which the details about the student and the course are filled with a unique username and passcode.

  For registered students, there should be a login page where users can register using a username and password to access the services.

- **Hardware**

  The website should be hosted in proper performance servers for the seamless functioning and management of databases effectively.

  Backup systems and storage devices should be managed to backup and restore data in the case of data loss or system failure.

  The website should be made compatible with different devices like a laptop, smartphone, tablets, etc. It should support different operating systems like Windows, macOS, Linux, IOS, etc.

  The website should be scalable to manage user traffic and provide a seamless user experience.

- **Software**

  Software interfaces for the given scenario could be as follows:

  Product listing is a major aspect for the end user to browse and search for products with their descriptions. It is the most basic and crucial part of a platform-based product selling interface.

  Searching and filtering products for the user's easy access can be another major interface requirement.

Including a messaging system, such as live chat and comment posting is another essential requirement to faster engagement among users and cultivate a sense of community.

- **Communication**

  Communication interfaces for the given scenario could be as follows:

  Discussion Forums play a vital role in allowing users to discuss, share knowledge, and seek guidance from people with the respective specialisation and like-minded people.

  The private messaging feature makes it a lot simpler for users to communicate with each other in a private and secure space.

  The option to comment on posts gives the website a much more social environment allowing users to provide their opinion on the matter at hand.

  Alerts for course updates, post comments, new plant options, and upcoming events can help the website appeal and maintain more users.

2.3 Detailed specification of Group Tasks

2.3.1 Environmental model specification

2.3.1.1 Context diagram

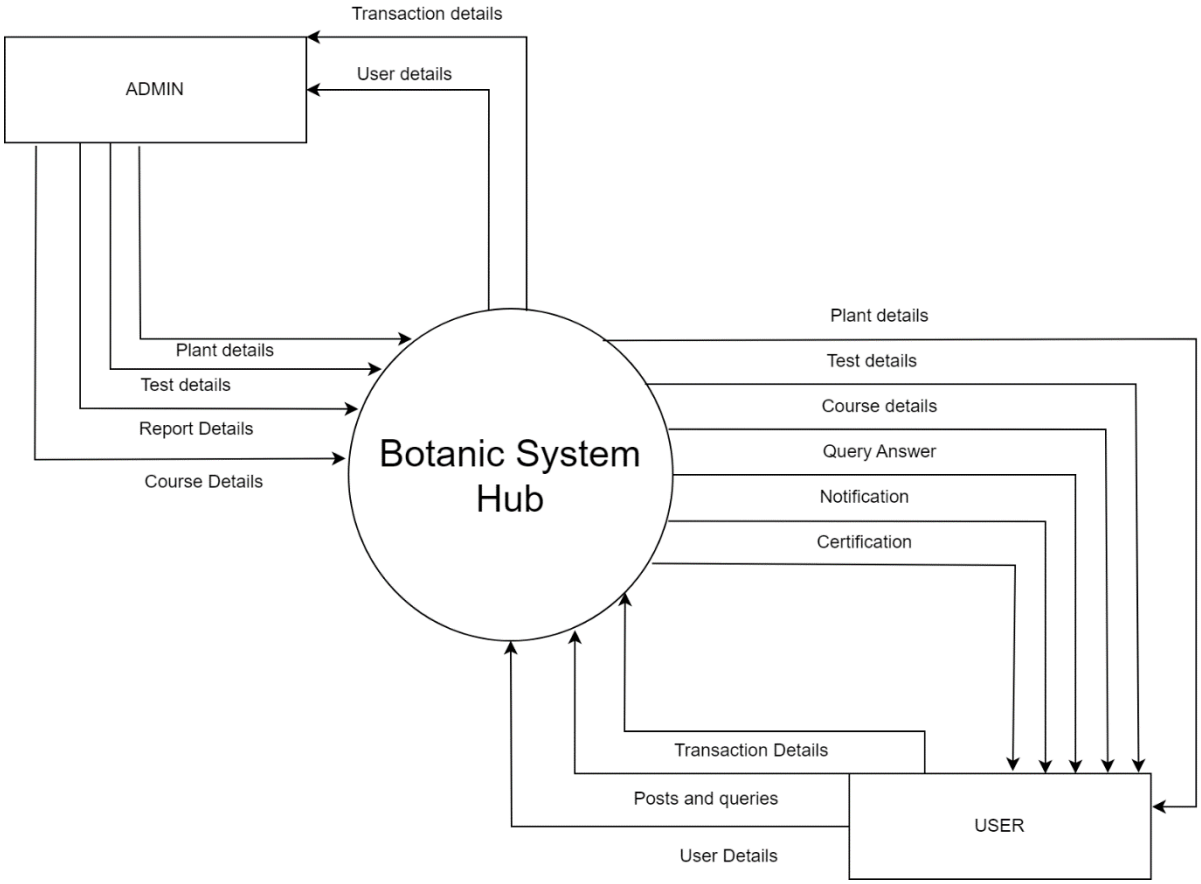

Figure 2 Context Level Diagram

2.3.1.2 Level 1 DFD

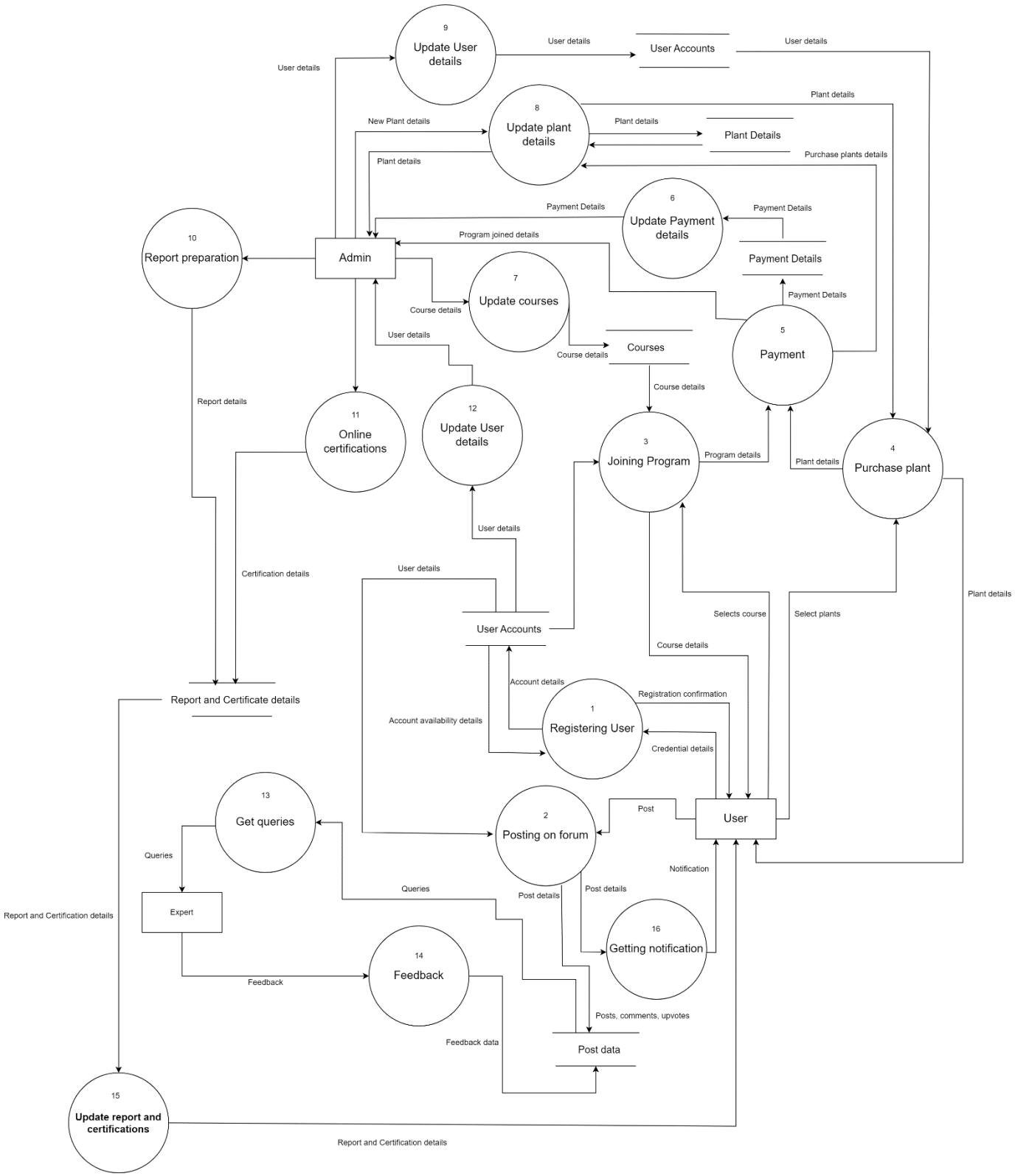

Figure 3 DFD LEVEL 1

2.3.1.3 Level 2 DFD

a. Register

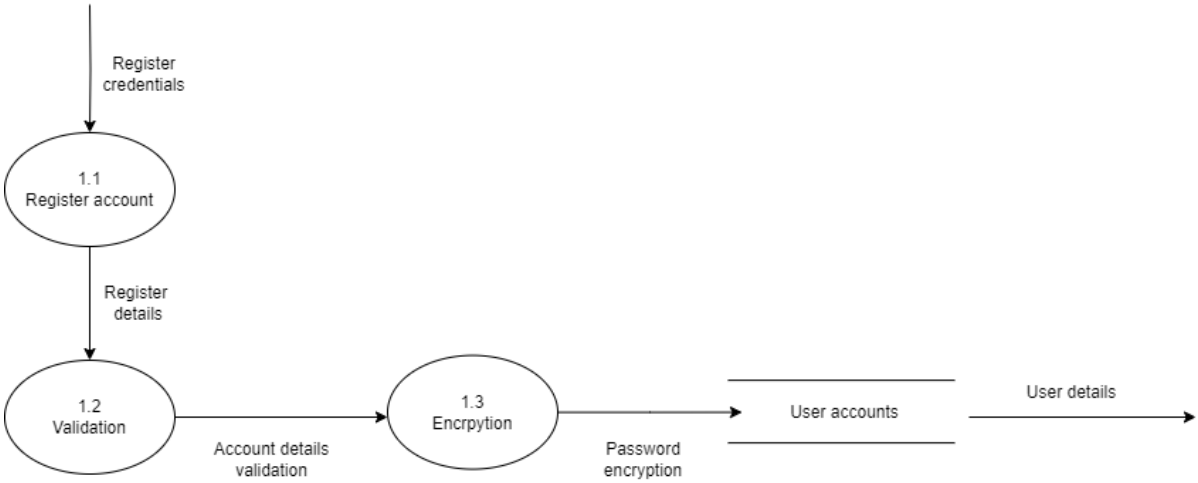

Figure 4: Register DFD level 2.

b. Post on forum

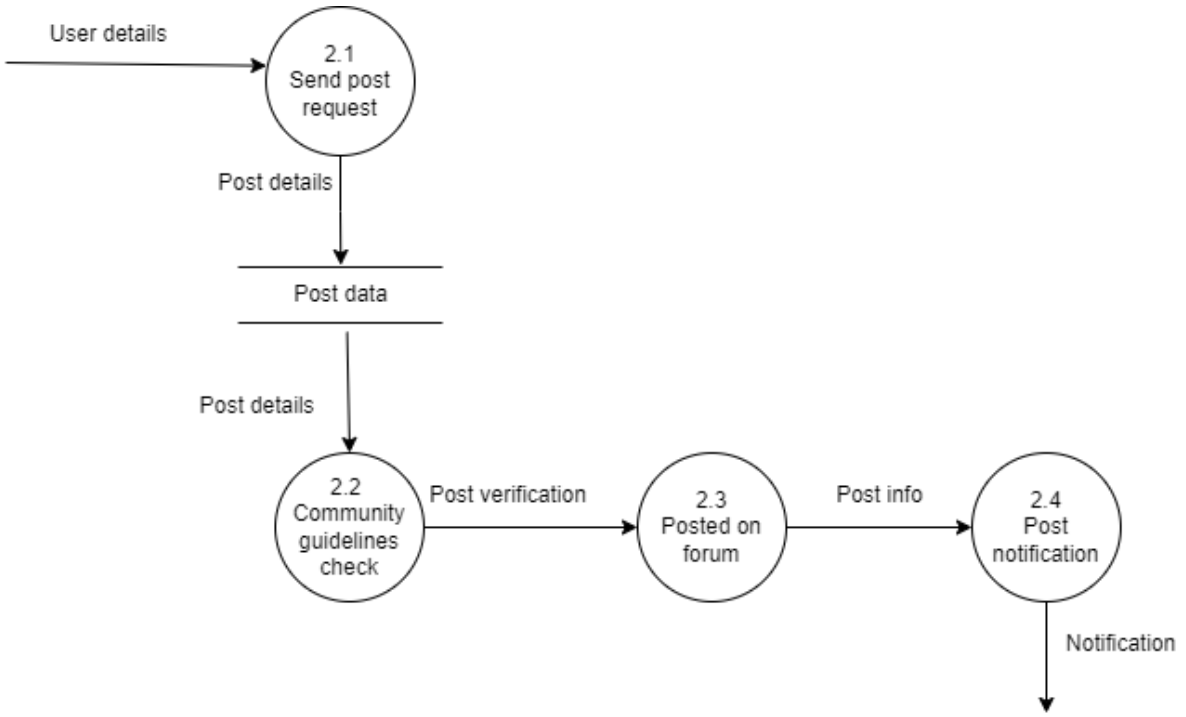

Figure 5: Post on forum DFD level 2.

c. Join program

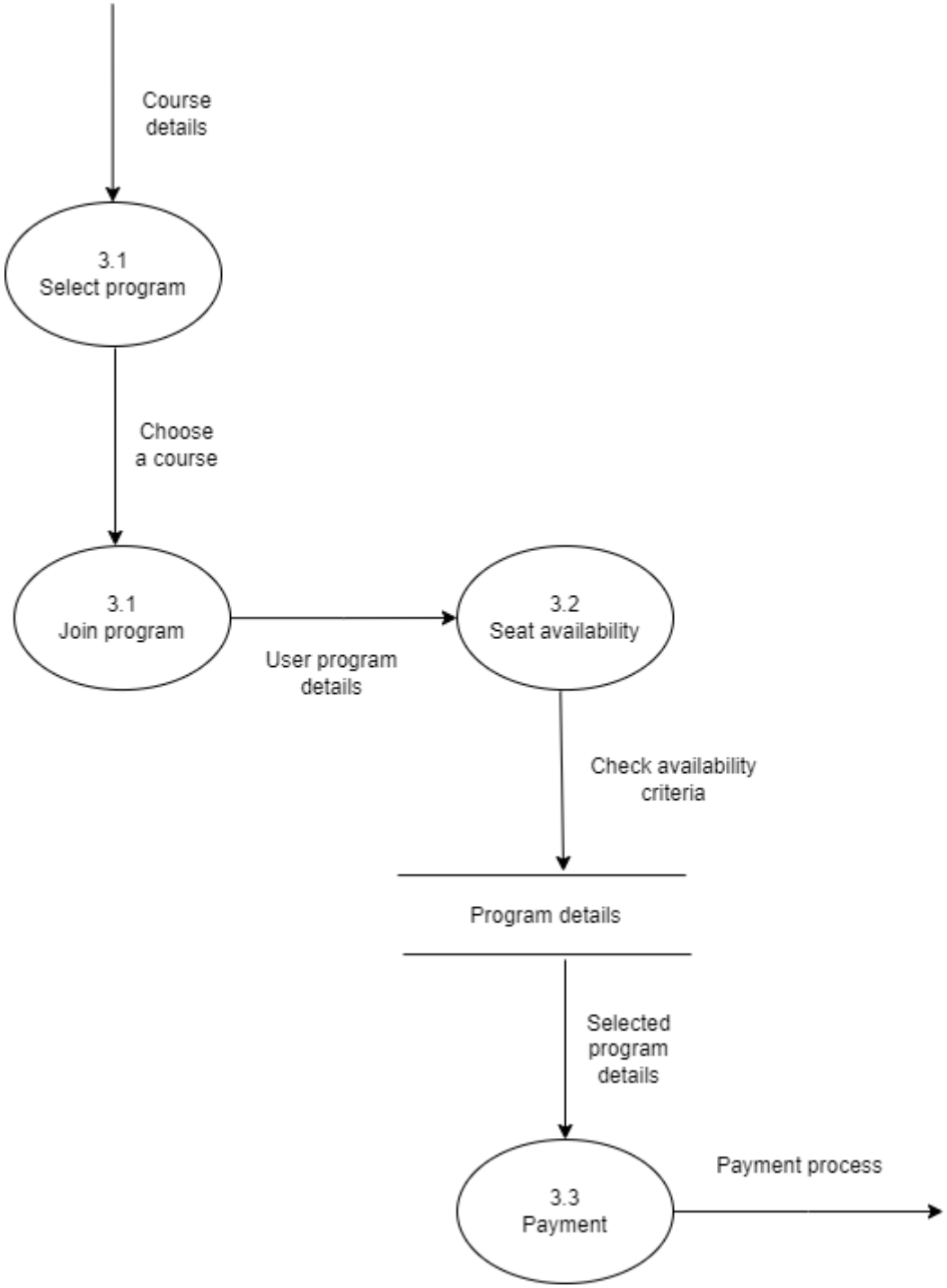

Figure 6: Join program DFD level 2.

2.3.2 Internal Model Specification

2.3.2.1 Entity Relationship Diagram (ERD)

An entity relationship diagram is a visual representation of showcasing the connections between people, objects, concepts, or events. These diagrams are often used to design relational databases in the field of software engineering and business information systems. (LucidChart, 2023)

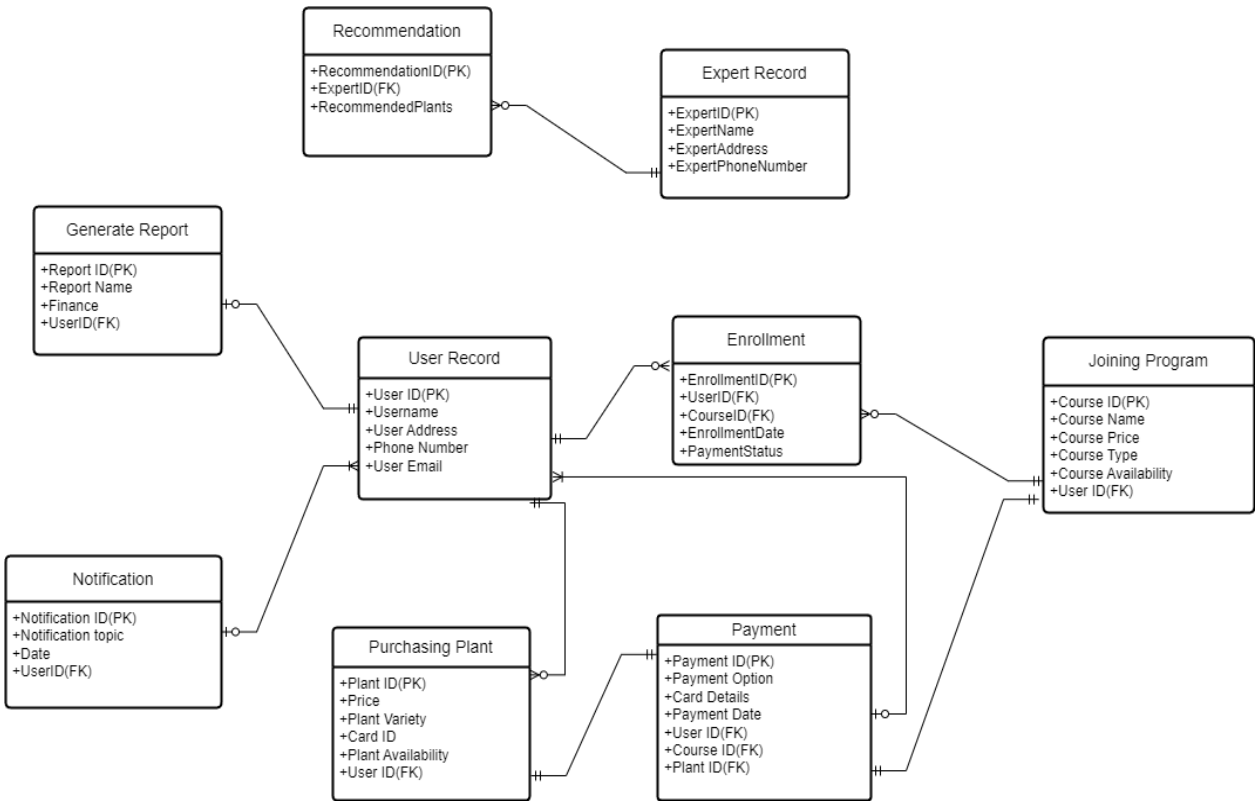

Figure 7: Entity relationship diagram of the system.

2.3.2.2 Data Dictionary

A data dictionary compiles names, explanation and characteristics of components used or stored in a database or system. It describes the importance and functions of the data components within the project. It is also known as Data Definition Matrix due to its capability of to provide information about business data. Data dictionaries are widely used for various reasons. (UC Merced Library, 2023)

Some of the reasons are:

i) Help in preventing discrepancies in data throughout a project.
ii) Help establish guidelines or a certain set of rules to be followed.
iii) Make the analysis of data easy.
iv) Make the use of data more consistent throughout the project.

Data dictionary for whole system

User details = user id + username + address + phone + email

Credentials details = user id + username + address + phone + email

Account availability details = Email

Post Details = Posts+ likes + comments + upvotes + downvotes + notifications

Notification = Title + Post details

Program details = Program Title + Program Description + Program price

Plant details = Plant ID + Plant Name + Plant Description + plant availability + Plant price

Payment Details = User Details + Payment ID + Payment Option + Payment confirmation +total amount paid

Course Details = Course ID + Course name + Course Description +Course Price +Course availability

Program Joined details = User Details + Course Details

Registration Confirmation = Email

Expert Details = Expert ID + Expert Name + Expert Email + Expert Number

Report Details = Report ID + [User report, Financial Report]

Certification Details = User Details + Course Details

Data Stores:

Report and Certification Details = Report Details + Certification Details

User Accounts = User Details + Account Details

Payment Details = Payment Details

Courses = Course details

Plant Details = Plant details

Post Data = Post details + Feedback details

2.3.2.3 Process specification (Pspecs) for elementary processes

- **Process A**

  Number: 1.1

  Name: Register account

  Description: This process takes the register credentials sent by the user and sends it for verification.

  Input Data Flow: Registration credentials.

  Output Data Flow: Registration credentials.

  Process Logic: The logic for this process is as follows:

  i) User registration details are taken.
  ii) The data is sent for verification to the next sub process(1.2)

- **Process B**

  Number: 1.2

  Name: Validation

  Description: This process validates the register details and sends the details for encryption process.

  Input Data Flow: Registration credentials.

  Output Data Flow: Validated user details.

  Process Logic: The logic for this process is as follows:

  i) Registration credentials are taken.
  ii) The credentials are validated.
  iii) If credentials are not valid, the registration is denied for the user.
  iv) If credentials are valid, they are sent to the next sub process(1.3).

- **Process C**

  Number: 1.3

  Name: Encryption

  Description: This process takes the validated data and sends the password for encryption for security purposes

  Input Data Flow: Validated account details

  Output Data Flow: Encrypted password details

  Process Logic: The logic for this process are as follows:

  i) Validated registration credentials are taken .
  ii) The password is taken from all the credentials.
  iii) The password is then encrypted.
  iv) The details along with the encrypted password is sent to the user accounts data store for future use.

- **Process D**

  Number: 2.2

  Name: Community guidelines check

  Description: This process verifies whether the community guidelines have been met while creating a post.

  Input Data Flow: Post details

  Output Data Flow: Verified post details

  Process Logic: The logic for this process are as follows:

  i) Created post is received by community guidelines check sub process.
  ii) If community guidelines are met, request to post gets accepted.
  iii) If the community guidelines are not met, the request gets cancelled.

iv) If valid post is formed, then the valid data is passed to next sub process (0.2.3)

- **Process E**

Number: 2.3

Name: Posted on forum

Description: This process successfully posts the post after the community guidelines check.

Input Data Flow: Post verification

Output Data Flow: Post + notifications

Process Logic: The logic for this process are as follows:

i) Verified post details are received here.
ii) The verified posts get posted.
iii) The post details then get sent to the next sub process for providing notifications about the post.

2.3.3 Design Specification

2.3.3.1 Structure Chart

A structure chart illustrates the hierarchical arrangement of modules in a system. It divides the entire system into the smallest functional modules and elaborates on the functions and sub-functions in detail. (GeeksForGeeks, 2023) They are widely used to visually illustrate the logical processed in a system. It also deciphers the complexity of a system. (Wikipedia, 2023)

Structure chart is useful in a certain type of programming approach. It is typically used in modular programming where each module handles a distinct task, and the chart illustrates how these modules relate and interact with the software. It is created before coding the software and doesn't give the detailed programming logic of the software. (GeeksForGeeks, 2023)

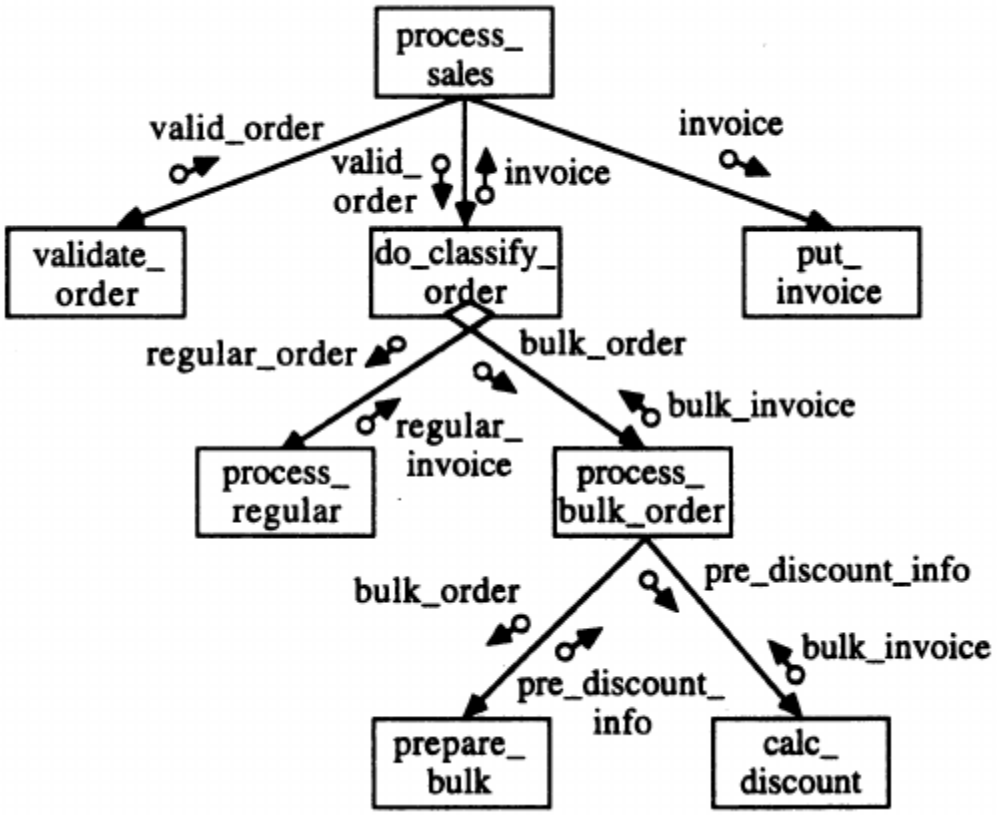

Figure 8: Structure chart example (ReasearchGate, 2024)

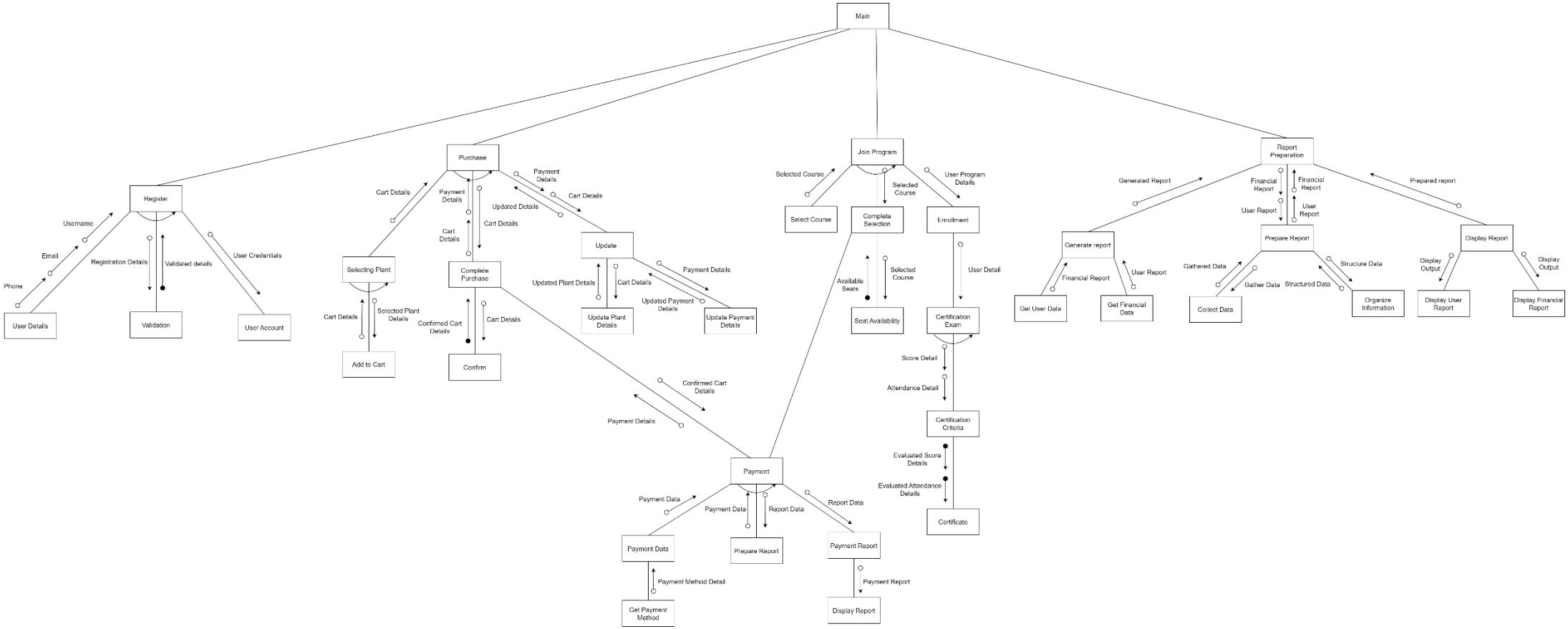

Figure 9:Structure chart of the whole system.

2.3.3.1 Assignment Diary

2.4.1 Assumptions

- User can only purchase plant after registering.
- User accounts data store connects to almost all the process to know who the process is being done by
- Admins can update the user accounts and plant details.
- The plant details data store is updated by the user only after the payment is confirmed.
- Certificate and report data are stored in the same data store as Users are only ones accessing it.
- There is only one user account registered per person and they can purchase the plant, join the program, and also post in forum with the same account.
- Users include the students, the customers, the forum members, and the staffs.
- Only users can register themselves.
- Users need to have an account to view the forum posts.
- Admins appoint the experts from the users and only they are allowed to answer queries.
- User only joins the program after the payment is confirmed.
- Plant details is only updated after the payment is confirmed.
- Plant details can only be updated once a purchase is made or when the admin adds new plant.
- Payment is made by the users even if the course or the plant is free.
- The plant details only go to the admin.
- Payment details is only updated when payment verification is done.
- User details is only updated when the admin updates it or when users register themselves.

- Reports are only prepared when payment is done by the user.
- Report and certificates are stored in the same data store.
- The user gets notified when experts and other users interact with their post.

2.4.2 Inconsistencies/omissions in the project

- The user's authentication and authorization process are not clarified.
- The users must go through the payment process even for those plants and courses that are free of cost. This is because the system runs on a freemium model which means that basics services are offered for free, and the payment details are required for potential monetization in the future.
- The system does not mention different levels of admin roles with distinct permissions. It is mentioned that the admins can update user details and plant details but not with specific admin roles.
- The process of choosing expert by the admin is not explained. They are just appointed by the admins.
- There are no different levels of forum access in the system, anyone can view these posts, for example, posts that are public/registered users post/expert's posts.
- The system states that plant details can only be updated once purchase is made but it also states that admin can update the available plants which does not require any purchasing process.
- The process of payment verification is not explained.
- Users are only notified when experts reply to their posts.

2.4.3 Group Member Responsibilities

Group member names	Tasks
Abhijay Dhoj Adhikari	Problem Statement, Functional Requirements, Environmental model specification, Internal Model Specification, Purchase plant individual task, Acknowledgement
Pratik Karanjit	Business case, Functional Requirements, Environmental model specification, Internal Model Specification, Join the program individual task, Introduction. Acknowledgement
Siddhanta Shrestha	Goal Statement, Non-functional Requirements, External Interface Requirements, Environmental model specification, Internal Model Specification, Make Payment individual task
Krish Bhattarai	Timeline, Non-functional Requirements, External Interface Requirements, Environmental model specification, Design Specification, Report Preparation individual task, Summary
Kristan Dharel	Scope, Non-functional Requirements, External Interface Requirements, Environmental model specification, Design Specification, Certification exam Individual task, Introduction

2.4.3 Group meeting log

Team Meeting Log 1

Location: Library

Date: 22/12/2023

Time: 1:00 p.m.

Agenda items

1. Go through the coursework question file and get a rough idea of the project.
2. Divide project charter into five members of the group.

Names	Tasks	Deadline	Status
Abhijay Dhoj Adhikari	Problem statement, Goal statement	24/12/2023	Completed
Pratik Karanjit	Timeline, Business case.	24/12/2023	Completed
Kristan Dharel	Business case, Goal statement.	24/12/2023	Completed
Siddhanta Shrestha	Timeline and scope.	24/12/2023	Completed
Krish Bhattarai	Timeline, Team members.	24/12/2023	Completed

TEAM MEETING LOG 2

Location: Library

Date: 25/12/2023

Time: 2:00 p.m.

Agenda items

1. Get started with SRS, functional requirements, non-functional requirements, and external interface requirements.
2. Divide SRS tasks into five members of the group.

Names	Tasks	Deadline	Status
Abhijay Dhoj Adhikari	Functional requirements.	26/12/2023	Completed
Pratik Karanjit	Functional requirements.	26/12/2023	Completed
Kristan Dharel	Non-Functional requirements.	26/12/2023	Completed
Siddhanta Shrestha	Non-Functional requirements.	26/12/2023	Completed
Krish Bhattarai	External interface requirements.	26/12/2023	Completed

TEAM MEETING LOG 3

Location: Chiya Chautari

Date: 27/12/2023

Time: 4:00pm

Agenda items

1. Create context level diagram and data flow diagram level 1.
2. Discuss possible data flows in between entity and process.
3. Divide the task into five members of the group.

Names	Tasks	Deadline	Status
Abhijay Dhoj Adhikari	Context level diagram.	28/12/2023	Completed
Pratik Karanjit	Context level diagram.	28/12/2023	Completed
Kristan Dharel	DFD level 1.	28/12/2023	Completed
Siddhanta Shrestha	DFD level 1.	28/12/2023	Completed
Krish Bhattarai	Context level diagram.	28/12/2023	Completed

TEAM MEETING LOG 4

Location: Chiya Chautari

Date: 29/12/2023

Time: 11:00 A.M.

Agenda items

1. Create Entity Relationship Diagram (ERD).
2. Write data dictionary with definition for major data flows, data stores and entities.
3. Divide the task into five members of the group.

Names	Tasks	Deadline	Status
Abhijay Dhoj Adhikari	Entity Relationship Diagram.	30/12/2023	Completed
Pratik Karanjit	Entity Relationship Diagram.	30/12/2023	Completed
Kristan Dharel	Data dictionary.	30/12/2023	Completed
Siddhanta Shrestha	Data dictionary.	30/12/2023	Completed
Krish Bhattarai	Entity Relationship Diagram.	30/12/2023	Completed

TEAM MEETING LOG 5

Location: Brit café

Date: 31/12/2023

Time: 1:00 p.m.

Agenda items

1. Write process specifications for elementary processes.
2. Design structure chart for the whole system and the task into five members of the group.

Names	Tasks	Deadline	Status
Abhijay Dhoj Adhikari	Process specifications.	1/1/2024	Completed
Pratik Karanjit	Process specifications.	1/1/2024	Completed
Kristan Dharel	Structure chart.	1/1/2024	Completed
Siddhanta Shrestha	Structure chart.	1/1/2024	Completed
Krish Bhattarai	Structure chart.	1/1/2024	Completed

3. Individual Tasks

3.1. Make Payment (22067528 Siddhanta Shrestha)

3.1.1 Environmental model Specification

3.1.1.1 **Context** level diagram

The following figure shows the context level diagram for the payment process of plants and enrolled courses by the user. The figure displays the user paying for the course or plant. The user also receives a confirmation to proceed with the payment. In addition, the purchased plant and enrolled course details are also going to the user from admin.

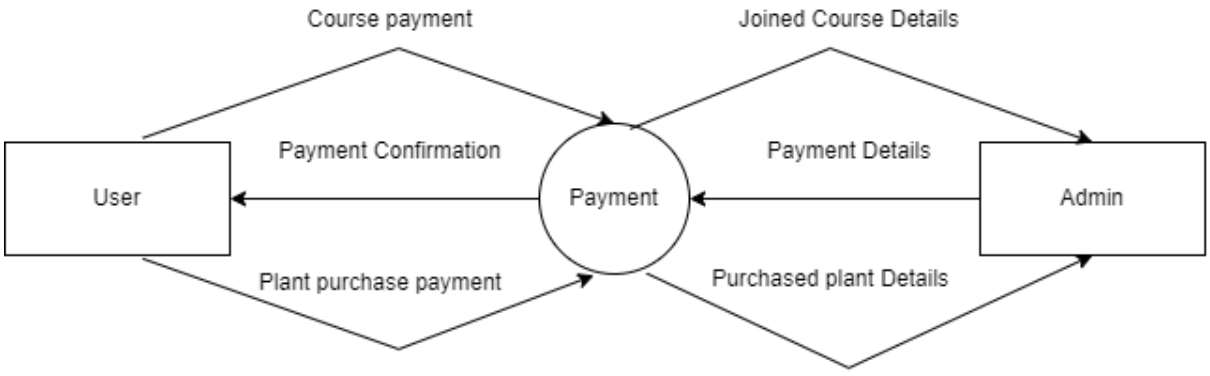

Figure 10: Context level diagram for make payment process.

3.1.2 Internal model specification

3.1.2.1 Level 1 DFD

The figure below is the Level 1 DFD of the process of payment. The DFD shows the user selecting the plant or course and then paying for it. After the payment, the details of the payment are stored in the payment details data store. The data store then sends the details to create a payment report, a type of receipt. The admin then receives the enrolled course and purchased plant details which is then sent to the User accounts data store which stores all the details related to the user.

To know which user is selecting the plant or the course, user detail is also sent to the selecting process from the admin.

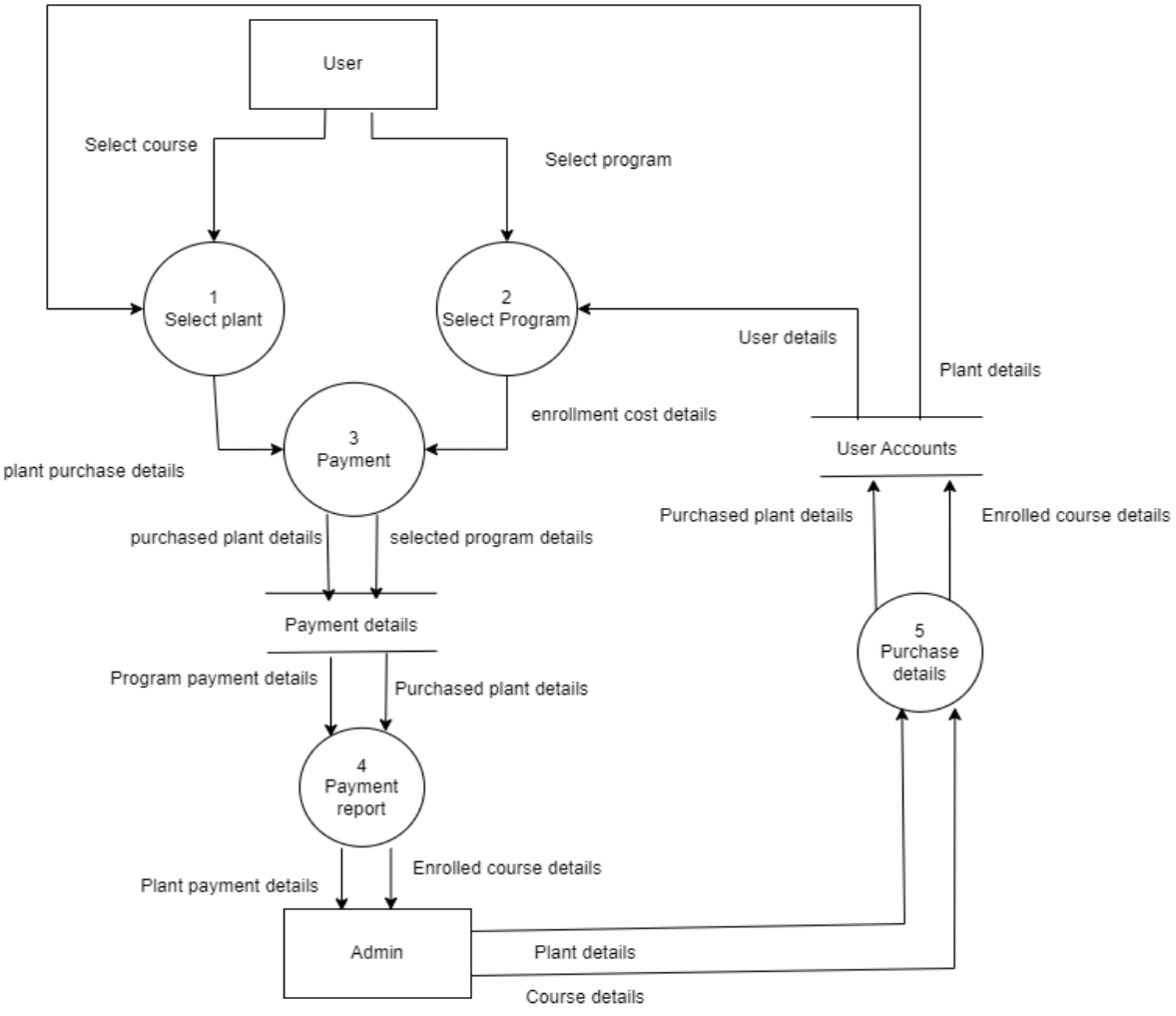

Figure 11: Level 1 DFD for make payment.

3.1.2.2 Level 2 DFD

The figure below is the level 2 DFD of the payment process. The DFD shows the user details and the selected plant and course details going to the payment process. The payment method also goes to the payment process. The verification process is then carried out where the linked user payment details are verified and then sent to the payment details data store. The data is then sent to the payment report process which processes and creates a proper report (type of receipt) of the purchase or the enrolment which is then displayed to the user through the display report process. The payment report is also sent to the admin for the purpose of the next processes.

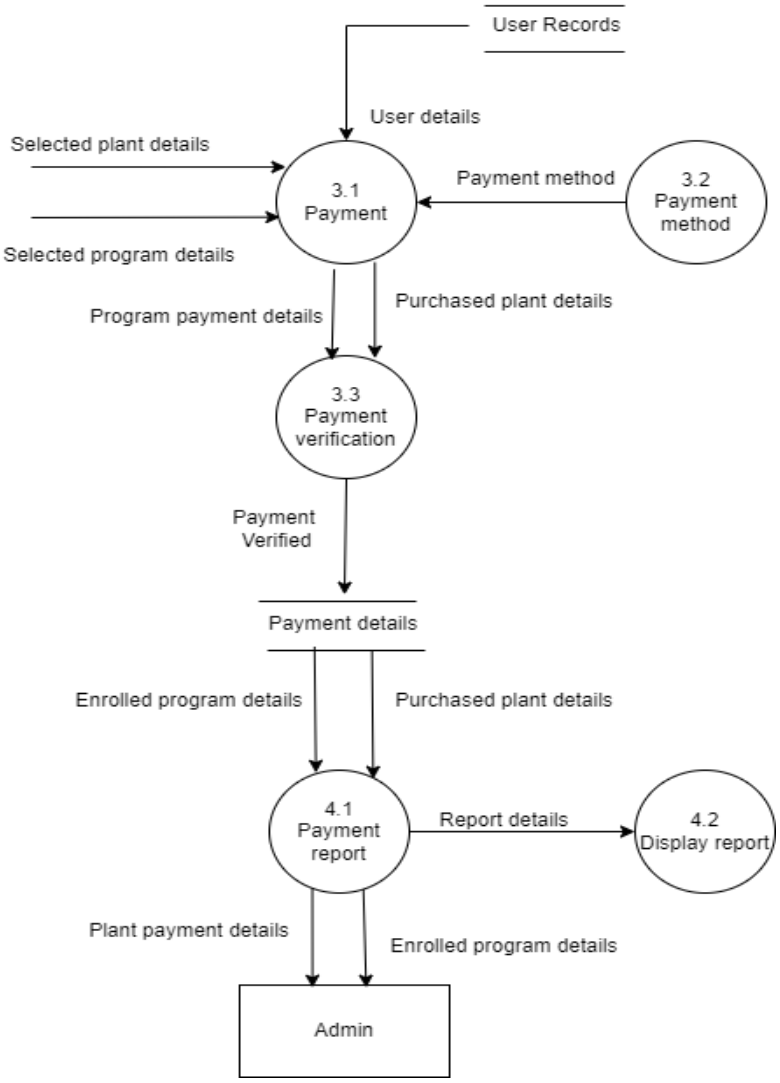

Figure 12: Level 2 DFD for make payment process.

3.1.3 Design specification

3.1.3.1 Structure Chart

In structure chart of join program module, the first parameter indicates the payment data flowing into join program module. This further divides into sub modules which indicates input, process, and output flow. The left module takes in input from the user, in this case, it's the payment process the user wants to complete. The main module is repeated in a loop which explains that a user can have the payment process for another course, or another plant purchase and the same process would continue.

In processing, i.e., second sub-module, the verification of proper payment details for that course or plant is done. It returns the verified data and sends it to the prepare report sub module which then returns the proper payment report of the customer which then moves towards output. The payment report data parameter indicates data flowing into the final module which is the output module. This holds a sub module which displays the final report of the payment process of the user.

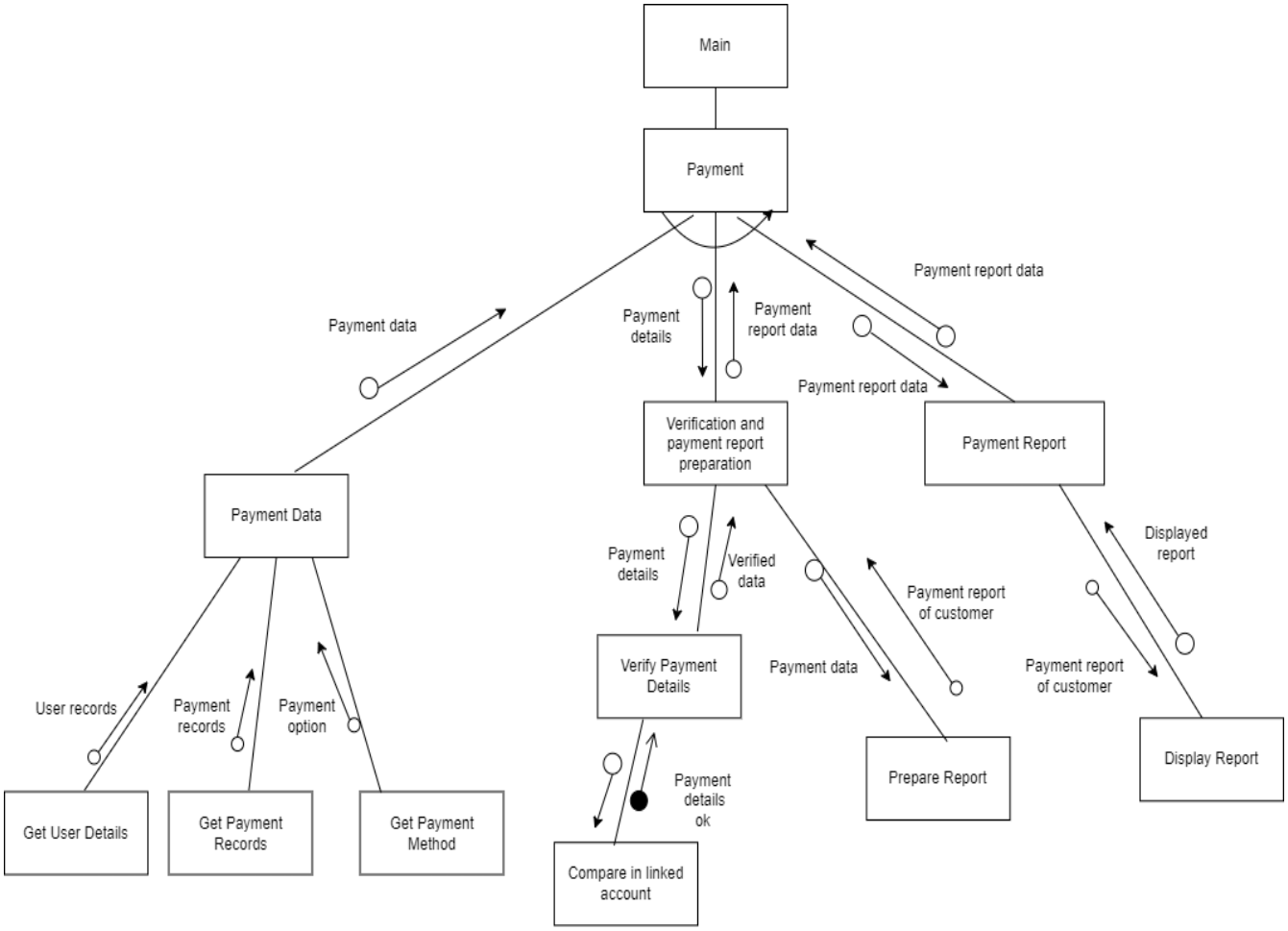

Figure 13: Structure chart for make payment process.

3.1.3.2 Module specifications

Module Name: Make Payment

Purpose: The purpose of this module is to complete the payment process of either purchasing plants or enrolling in a program. It also collects data of the payment process, user details and payment method and creates a final report to display the payment report.

Psuedocode:

DO

var customer_details = DB.get_user_details()

var payment_verification = DB.get_verification_details()

var payment_method = DB.post_payment_method()

var payment_records = DB.get_payment_records()

var report=payment_report(customer_details, payment_method, payment_records)

Display(report)

END DO

INPUT PARAMETERS: payment_method

OUTPUT PARAMETERS: report

GLOBAL VARIABLES: DB

LOCAL VARIABLES: customer_details, payment_verification, payment_method, payment_records, report

CALLS: customer_details, payment_verification, payment_method, payment_records

CALLED BY: Main

3.2 Purchase Plants (22067560 Abhijay Dhoj Adhikari)

3.2.1 Environmental model Specification

3.2.1.1 Context Level Diagram

The following figure shows the context level diagram for the purchase of plants by the user. The figure displays the user purchasing the plant with the details of the session that includes date and time of purchase. Then the plant details go back to the user itself and admin as well. In addition, plant details are also going to the user from admin indicating new plants that could have been added.

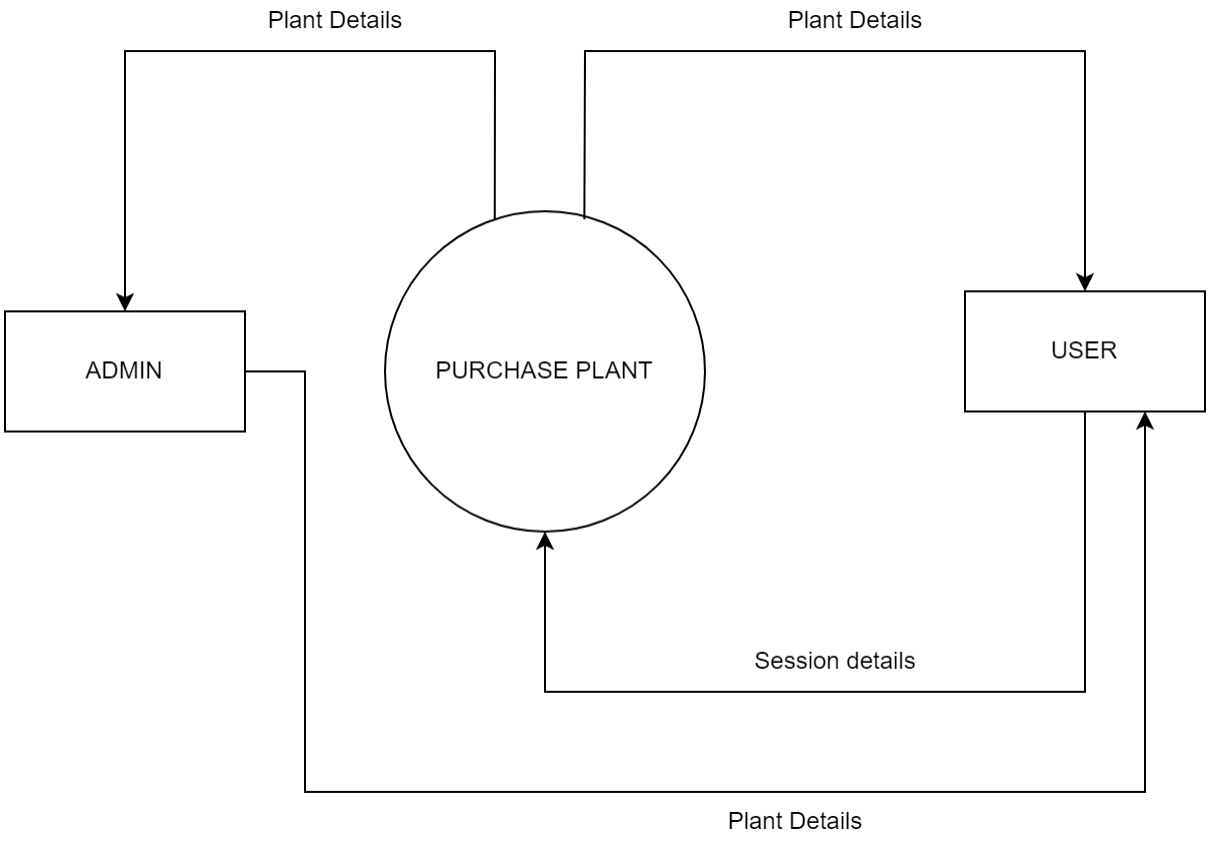

Figure 14 Purchase Plant Context Level Diagram

3.2.2 Internal model specification

3.2.2.1 Level 1 DFD

The figure below is the Level 1 DFD of the process of purchasing plants. The DFD shows the user selecting the plant and then paying for it. Only after the payment is confirmed plant details get updates in the system. The admin also can send new plant details to the Update Plant Details process which then gets updated in the data store. The updated details then get sent to the admin and the user while selecting plant.

To know which user is selecting the plant, user detail is also sent to the selecting process from the admin.

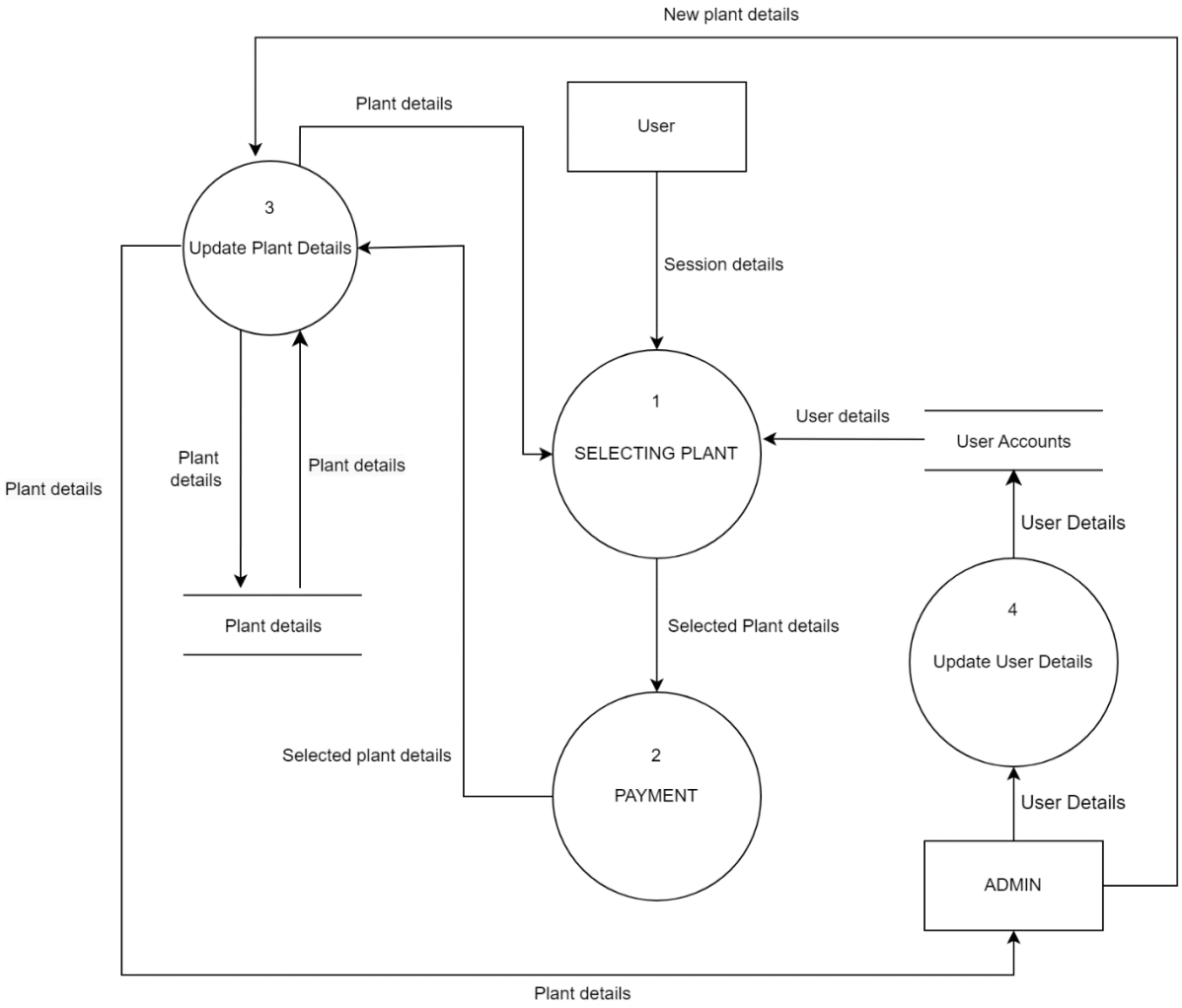

Figure 15 Level 1 DFD - Purchase Plants

3.2.2.2 Level 2 DFD

The following figure is the level 2 DFD of the process purchase plants. This DFD shows more in depth of the processes in level 1 DFD. The selection process gets broken down with the addition of cart and purchase confirmation. Payment is also broken down which shows choosing of payment option and also the confirmation of purchase.

With the confirmation of the payment the plant details get updated, and the payment details also get update which goes to the administrator.

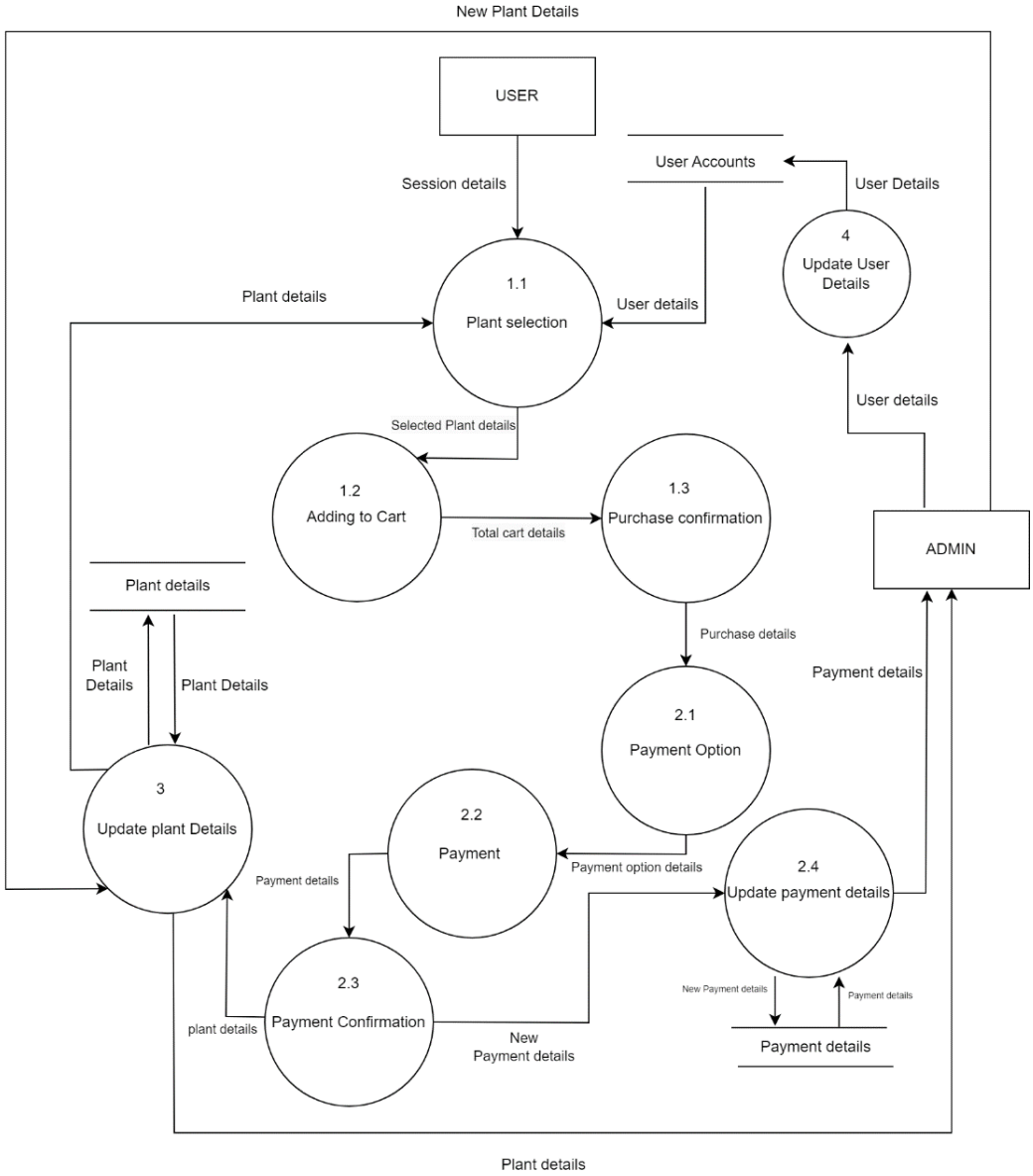

Figure 16 Level 2 DFD - Purchase Plants

3.2.3 Design specification

3.2.3.1 Structure Chart

The figure below shows the structure of the process purchase plants in an input, process, and output format. The sub-modules are broken down in detail with the flow of data indicated by parameters.

The main module has repetition indicated by the curved arrow to show that the user can purchase plants multiple times.

The left sub-module indicated the input part. It clearly demonstrates that the user selects the plants and adds them to the cart and then the cart details go back for the processing.

The processing part is indicated by Complete Purchase sub-module. The sub-module consists of two modules that are confirm selection and payment. Once the user confirms the selection the selected plants get verified and then only the process of payment comes into place. After the payment, the payment details and the cart details go to the output part which is to Update sub-module. This sub-module updates the plant details and the payment details.

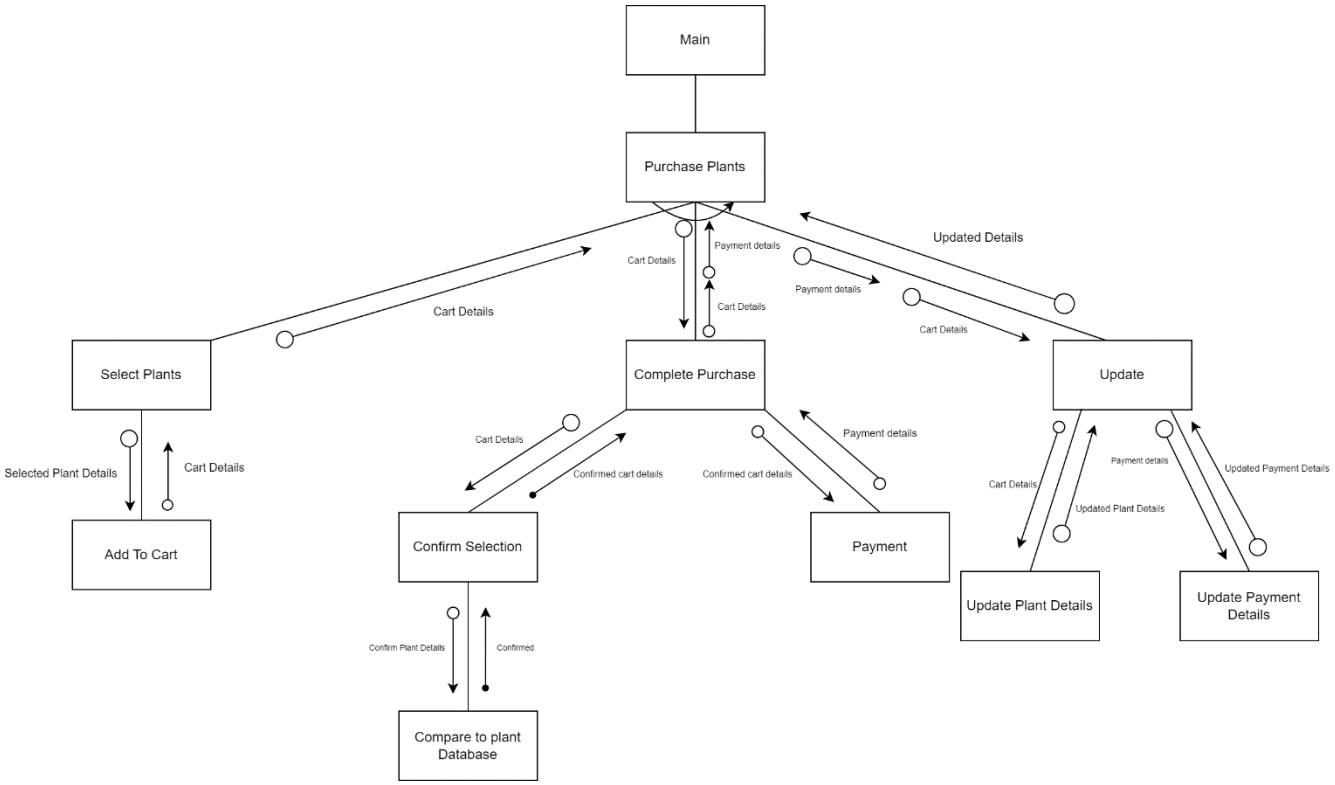

Figure 17 Purchase Plants Structure chart.

3.2.3.2 Module Specification

Module Name: Purchasing Plants

Purpose: The purpose of this module is to enable users to select plants, add the plants to the cart, and pay for the plants after confirming the selection. Then the plant details get updated accordingly.

Pseudocode:

DO

var plant_details = DB.get_plant_details()

var customer_details = DB.get_customer_details()

var chosen_plant = DB.post_chosen_plant()

var cart_details = DB.get_cart_details()

var confirmation_details = DB.post_confirmation_details()

var payment_details = DB.get_payment_details()

var plant_update = DB.update_plant_update()

var report = payment_report(customer_details, chosen_plant, payment_details)

Display(report)

END DO

INPUT PARAMETERS: chosen_plant, confirmation_details

OUTPUT PARAMETERS: report

GLOBAL VARIABLES: DB

LOCAL VARIABLES: plant_details, customer_details, chosen_plant, cart_details, confirmation_details, payment_details, plant_update, report

CALLS: plant_details, customer_details, chosen_plant, cart_details, confirmation_details, payment_details, plant_update

CALLED BY: Main

3.3 Report Preparation (22067570 Krish Bhattarai)

3.3.1 Environmental Module Specification

3.3.1.1 Context Level diagram

The figure below illustrates the context level Data Flow Diagram for Report Preparation. It shows that the admin views user details and financial details, initiates a report.

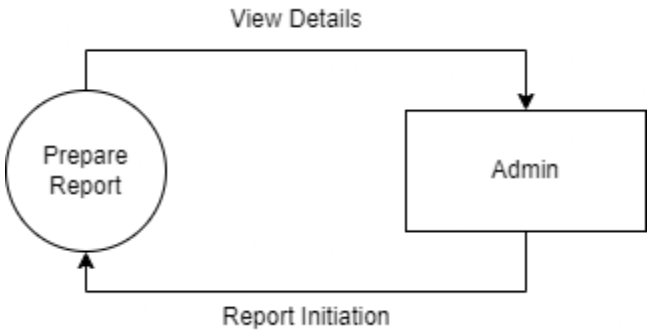

Figure 18: Context Level Diagram for Report Preparation

3.3.2 Internal Module Specification

3.3.2.1 Level 1 DFD

The figure below illustrates the Level 1 Data Flow Diagram for Report Preparation. It shows that the User Details and Financial Details are stored in a data store named Records from which the admin collects the data. The admin then uses that data to generate reports which is then processed and stored in its respective data store.

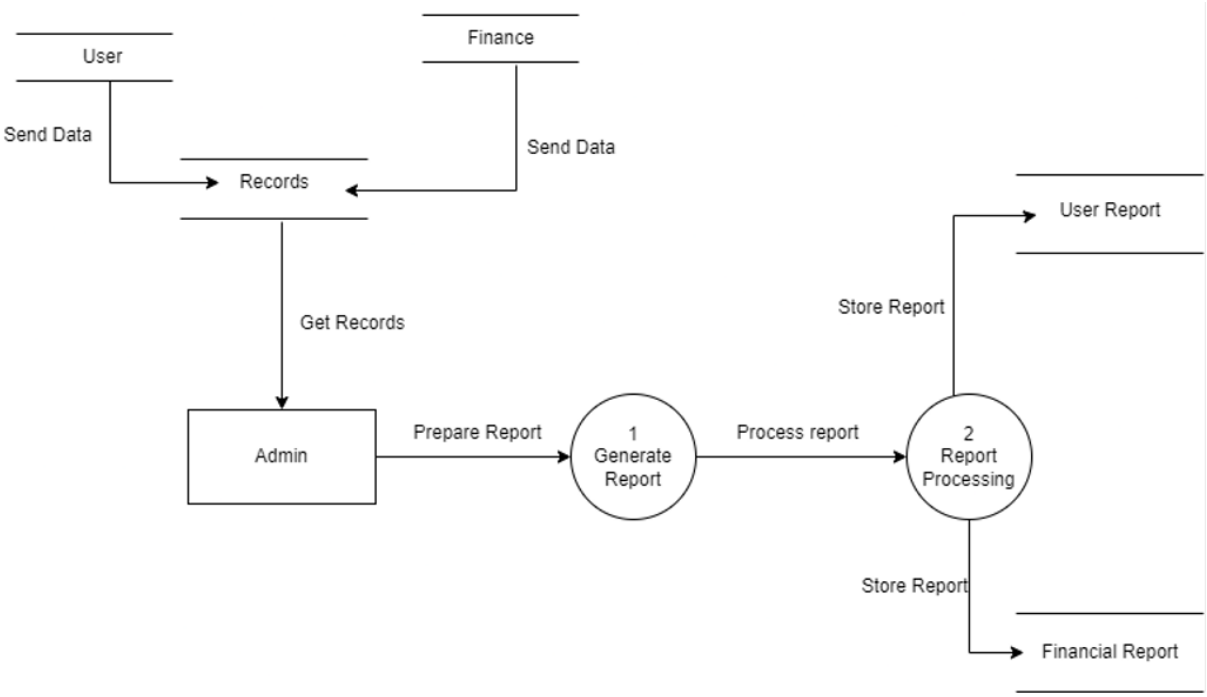

Figure 19: Level 1 DFD for Report Preparation

3.3.2.2 Level 2 DFD

The figure below illustrates the Level 2 Data Flow Diagram for Report Preparation. It shows that the generated report is stored in its specified data store which can then be viewed or displayed when necessary.

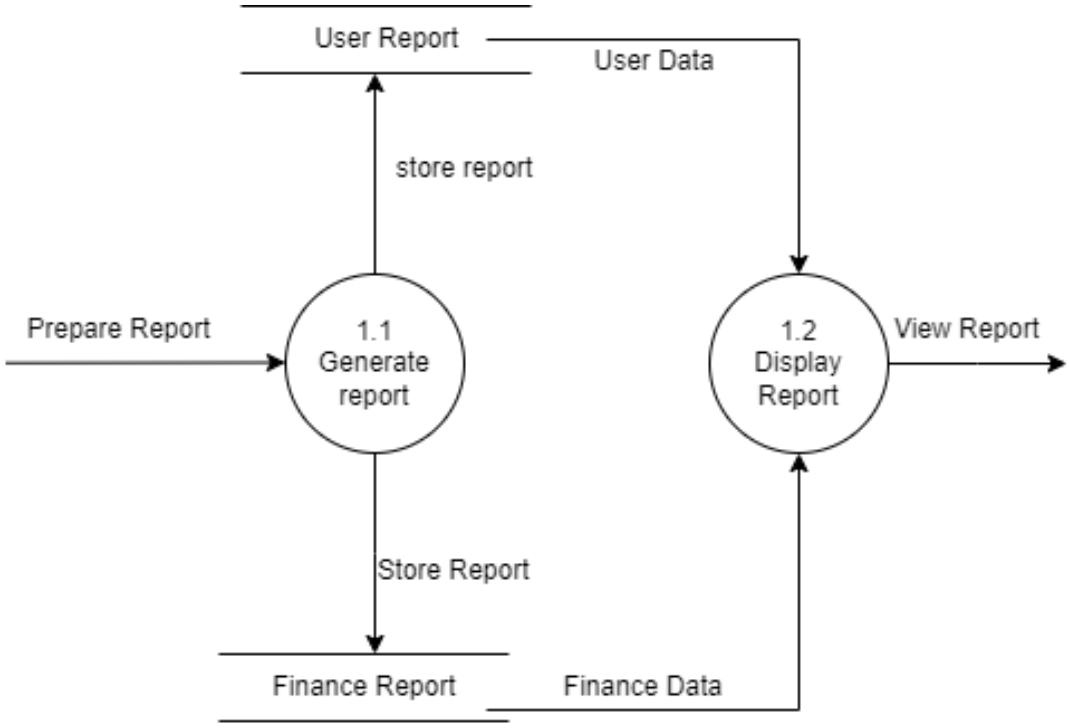

Figure 20: Level 2 DFD for Report Preparation

3.3.3 Design Specification

3.3.3.1 Structure Chart

The figure below is the structure chart for report preparation. It is broken down into different inputs, process, and outputs. The Generated Report sends user and financial data to Report Preparation. The generated data is then sent to Prepare Report, which then collects the data and processes the data turning it into information. The processed data is then sent to the Display Report which then displays the respective report when required.

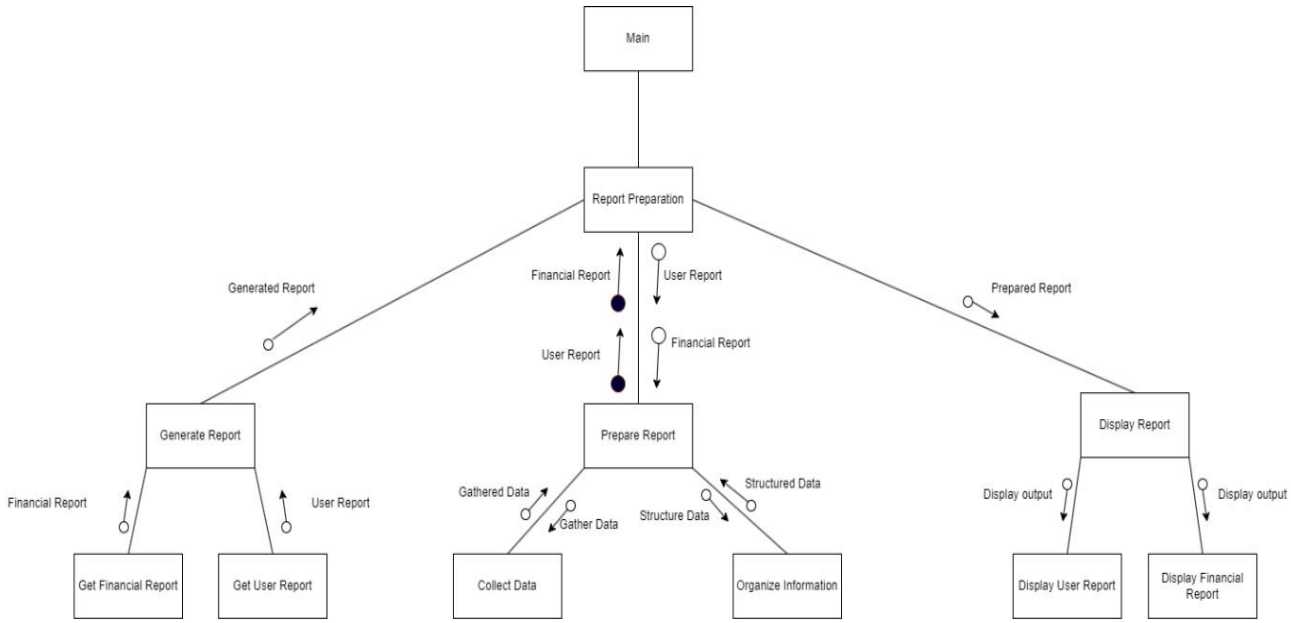

Figure 21: Structure Chart for Report Preparation

3.3.3.2 Module Specification

Module Name: Report Preparation

Purpose: This module generates financial report and user report. It collects the data from the user and the finance database. The admin then retrieves those data and generates a report. The generated report is then processed and stored in its respective database. The data can be displayed if necessary.

Pseudocode:

DO

Var financial_report = DB.get_financial_records()

Var user_report = DB.get_user_records()

Var prepare_report = DB.get(financial_report, user_report)

Var report = generate_report(prepare_report)

Display (Report)

END DO

Input parameters: user_report, financial_report

Output parameters: Report

Global Variable: DB

Local Variable: financial_report, user_report, prepare_report, Report

Calls: GET financial_report, user_report, prepare_report

Called by: Main

3.4 Certification exam (22067526 Kristan Dharel)

3.4.1 Environmental model specification

3.4.1.1 Context level diagram

The following context level diagram shows the certification data flow connection between the user and the admin. Here the user attends the examination where the questions are set by the admin. When user gives examination, the score is passed to the admin for evaluation. If the user can meet the criteria of the exam a certificate is issued in their name.

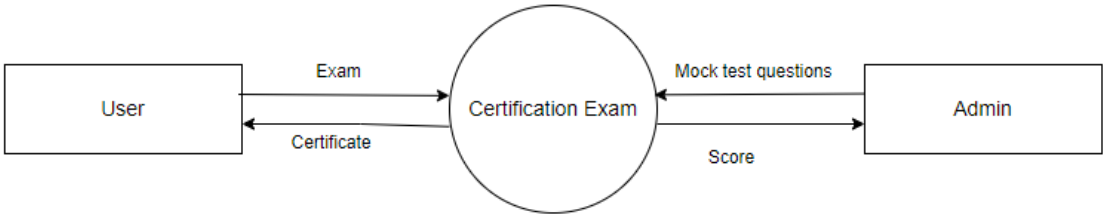

Figure 22: Context Level diagram for certification exam process.

3.4.2 Internal model specification

3.4.2.1 DFD level 1

The level 1 diagram explains how the user can obtain certificate. The admin updates course and the user select a suitable course and appears for the certification exam.

If the user can pass the examination the user receives a certificate which is further updated to user account as certification details. When the user account is updated, the user receives a certificate.

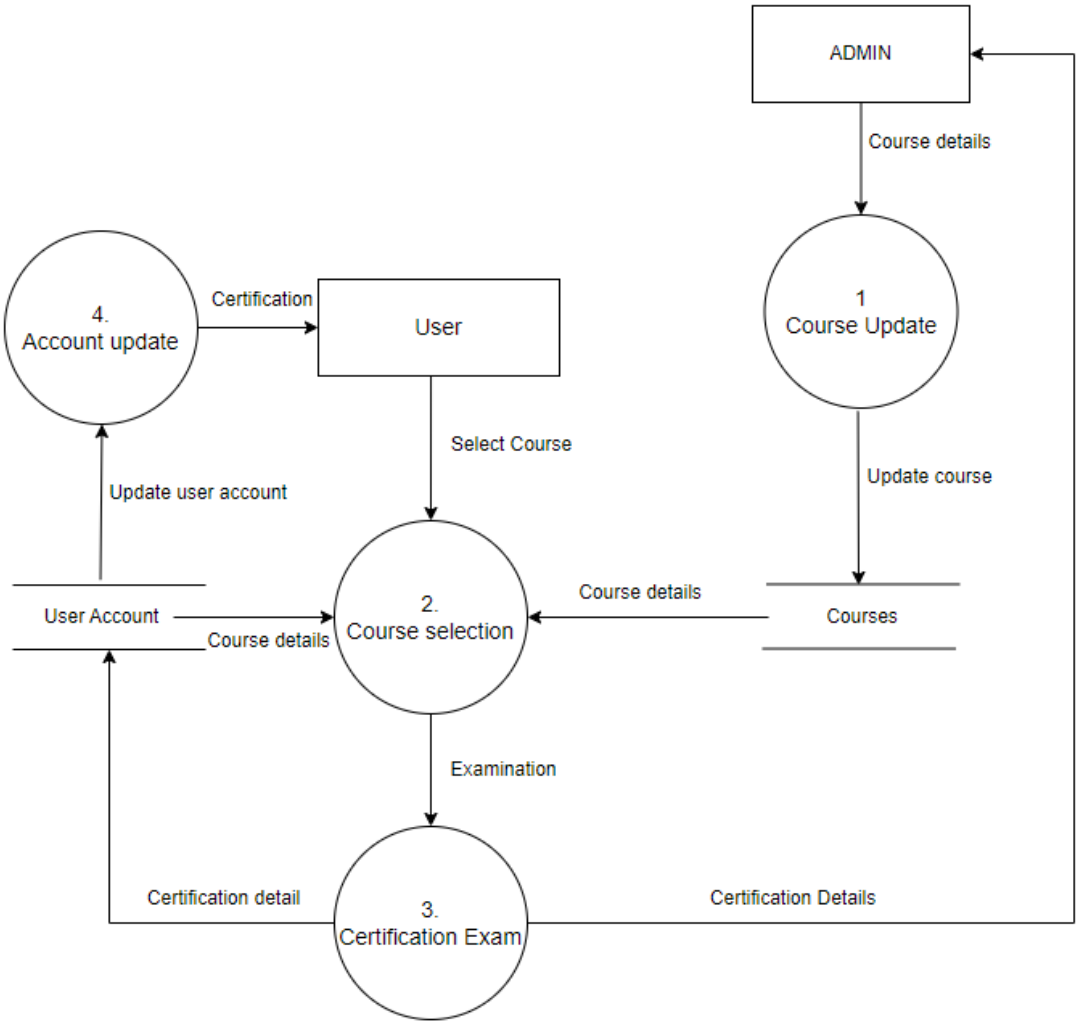

Figure 23 Level 1 DFD for Certification Exam process

3.4.2.2 DFD level 2

The level 2 data flow diagram further explain the process of certification. The user data is passed for certification. The user data contains course, scores, attendances obtained by the user. The detail is stored in user details and is further passed to certification criteria where the scores and attendance of the user is evaluated. If the user can meet the criteria of certification the user receives a certificate.

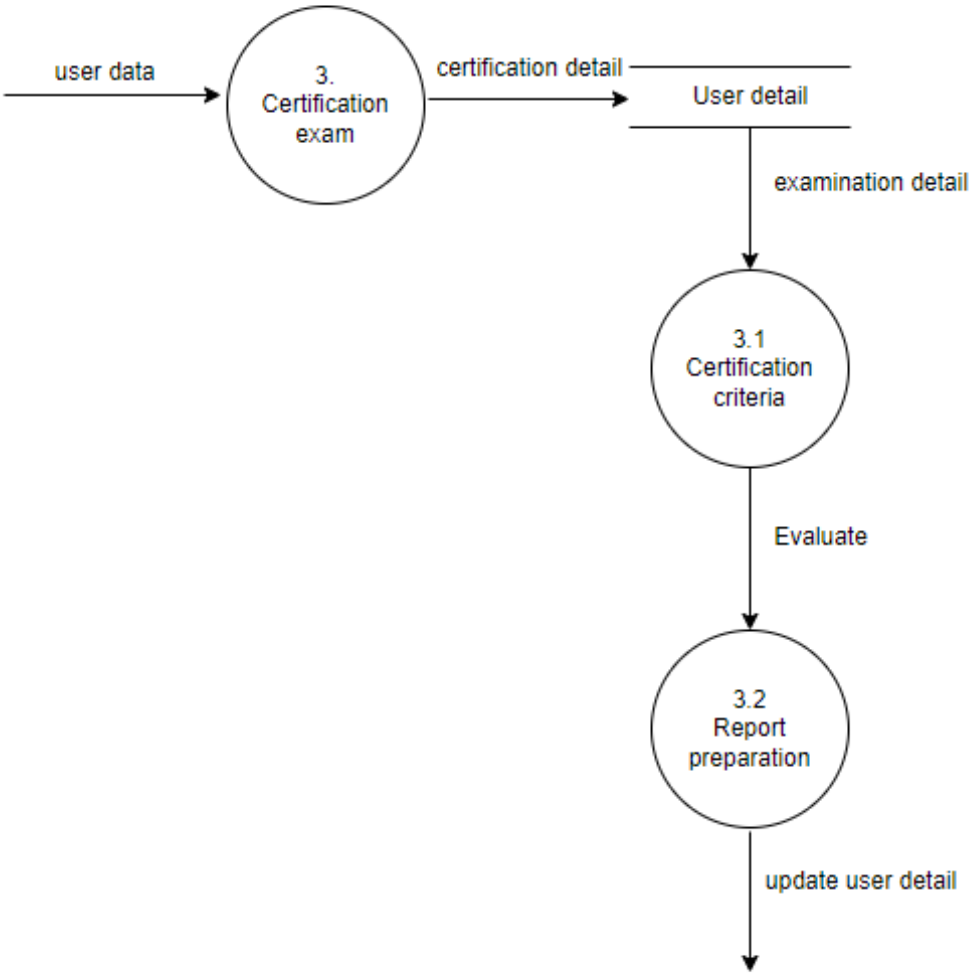

Figure 24: Level 2 DFD for Certification Exam.

3.4.3 Design specifications

3.4.3.1 Structure chart

The certification detail parameter sends details about certification to the certification criteria sub-module where the exam scores and attendance details are retrieved, and score and attendance details are sent to certification evaluation sub-module for evaluation. The score and attendance parameters are sent to its respective sub-module for evaluation. After evaluation, the control parameter is sent back to criteria evaluation after evaluating scores and attendance. If the criteria are met the evaluated control parameter of score and attendance is sent to certificate sub-module and is displayed in the certificate.

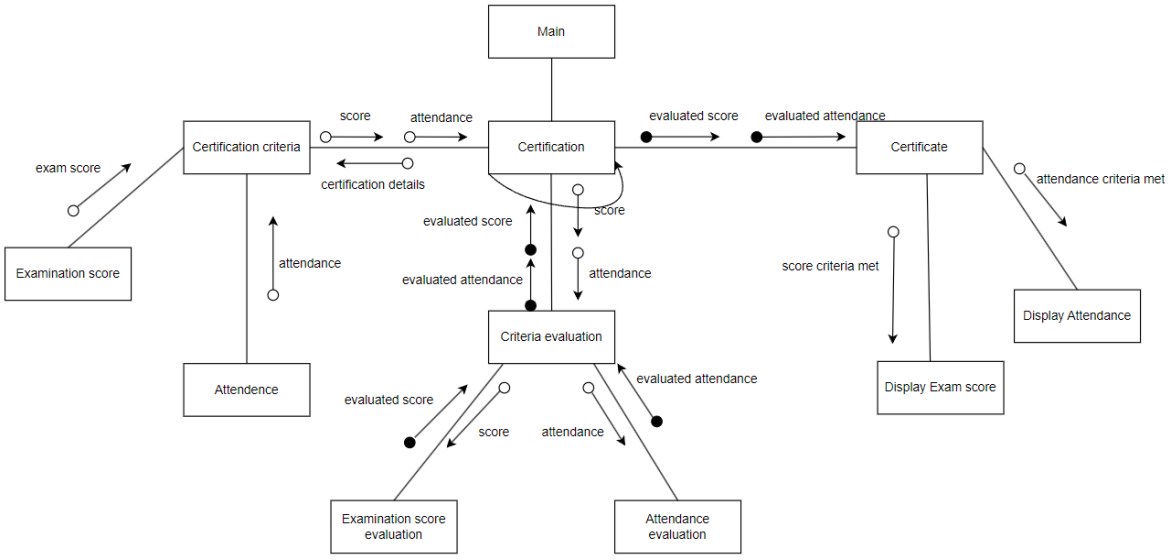

Figure 25: Structure Chart for Certification Exam.

3.4.3.2 Module specification

Module Name: Certification Exam

Purpose: The purpose of this module is to the completion of courses. It collects examination details which gives information weather the user has passed the exam or not. If the user fails to meet the criteria of the certification the user is required to give re-examination.

Pseudocode:

DO

Var examiner_details = DB.get_examiner_details()

Var certification_details = DB.get_certification_record()

Var score_info = DB.get_score_details()

Var attendance_info = DB.get_attendance_details()

Var evaluated_score_info = DB.post_evaluated_score_details()

Var evaluated_attendance_info = DB.post_evaluated_attendance_details()

Var report = generate_report(evaluated_score,evauated_attendance)

Display(report)

END DO

Input parameters: score_info, attendance_info

Output parameters: report

Global variable: DB

Local variable: examiner_detail,certification_detail,score_info,attendance_info,evaluated_score_info,evaluated_attendance_info,report

Calls:

GET examiner_detail,certification_detail,score_info,attendance_info

POST evaluated_score_info,evaluated_attendance_info

Called By: Main

3.5 Join the program (22067545 Pratik Karanjit)

3.5.1 Environmental model specification

3.5.1.1 Context level diagram

This context level diagram portrays the data flow connection between user, join program and admin. The admin would post course details which is further taken by the user. The user then selects the course out of the given options provided by the admin. The course selection details from the user can be viewed by admin. These data flows wrap up the context level diagram for the domain join program.

Figure 26: Join program's DFD level 0.

3.5.2 Internal model specification

3.5.2.1 DFD level 1

The level 1 data flow diagram explains how the user can join the program and the overall flow diagram. The user's registration details is passed by the user to a data store called user accounts. This checks the user details and returns back availability details and confirms the registration details.

The admin posts courses for the user which is initially stored in a data store named as Courses. These courses are viewed by user whose account details are passed on by user account data store. It also shows that the user can join the program every time when he/she is logged in. This means that user does not need to enter the registration phase every time he/she wants to join a program.

Finally, the user program details are passed on to program details data store which sends joined program details to the admin.

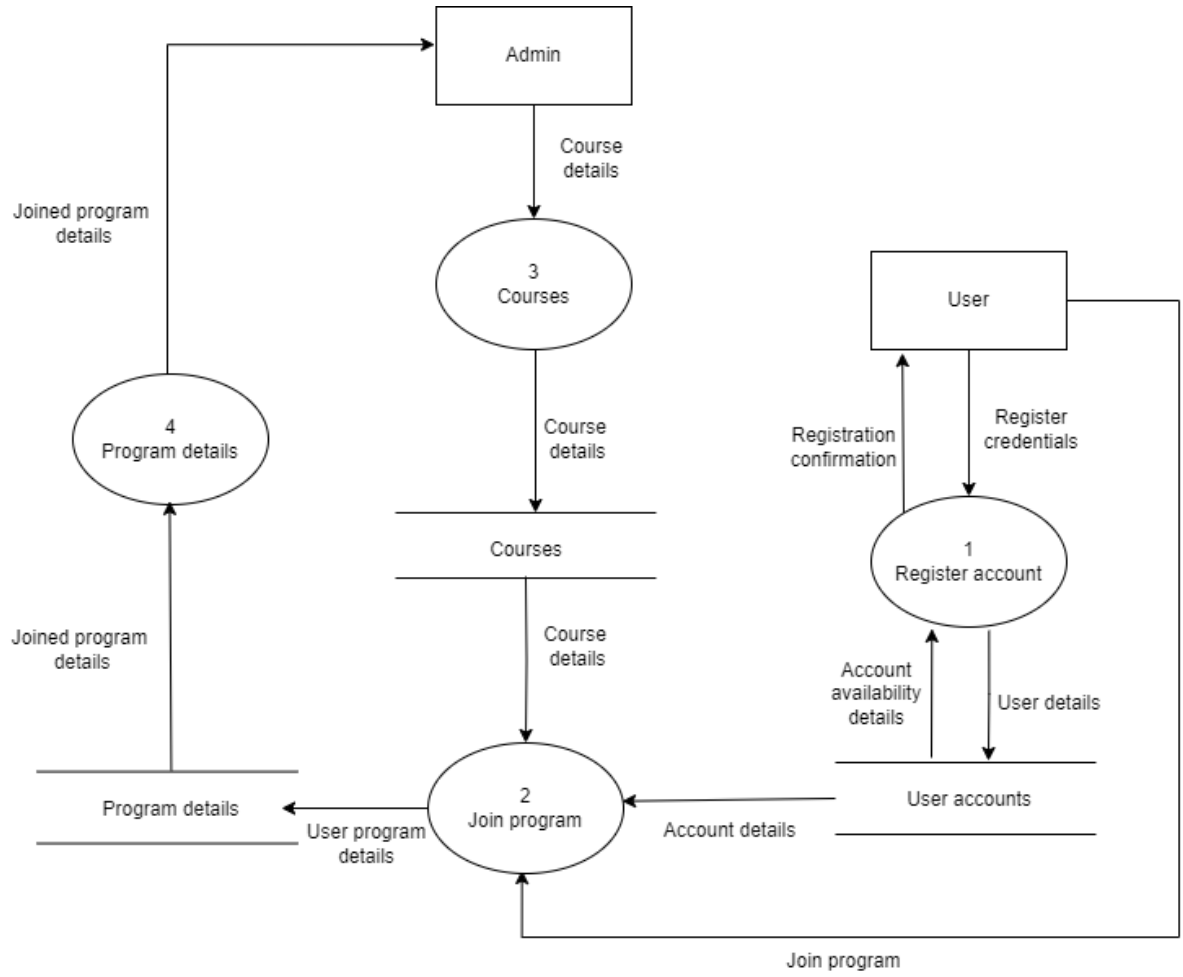

Figure 27:Join program DFD level 1.

3.5.2.2 DFD level 2

The data flow diagram level 2 explains further about the join program process. The balancing is done from the level 1 DFD which takes in user selected course, account details and course details. This passes on user program details to data store named as program details. Now, seat availability is checked of the provided courses so that the user can join the program. If there are seats available, the data is passed on to further modifications.

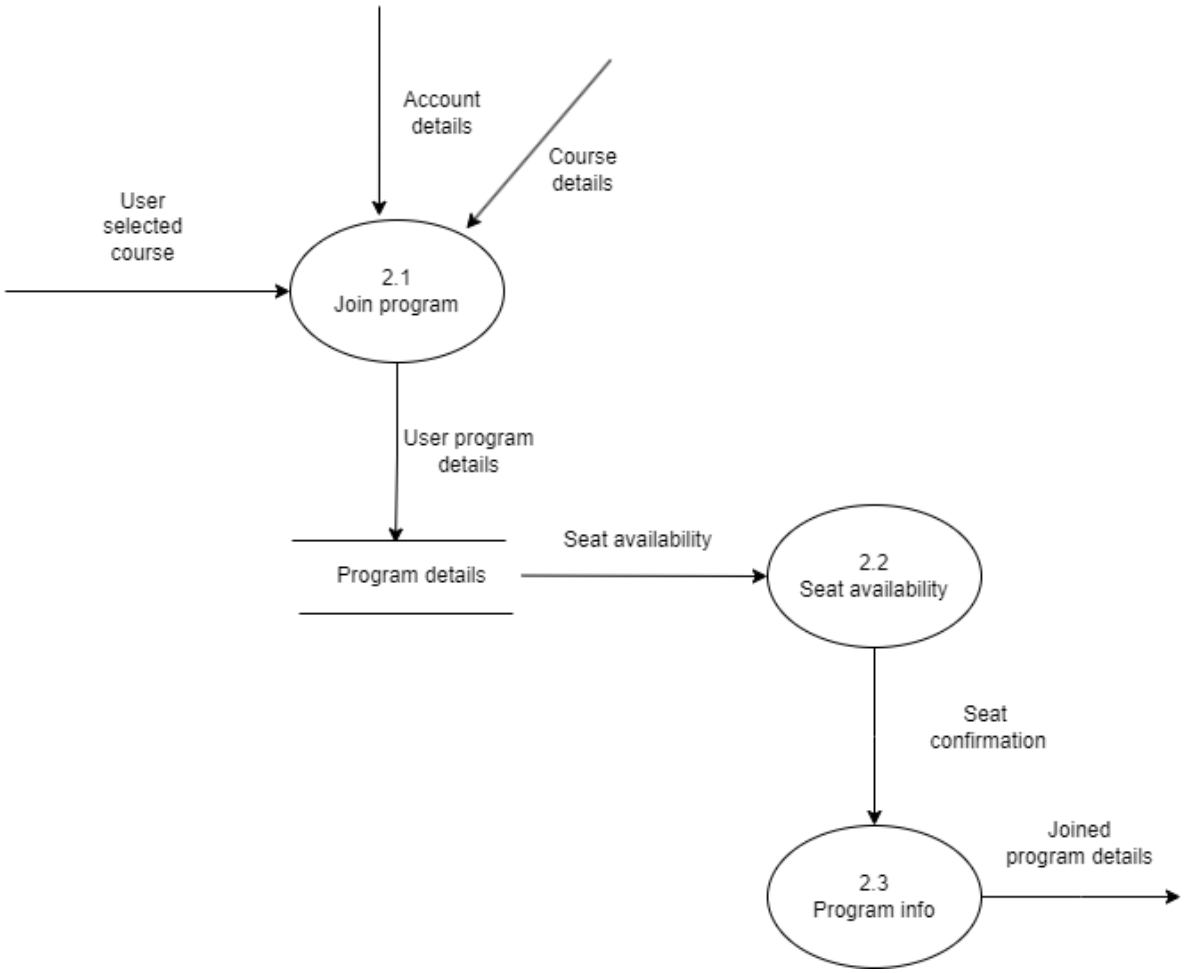

Figure 28:Join program DFD level 2.

3.5.3 Design specifications

3.5.3.1 Structure chart

In structure chart of join program module, the first parameter indicates program details flowing into join program module. This further divides into sub modules which indicates input, process, and output flow. The left module takes in input from the user, in this case it's the course user wants to enrol in. Control parameter indicates criteria of selecting course has been met. The main module is subjected to a loop which explains that a user can re join another course and the same process would continue.

In processing, i.e., second sub-module, the checking of available seats for that course is done. It returns the number of seats available and finally moves towards output. The user program details parameter indicates data flowing into the final module, output module. This holds a decision symbol which indicates that the chosen course could be any of the three provided ones that is, horticulture, agriculture and certification program.

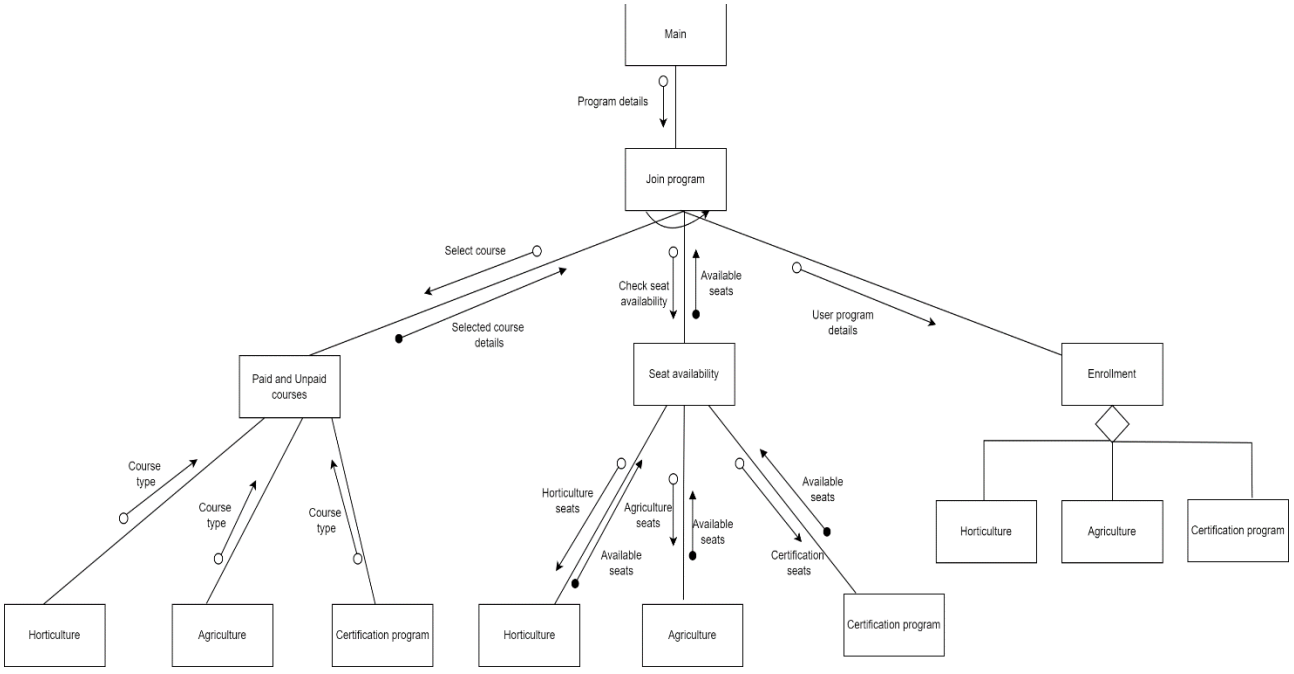

Figure 29: Join program structure chart.

3.5.3.2 Module specification

MODULE NAME: Join program.

PURPOSE: The purpose of this module is to get user details, courses from user and admin respectively and provide paid/unpaid courses. It also checks available seats for that course. Some of the courses it provides are horticultural, agricultural and certification exams. This module provides seamless communication between users and administrators, ensuring a smooth process for enrolment and course management.

PSEUDOCODE:

```
DO
    var customer_details = DB.get_customer_records()
    var course_info = DB.get_course_details()
    var course_type = DB.get_paid_unpaid_courses()
    var horticulture_seats = DB.get_horticuluture_seats()
    var agriculture_seats = DB.get_agriculture_seats()
    var certification_exam_seats = DB.get_certificate_seats()
    var chosen_course = DB.post_user_course()
    var report = generate_report(customer_details, chosen_course)
    Display(report)
END DO
```

Input parameters: chosen_course

Output parameters: report

Global variable: DB

Local variable: customer_details, course_info, course_type, horticulture_seats, agriculture_seats, certification_exam_seats, chosen_course, report

Calls: **GET** customer_details, course_info, course_type, horticulture_seats, agriculture_seats, certification_exam_seats

POST chosen_course

Called By: Main

4. Summary

This project report introduces a system crafted to meet the requirements of a Botanical Training Institute seeking diversification by selling short term courses related to horticulture for people that are interested in this field. In addition, the system also enables purchasing of plant at a very low price or even for free and also creating a platform for the interested pant enthusiasts. The system includes features such as user registration, purchasing of various plants, a payment facilitation for the customers to pay for the courses and plants, an expert recommendation for plant cultivation, a feature to prepare detailed reports, certification exams for the users enrolled in various courses, a forum for the users to create a community and engage in conversations about plants and a notification system through with users get applicable notifications.

5. References

GeeksForGeeks, 2023. *Structure Chart.* [Online]
Available at: https://www.geeksforgeeks.org/software-engineering-structure-charts/
[Accessed 29 12 2023].

LucidChart, 2023. *ERD.* [Online]
Available at: https://www.lucidchart.com/pages/er-diagrams
[Accessed 28 12 2023].

ReasearchGate, 2024. *Research gate.* [Online]
Available at: https://www.researchgate.net/figure/Sample-structure-chart_fig3_220281904
[Accessed 02 01 2024].

UC Merced Library, 2023. *Whats Is a Data Dictionary?.* [Online]
Available at: https://library.ucmerced.edu/data-dictionaries#:~:text=A%20Data%20Dictionary%20is%20a,part%20of%20a%20research%20project.
[Accessed 29 12 2023].

Wikipedia, 2023. *Structure Chart.* [Online]
Available at: https://en.wikipedia.org/wiki/Structure_chart#:~:text=A%20structure%20chart%20(SC)%20in,which%20contains%20the%20module's%20name.
[Accessed 29 12 2023].