LONDON METROPOLITAN UNIVERSITY

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(इस्लिङ्टन कलेज)

Module Code & Module Title

CS5002NI Software Engineering

Assessment Weightage & Type 20%

Group Coursework

Year and Semester 2021-22

Group Name: C12			
SN	**Student Name**	**College ID**	**University ID**
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I confirm that I understand my coursework needs to be submitted online via Google Classroom 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 mark of zero will be awarded.

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1. Introduction

This assigned coursework of Software Engineering (CS5002NA) module is the group work to be completed which consists of 5 members. This coursework contributes 20% to the overall marks for this module and involves Structured software engineering. This coursework mainly focuses on working in systematic order and demonstrates the knowledge to work in groups and complete task in a specified time frame. In this coursework, out of given 5 functions of the system to develop, each of them has been completed by each of the member in the group. Likewise, the context level diagram is also made of those particular selected functions individually as a part of environmental model specification. Similarly, the level 1 DFD and Level 2 DFD are also performed in group of that selecting functions selected before.

The main objective of this group coursework is to provide the value of teamwork for the common goal. This coursework helps us to learn the use of Data Flow Diagram (DFD), Structured Chart Diagram, Entity Relationship Diagram, Data Dictionary, Process secs and Module specs. To develop all of the charts mentioned above draw.io tool has been used.

2. Project Charter

Project Name: T-14 Academy System Software
Start Date:16th December 2021
Finish Date: 6th February 2022

Problem Statement:

The Project Charter outlines changes to the project's company strategies, significant success factors, product specifications, and accountabilities. The Charter is the outcome of T-14's alliance. By creating a firm basis for project management and establishing clear expectations, it increases the prospect of growth and development. The Charter will serve as the framework for measuring progress and tracking results. T-14 is a new company that has recently been established to provide football training to individuals of all ages. T14 has been requesting an update to the digital world since the advent of the COVID pandemic. First, a project charter has been proposed.

Project Overview:

T-14 is a brand-new company founded by a group of former national football players. It's a service dedicated to football training. For persons of various ages, the organization provides a wide range of training programs. For each age category, there are two types of training options: basic and intermediate. There are no requirements to enroll in Basic training. There are, however, some prerequisites that must be accomplished before enrolling in the intermediate program. Prior to enrolling in the intermediate level, however, there are several criteria that must be met. To be eligible for intermediate training, one must complete a series of football IQ exams and achieve a particular number of points. After reviewing the participants' total performance in both written and physical examinations, the trainer team determines if they are eligible to proceed in Intermediate

training. It provides Football Accessories at a lower cost than the market, as well as training opportunities.

T-14 Academy is likewise seeking for a web-based solution to help them run their business. As a result of the present Covid-19 outbreak, their demand for an online system has grown more urgent. They aim to keep their business operations as basic as possible in case they become physically unable to handle them. T-14 prefers to finish the entire application procedure online. They also want the tests to be taken entirely online.

Goals: The main goal of this project is to develop a completely online and admin-based system where the admins of the company can alter the data and information within the system. Here, a system must be developed enables online registration, add and update details of both staff and customers, deregister customer and generate report. Furthermore, implementation of admin-based system where admin can alter the information and data of the organization can be done through this system.

Objectives:

The objectives of this project are as follows:

- To complete the project in systematic order.
- To increase the revenue of the academy by 30%.
- To Manage all the business operation online via web portal.
- To distinguish the needed budget for this project.
- To work under the allocated time-frame.
- Well mapping of the projects by distinguishing the functionalities and nonfunctionality and work on them as required.

Estimated Budget: 10 lakhs

Timeline:

Functions	**Time-frame**
Enroll staff	1 week
Register Membership	6 days
Football Kit store	15 days
Report Preparation	4 days
Design exam test papers and practice test papers	9 days
Post exam notices and announcements	1 weeks
Take a mock exam	2 weeks

Scope

This is required because it outlines the Academy's procedures for registering staff, enrolling members, purchasing football kits, generating reports, making announcements, and taking mock examinations. It gives complete idea about how this feature will be achieved, and how the project will be completed, allowing it to fully comprehend their project. It provides a detailed description of how these features will be implemented and the project will be completed, helping the Academy to completely know their project.

Team Members:

1. Aakriti Lama
2. Salaj Subedi
3. Krishna Bahadur Khadka

4. Adarsh Sharma
5. Prajwol Kharel

3. SRS

3.1. Introduction

The Software Requirement (SRS) Format is a comprehensive specification and description of software requirements that must be met in order for a software system to be developed successfully. Depending on the type of requirement, these requirements might be both functional and non-functional (Madhurihammad, 2021). The purpose of this document is to collect, evaluate, and provide a comprehensive understanding of the whole **Football Academy** software system by articulating the issue statement in detail. However, while defining high-level product characteristics, it also focuses on the capabilities and demands of stakeholders.

- **Purpose of the document**

The document's purpose is to acquire and evaluate all of the many concepts that have surfaced in order to describe the system and its needs in terms of customers. It gives a thorough overview of the software solution, including its requirements and goals.

- **Scope of the document**

This document is required because it outlines the Academy's procedures for registering staff, enrolling members, purchasing football kits, generating reports, making announcements, and taking mock examinations. It gives complete idea about how this feature will be achieved, and how the project will be completed, allowing it to fully

comprehend their project. It provides a detailed description of how these features will be implemented and the project will be completed, helping the Academy to completely know their project.

- **Overview**

Because the Covid-19 has influenced the world's business and institutions, running a football academy is fairly challenging. As a result, the software for building a football academy includes online business tools that may assist players in becoming academy members and allow academy members to complete their mock tests through the internet.

General Description

The software allows the academy to operate their business online, allowing them to hire staff, issue post-exam messages and announcements, and take an online mock exam, as well as sell their items to members with a discount segment. Because of the online facility, both the academy and the consumer who wants to become a member may profit from this software. Customers can take their online mock exams from anywhere and schedule appointments for intermediate training and physical examinations.

3.2. Functional Requirements

1. **Online kit store**

   The system allows member and customer to buy the football associated item.
   The system allows the registered member to buy items in discounted price.
   The system allow user to search the items in the search panel.
   The system allow admin to add the items on the online store.
   The system allow user to sort the item available according to the price range.

2. **Register staff**

   The system shall enable admin to register staff in the academy.
   The system shall enable admin to show staff details.

3. **Terminate staff**

   The system shall enable admin to terminate staff from academy.

4. **Manage/Renewal staff Contract**

   The system shall enable admin to manage/renewal staff contract.

5. **Register student**

   The system allow customer to register themselves as a student and provide to choose basic or intermediate training.

6. **De-register Student**

   The system shall allow admin to de-register students.

7. **Generate Business Report**

   The system shall allow admin to generate overall business report based on the student's details, payment details, announcement and on exam report.

8. **Notifications/Announcement**

   The system shall allow admin to notify/announce result of the students who are rejected and qualified for the membership.

9. **Manage payment**

   The system shall allow admin to manage payment of the students, show payment details and store's earning.

10. **Conduct online exams/ appoint physical exam**

    The system allow admin to conduct the online exam for the customer who wants to get intermediate training.

11. **Design question/ physical drills tutorial video**

The system allow admin to design, publish question related to the football and provide tutorial video for practice.

3.3. Non-Functional Requirements

• **Design and implementation Constraints**

- **Hardware limitation**

  Since Academy software is a web application, it requires hardware which supports a minimum of 1.9 GHz processor, 2 GB RAM, bandwidth larger than 50 KBps, and latency less than 150 ms.

- **Operating System constraint**

  Windows 11, Windows 10, Windows 6.1, and the most current two publicly published versions of Mac, as well as recent versions of Android and Apple devices, are all supported operating systems for rendering Web Academy applications.

- **Developer option**

  DevOps deployment approach was used to develop the Academy application because it focuses on reducing time to market, lowering new release failure rates, shortening the lead time between updates, and minimizing interruption while optimizing dependability. Using this methodology, Customer satisfaction, product quality, and staff productivity and efficiency will be improved.

- **Design Constraints**

  The system shall use the MySQL Database to keep the academy data in a managed form.

- **External Interface Required**

- **User Interface**

  The user interface of the software must be compatible with any browser that allows users to access the system, such as Internet Explorer, Safari, Mozilla, or Chrome.

- **Hardware interface**

  Since the application must operate over the internet, the system will require all of the hardware necessary to connect to the internet.

- **Software interface** ○ The academy system software shall communicate with staff panel to register, renewal contract, manage and terminate staff of the academy.

- ○ The academy system software shall communicate with online login panal to give login access to the customer and admin/staff.
- ○ The academy system software shall communicate with student panel to register and deregister students to the academy either for basic or intermediate training.
- ○ The academy system software shall communicate with Report to generate report related to the business.
- ○ The academy system software shall communicate with notification /announcement panel notify and announce result of the students

- ○ The academy system software shall communicate payment panel to manage the student payment. ○ The academy system software shall communicate with store panel to provide online items, update items, manage payment of purchase, discount, and availability of the items.

- ○ The academy system software shall communicate with join the academy panel to allow students to take exams, tests and providing preparation materials.

- **Communication interface**

  The HTTP protocol will be used for internet communication, while the TCP/IP protocol suite will be used for intranet communication.

- **Device supported**

  Anyone with a web portal or a mobile phone with an internet connection may access the Academy software and use its services because it is an online business software.

- **Payment gateway**

  Students who wish to be admitted to the academy can pay their fees either online or in person. They will be notified as soon as their payment is received.

• **Other Non-Functional Requirement**

- **Performance and server**

  The software caches and compresses data, allowing the web to load quicker. After the software is developed, it will be up to date, and it will employ a load balancer to increase the site's security and speed.

- **Security**

  In our system software we have used up-to-date encryption, demanding adequate authentication, regularly patching known vulnerabilities, and maintaining excellent software development which makes safeguarding web apps against exploitation.

- **Backup**

In our system, the program RunCloud Backup is used to backup our web application, which allows us to manage the problem quickly if the server goes down or if there is a change in the application that causes the site to go down.

- **Goals of Implementation**

  With internet connectivity, the Academy may utilize the software to manage their system and conduct business online. In addition, customers who wish to become members may quickly enroll in basic or intermediate training and complete online assessments.

  In the development of this software DevOps deployment method is used. The version control mechanism makes it simple to upgrade the software. The developer may quickly alter the code and add functionality as the user's needs evolve.

4. Group Tasks

4.1. Environmental model specification

4.1.1. Context Level Diagram

It's also known as a context diagram. The system is depicted as a single process with external entities, and the view is intended to be simplified. The entire system is represented as a single bubble, with incoming and outgoing arrows indicating data input and output (GeeksforGeeks, 2020).

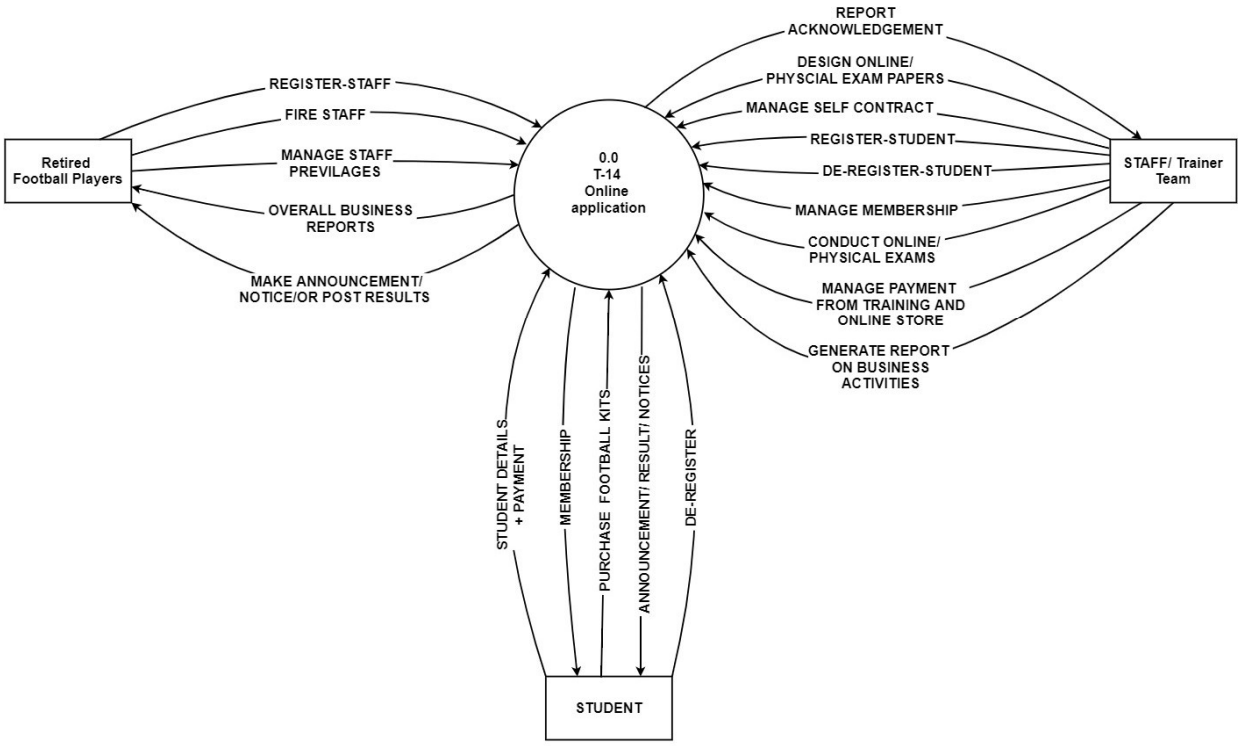

Figure 1 Context Diagram for whole System.

4.1.2. Level 1 Data Flow Diagram

Using 1-level DFD, the context diagram is broken down into multiple bubbles/processes. At this level, the system's primary functions are highlighted, and the high-level process of 0-level DFD is subdivided (GeeksforGeeks, 2020).

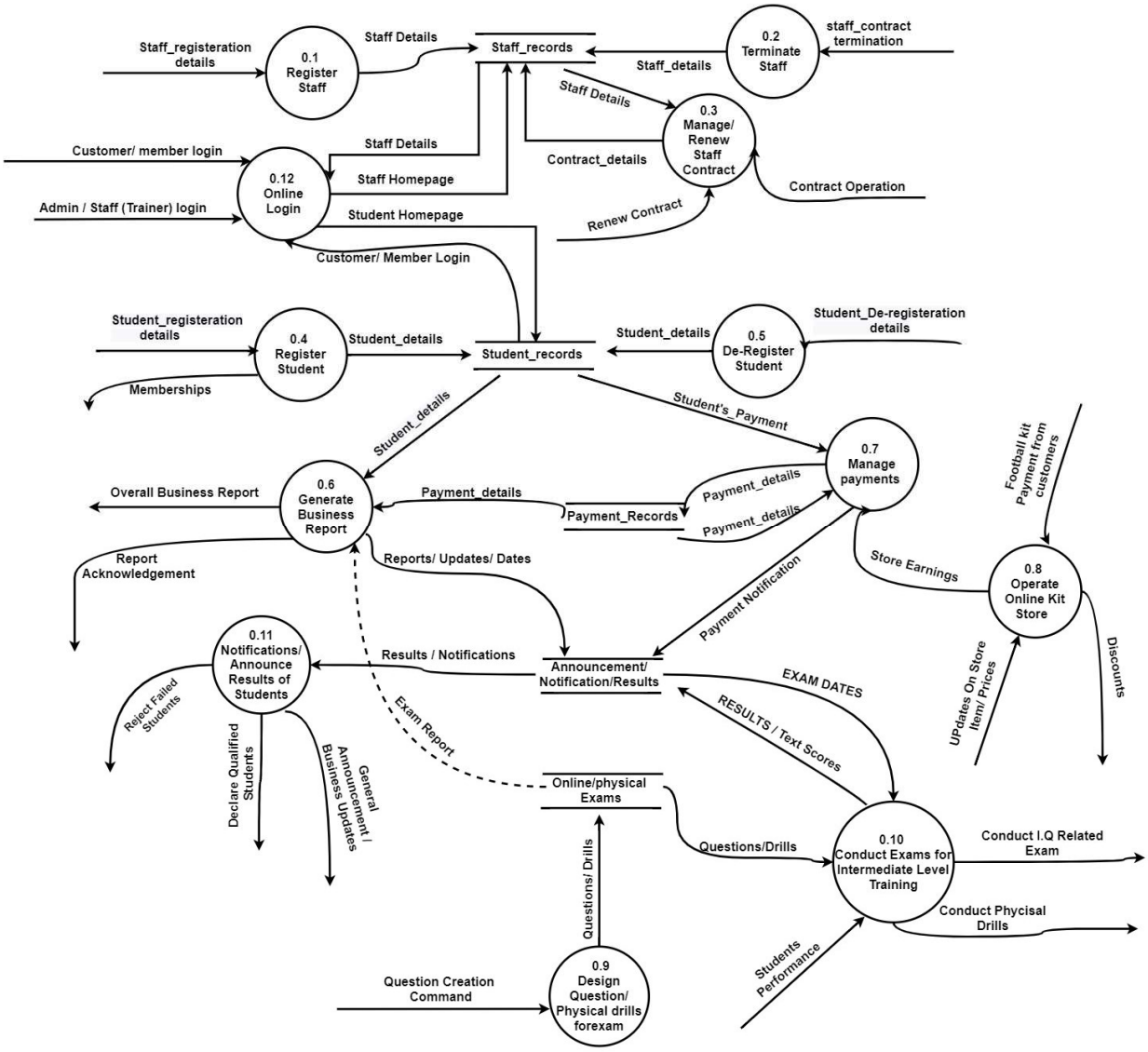

Figure 2 Level 1 DFD for whole system

4.1.3. Level 2 Data Flow Diagram

DFD's second level delves deeper into the aspects of the first level. It can be used to plan or record system details.

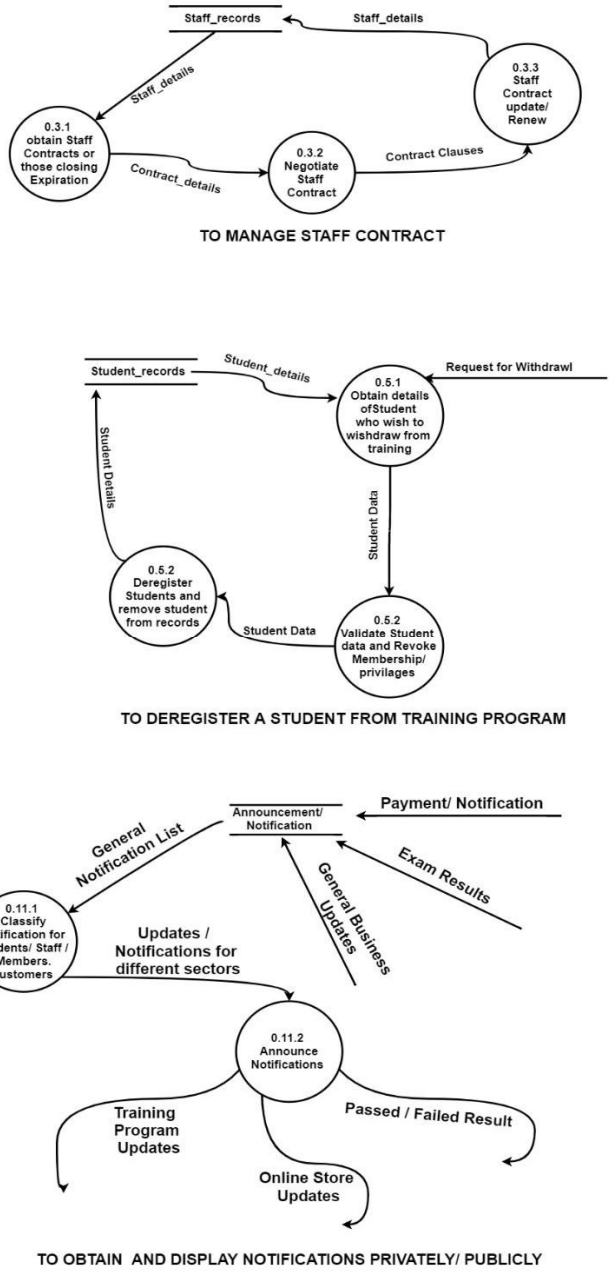

Figure 3 Level 2 DFD for whole system

4.2. Internal model specification

4.2.1. Entity Relationship Diagram (ERD)

An Entity Relationship Diagram (ERD) is a type of flowchart that depicts how "entities" in a system interact with one another, such as people, objects, or concepts. ER Diagrams

are most commonly used in software engineering, business information systems, education, and research to design or debug relational databases. They are also known as ERDs or ER Models because they use a predefined set of symbols to depict the interconnectedness of entities, relationships, and their attributes, such as rectangles, diamonds, ovals, and connecting lines (Javatpoint, 2021).

Entity:

An entity is any identifiable real-world object, animate or inanimate. A rectangle represents an entity in an ER diagram. In a school database, students, teachers, classes, and courses offered, for example, can all be treated as entities. All of these entities are defined by attributes or properties.

Attribute:

It is a single-valued property of either an entity-type or a relationship-type. A lecture, for example, may have the following attributes: time, date, duration, location, and so on. An Ellipse is used to represent an attribute in ER Diagram examples.

Relation:

The association of entities is referred to as a relationship. Relationships are represented by the diamond-shaped box. A department, for example, is where an employee works, and a course is where a student enrolls. In this context, works at and enrolls are referred to as relationships.

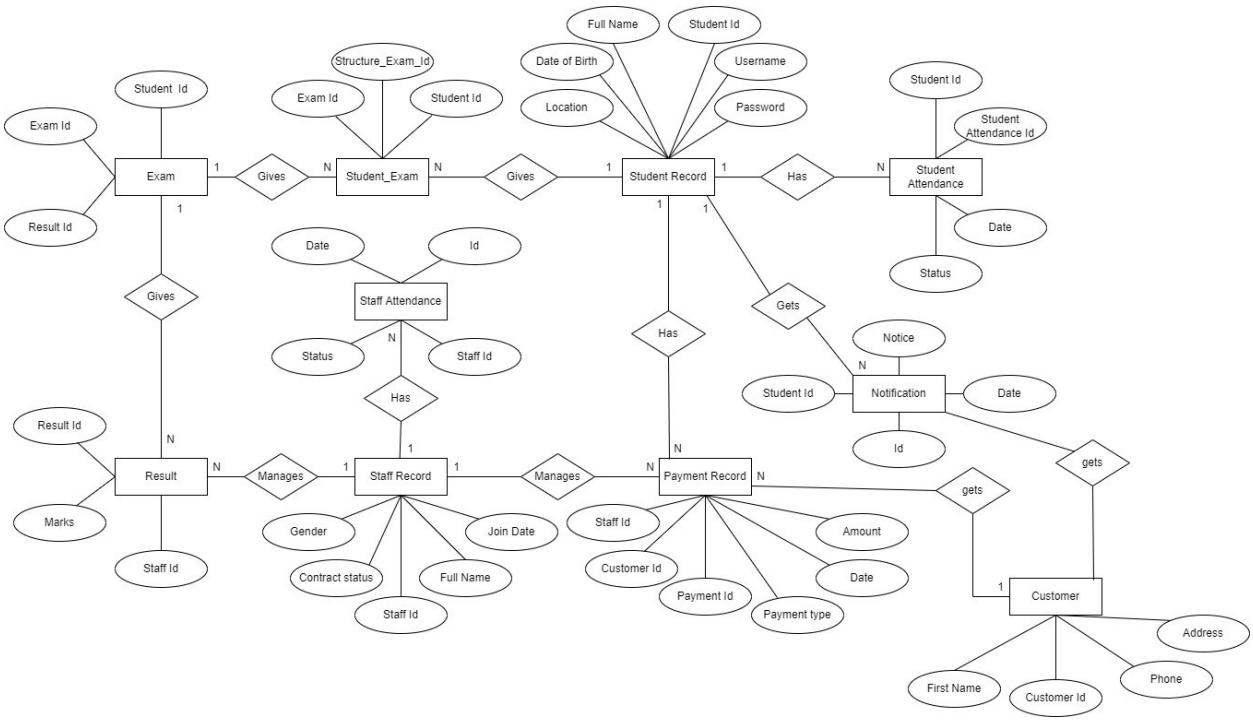

Figure 4 Entity Relation Diagram of whole system

4.2.2. Data Dictionary

A data dictionary is a collection of data element and model names, definitions, and attributes. The metadata of the database is contained in a data dictionary. These components are then put together to create a database, a research project, or an information system (Derda, 2020). The following are some of the most common data dictionary elements, though there is some variation:

- Attribute name
- Attribute type
- Entity-relationship
- Reference data
- Rules for validation, schema, or data quality
- Detailed properties of data elements

- Physical information about where data is stored

There are two types of data dictionaries: active and passive. Active data dictionaries are tied to a specific database, making data transfer difficult, but they update automatically with the data management system. Passive data dictionaries aren't tied to a specific database or server, but they must be manually maintained to keep metadata in sync (Derda, 2020).

Result
Result Id = Integer
Marks = String
Staff Id = Integer

Staff Record
Gender = String
Contract status = String
Staff Id = Integer
Full Name = String
Join Date = Date

Payment Record
Staff Id = Integer
Customer Id = Integer
Payment Id = Integer
Payment type = String
Date = Date
Amount = String

Notification
Id = Integer
Date = Date
Student Id = Integer
Notice = String

Staff Attendance

Status = String
Staff Id = Integer
Date = Date
Id = Integer

Exam
Exam ID = Integer
Result ID = Integer
Student ID = Integer

Student Exam
Exam ID = Integer
Structure Exam Id = Integer

Student Record
Student Id = Integer
Full Name = String
Date of Birth = DOB Location
= String
User Name = String
Password = String

Student Attendance
Student Id = Integer
Student Attendance Id = Integer
Date = Date
Status = String

Customer Record
First name= String
Customer ID = Integer
Phone= Integer
Address= String

4.2.3. Process Specifications (Pspecs)

A process specification is a method of describing, analyzing, and explaining the logic and formulas that are used to generate output data from process input data. Its goal is to lay out regulatory requirements and procedures as they are implemented. For highquality, consistent data, clear and thorough process specifications are required. A process specification eliminates ambiguity, allowing an individual or organization to obtain a precise description of completed tasks and accomplishments as well as validate system design, such as the data dictionary and data flow diagrams (Techopedia, 2012).

Process A

Number: 0.3.1

Name: Obtain Staff Contracts or those closing Expiration

Description: This process obtains all the details of staffs and gives out only contract details of staffs

Input Data Flow: Staff Details Output

Data Flow: Contract Details Process

Logic:

- Get staff details of all the staffs from Staff records Database
- Filter only details about contract and temporarily save it
- Contract details is passed to next sub process (0.3.2)

Process B

Number: 0.3.2

Name: Negotiate Staff Contract

Description: This process assists to decide about the renew of contracts of staff
Input Data Flow: Contract Details Output

Data Flow: Contract Clauses Process

Logic:

- Staff contracts information is obtained from parent process
- Each staff is placed on negotiation process about the renew of contract
- Based on negotiation, new contract clauses are passed to next sub process (0.3.3)

Process C

Number: 0.3.3

Name: Staff Contract update/ Renew

Description: This process helps renew the contracts of the staffs after negotiation

Input Data Flow: Contract Clauses

Output Data Flow: Staff Details Process

Logic:

- Contract clause is obtained from parent process
- Based on new contract clause, new contract is made and signed
- Renewed staff contracts are passed to staff records database

Process D

Number: 0.5.1

Name: Obtain details of Student who wish to withdraw from training

Description: This process helps on validation of student data and student request

Input Data Flow: Student Details, Request for Withdrawal

Output Data Flow: Student Data Process

Logic:

- Receives all the details of the staff from parent process
- Receives withdrawal request from the parent process

- Compare those two and only store the details of those staffs who wish to withdraw from training program
- Above information is then passed to next sub process (0.5.2) **Process E**

Number: 0.5.2

Name: Validate Student data and Revoke Membership/privileges

Description: This process helps in the revoke of the membership or some privileges

Input Data Flow: Student Data with request

Output Data Flow: Student Data Process

Logic:

- Receives the details of the staff who wish to withdraw from the program from parent process
- Based on staff request, this process validate those students and revoke their membership or privileges.
- Those same received data is passed to next sub process (0.5.3)

Process F

Number: 0.5.3

Name: Deregister Students and remove student from records

Description: This process removes students data form database based on their request of withdrawal

Input Data Flow: Updated student data Output

Data Flow: Updated student details Process

Logic:

- Obtains newly updated staff details from parent process
- Those data are updated on database too

Process G

Number: 0.11.1

Name: Classify notification for students/ Staff / Members. Customers

Description: This process helps on classification of general notification list

Input Data Flow: General Notification List

Output Data Flow: Updates / Notifications for different sectors Process

Logic:

- Get all the notification
- Filter notification based on for students or staffs or members
- And output those notifications to next sub process (0.11.2)

Process H

Number: 0.11.2

Name: Announce Notifications

Description: This process helps in announcement of notifications

Input Data Flow: Updates / Notifications for different sectors

Output Data Flow: Training Program Updates, Online Store Updates Passed / Failed Result

Process Logic:

- Obtains notification based on destination and features
- And forward those notification to specified person with specified privileges.

4.3. Design specification

4.3.1. Structure Chart

The Structure Chart depicts the hierarchical structure of modules. It divides the entire system into lowest functional units and describes the functions and sub-functions of each module in more detail. Structure Chart divides the system into black boxes (functionality of the system is known to the users but inner details are unknown). Inputs are fed into the black boxes, and corresponding outputs are created (GeeksforGeeks, 2019).

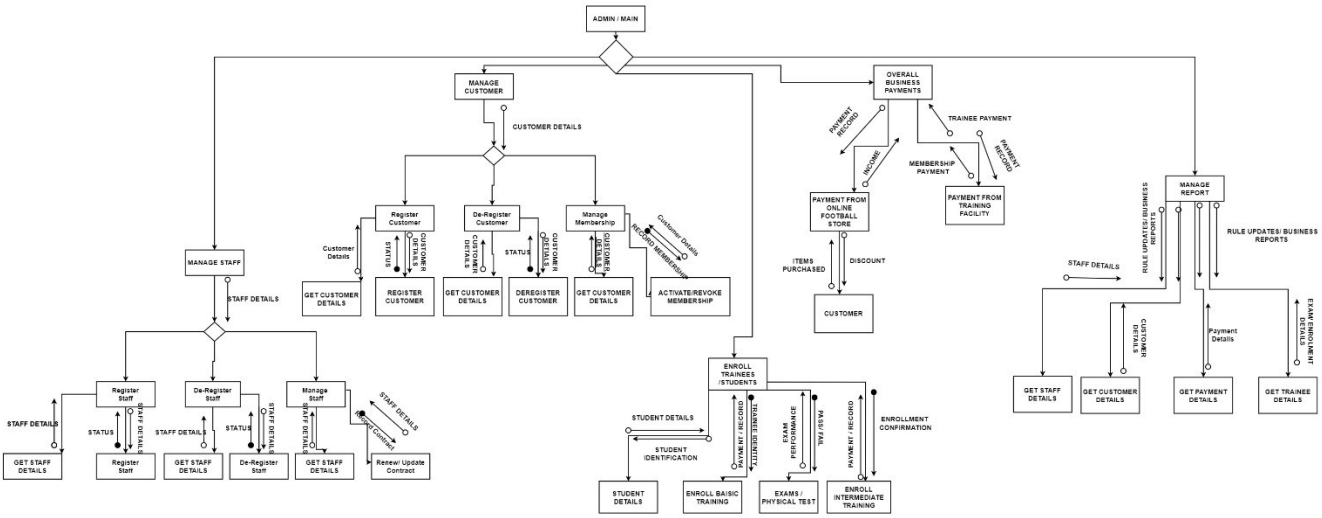

Figure 5 Structure Chart for whole System

4.4. Assignment diary

4.4.1. Omissions / Inconsistencies

- The system doesn't include the data of online store items and concludes them as just an external entity to the main T-14 training program
- The system doesn't mention if a customer has to be a member or a member has to be a student.
- Since the scenario is based on mainly the training program it doesn't include the details of payment such as price, items from customers when buying items from the online business store.

4.4.2. Assumptions

To remove the above-mentioned omissions and inconsistencies and to make the system efficient and more cohesive, the following assumptions were made:

- An Individual is a customer if he wants to enroll in training or buy kits.
- Student/ trainee are enrolled in training program.
- Staff can be hired fired or their contract can be updated by the admin.
- Attendance system has been implemented for both staff and Students.
- Customers must register to join the training program or get membership • Automatically de-register a student/ member after 2 months of inactivity.
- Automatically De-register a staff after a month of un Noticed leave.
- To reactive membership, training program or Staff Job, a customer/ Staff has to go through the entire process of new registration again.

- Staffs maintain payment records for Training program as well as online business.
- Staffs prepare Questions/ physical drills for intermediate training and send out notice.
- Admin can register/terminate or manage contract of any staff or customer.
- Staffs generate departmental reports of different sectors of the business and send it to admin.
- The admin creates overall general Business Report and give out notices and updates on business rules/ implementation.
- A student can choose their training program but must pay before they are enrolled in any of the program.
- A customer can deregister themself from membership or training program through the help of a staff.
- Staff details Include - Name , Join date , Gender , Salary , position , Staff Id
- Customer details incluse - Name , DOB , Location , Username , Student_id(if student), customer_id.
- In order to be a staff member one has to have accepted qualifications and is hired once an admin accepts it.
- Customers can Login Online. Students can also login online but Physical tests are conducted in the training facility.

4.4.3. Group Member Responsibility

Group Member	Responsibilities
Krishna Bahadur Khadka	• Work on individual task for **Register Membership.** • Work on SRS (Structure Requirement Specification). • Work on Assignment Diary of the report. • Contributed to assumptions part of the report.
Prajwol Kharel	• Work on individual task for **Report Preparation**. • Design the Entity Relationship diagram. • Work on Data Dictionary. •Work on pspecs (Process Specification) for elementary Process.
Adarsh Sharma	• Work on individual task for **Take a mock exam**. • Provide direction, instructions and guidance to team members. • Contributed to summary portion of the report documentation. Monitor the work progress and re-align the project on track. Work on formatting part of the report.
Aakriti Lama	• Work on individual task for **Purchase Football Kits**. • Work on Project Charter. • Worked on Introduction part of Coursework. • Worked on Process Specifications of the whole system. • Worked on Introduction portion of the report documentation.

Salaj Subedi	• Work on individual task for **Enroll Staff Member.** • Work on Structure Chart and assumptions. • Mock the designs of DFD level 0 to level 2 of the whole system. • Contributed to assignment diary portion of the report.

4.4.4. Meeting Minutes

Date	Time	Location	Discussions
2021/12/21	9:00 AM To 11:30 AM	UK Block	we examined the coursework topic and divided the task among the group members.
2021/12/24	1:00 PM To 3:30 PM	Nepal Block	A task plan was created, as well as a requirement analysis. We went through the prerequisites for the Academy Application in extensive detail.
2021/12/27	7:00 AM To 8:30 AM	Nepal Block	The ERD, DFD, Data Dictionary, and organization chart for the complete system were designed by all group members as a cooperative task. We met with our module instructor to clarify any questions we had regarding the assumptions and individual tasks.
2021/12/30	12:30 PM To 2:00 PM	Nepal Block	We try to design our system and include as many features as possible, as well as the system's structure chart.
2021/12/31	8:00 AM To 10:30 AM	UK Block	We showed our work to our instructor and discussed the system's assumptions and omissions.
2022/1/2	7:00 AM To 10:00 AM	Nepal Block	We checked through our individual tasks with each other in the group and worked out any challenges that arose.
2022/1/2	7:00 AM To 10:30 AM	UK Block	We talked with our instructor to address our concerns and questions about the work, and we worked together as a group to resolve the issues.

2022/1/2	8:00 AM To 11:30 AM	Nepal Block	We keep meticulous records of all of our work in word file.
2022/1/3	9:00 AM To 11:30 AM	UK Block	Before submitting in the group assignment, we verified our coursework documents and made sure everything was in order.

5. Individual Task

5.1. Register membership

5.1.1. Environmental model specification

Context Level Diagram

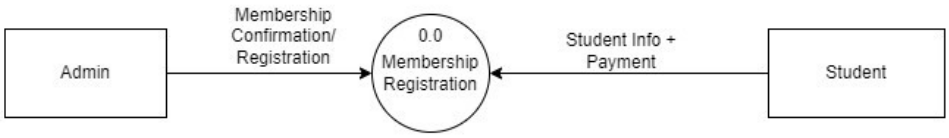

Figure 6 Context Level Diagram for Membership Registration

The above figure represents the Context Level Diagram (DFD level 0) for the membership registration process. It shows the registration and confirmation is done by admin. The

interested student can provide their details and make payment to get the membership of the Academy.

5.1.2. Internal model specification

Level 1 DFD

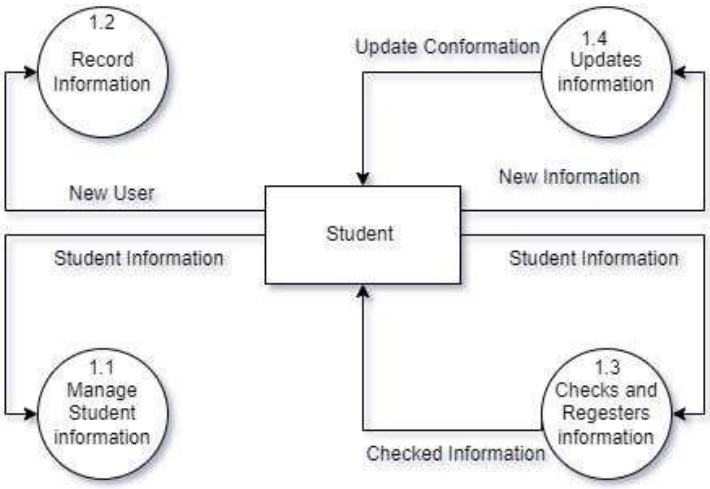

Figure 7 DFD Level 1 for Membership Registration

The above DFD represent the process taken during registration of membership. It involves adding of new user manage their information, check the registered one and update their new information.

Level 2 DFD

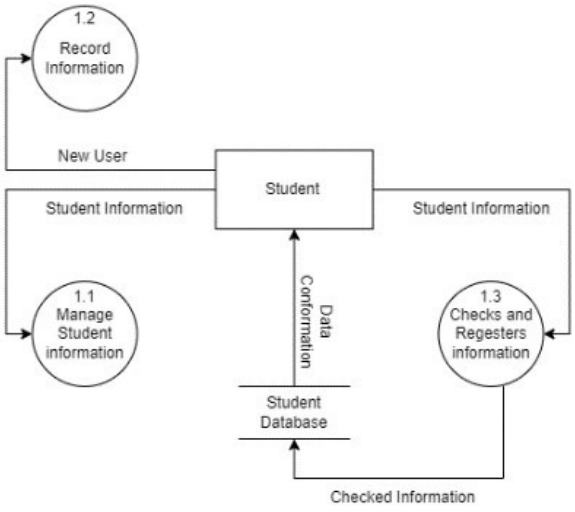

Figure 8 DFD Level 2 of Membership registration

The fundamentals of the 1-level DFD are expanded upon in the 2-level DFD. The graphic above shows the DFD Level 2 of Membership Registration procedure, which includes the addition of a student database to hold student information. The check and register information procedure validate the members' data in the database and confirms their participation in the academy.

5.1.3. Design specification

Structure Chart

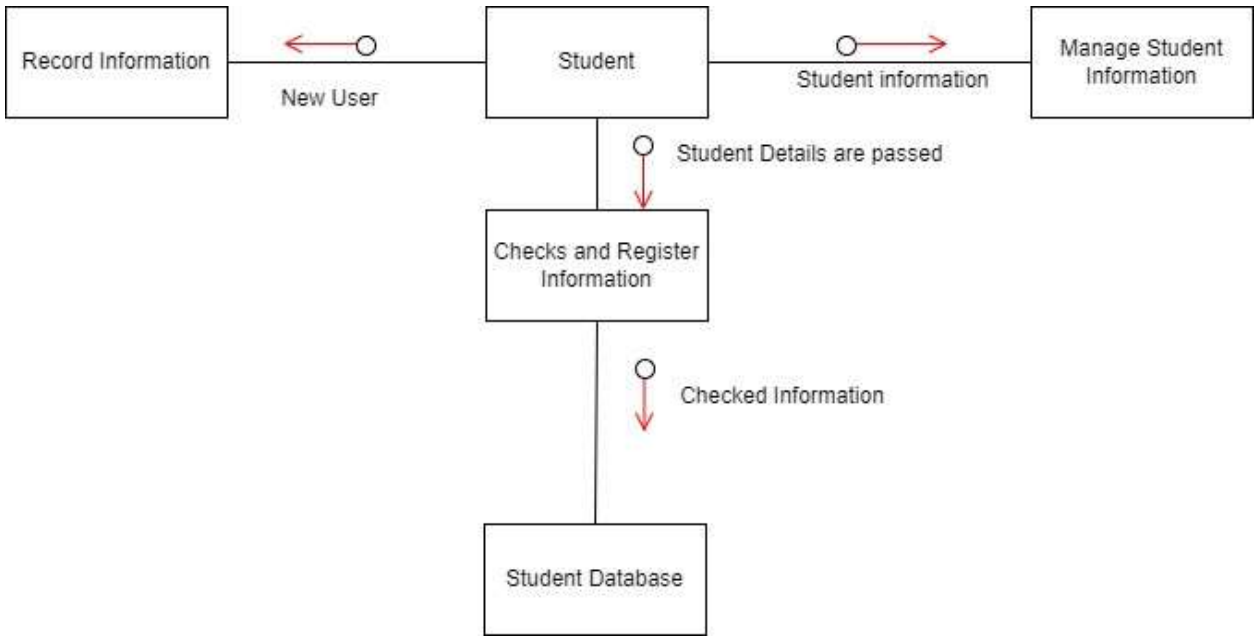

Figure 9 Structure Chart of Membership Registration

Module Specification

MODULE NAME: Membership Registration

PURPOSE: In this model students who are willing to be member of the academy can register themself by providing their details and payment which will be stored in the system database.

Pseudocode:

START

Var name = INPUT (“Enter Full Name”)

Var DOB = INPUT (“Enter Date of Birth”) Var

User = INPUT (“Enter Username”)

Var Location = INPUT (“Enter Location”)

```
Var Password = INPUT (“Enter Password”)
If (validate (Name, User, Password, Location, DOB, Student Id))
{
        Var Student Id = T14. Student Record (Name, Username, Password, DOB, Location)
Display (“Registration Successful”)
Display (“Student Id, Name, Username, Password, Location, DOB”)
}
END
```

INPUT PARAMETERS: Student Details (Name, Username, Password, Location, DOB)

OUTPUT PARAMETERS: Student Id, Student Record

GLOBAL VARIABLES: T14

LOCAL VARIABLES: Student Id

CALLS: GET Student Details, validate data, Add to Student Records

CALLED BY: Main

5.2. Enroll staff members

5.2.1. Environmental model specification

Context Level Diagram

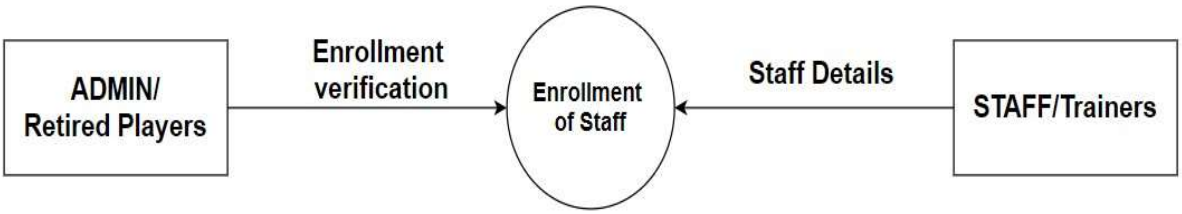

Figure 10 Level 0/Context level diagram to Enroll staff members

The above figure represents the context level diagram (DFD level 0) for the Staff Enrollment process. It shows that the enrollment of staff is conducted by admin i.e., Retired football players who wish to open the T-14 academy / Football Kit Business. The interested candidates are to provide their details and the admin verifies if they are eligible or not.

5.2.2. Internal model specification

Level 1 DFD

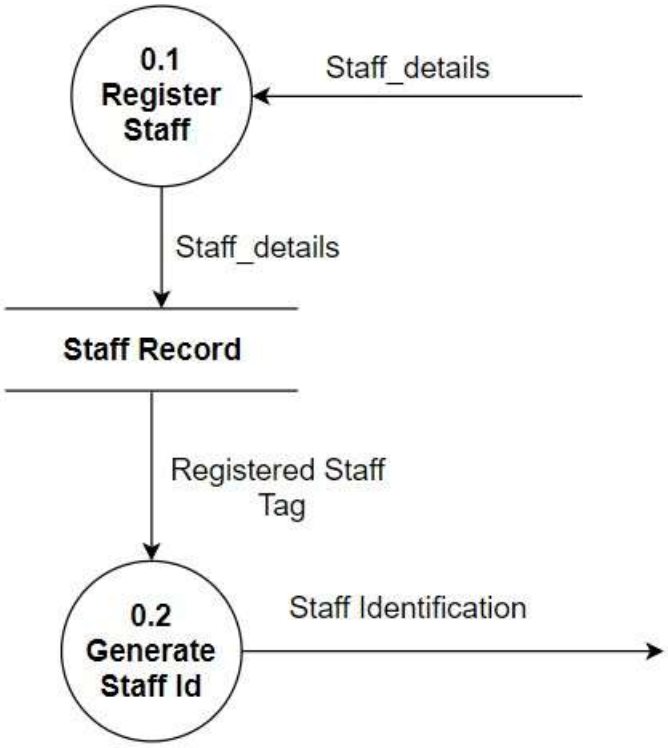

Figure 11 DFD Level 1 of registering Customers

The above DFD is a representation to further clarify the Staff Enrollment Process. The staff details are first input and the staff is registered into the database. Each staff is given Unique Id and sent for further Contract Process.

Level 2 DFD

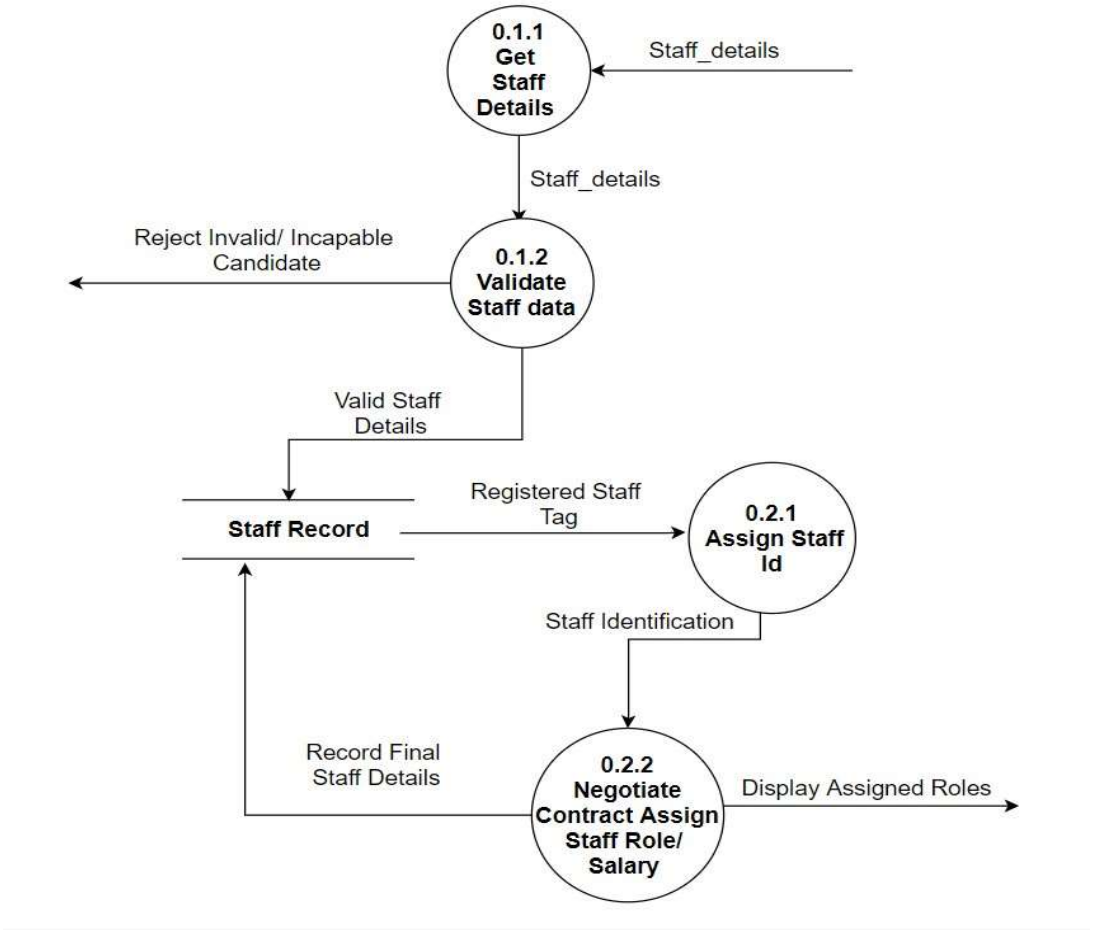

Figure 12 DFD Level 2 for Enroll Staff

This is the Final Level DFD i.e., DFD level 2 which is in a more detailed manner showing the staff enrollment process. Firstly, the Staff Details are obtained and sent for verification regarding qualification and age to be a staff or any other conditions. The incapable candidates are rejected and validated staff's data is stored in the Staff Database. The staff are then given a unique id and sent for further contract negotiations. Once a contract is finalized the staff is assigned a role/position in the business firm and salary. Finally, the final staff details are stored in the database the staff id with position is displayed for each staff.

5.2.3. Design specification

Structure Chart

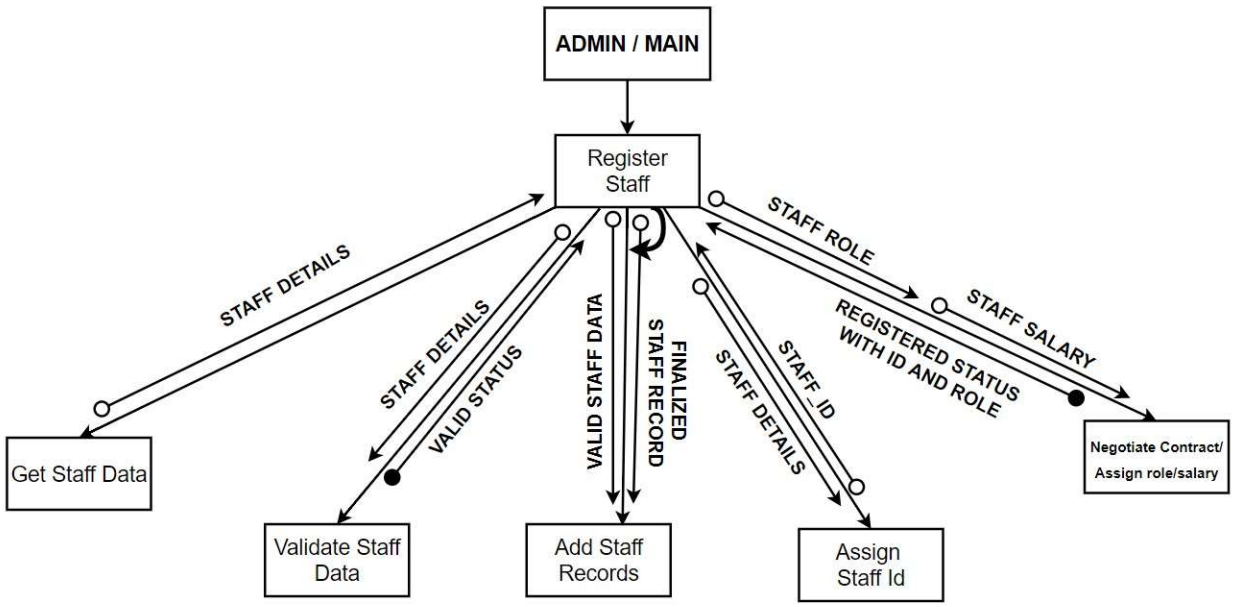

Figure 13 Structure Chart for Enrollment of staff

Module Specs

MODULE NAME: Enroll Staff members

PROPOSE: This module obtains details from candidates who desire to be staff (trainers, coaches, helpers, managers) in the T-14 Training academy and the admin validates the data and assigns staff identification tags and Positions/ roles to staff

PSEUDOCODE:

var F_name = input("Enter Full Name") var

User=input("Enter username") var

Pass=input("Enter password") var

location=input("Enter location") var

DOB=input("Enter date of birth") var

DOR=input("Enter date of registration") var

QUAL= input ("Enter Qualification") if (validate

(F_name,User,Pass, Location, DOB,

DOR, Qualification)) {

Var Staff_ID= T14.Staff_Record (full_name, username, password, DOB, location,

DOR, Qualification,) // if data from the staff record is valid, assign staff_id

Var role = xyz // Assign Staff Role for each staff Id

Var Sal = xyz // negotiate salary for each staff Id

Var Staff_ID = T14.Staff_Record (full_name, username, password, DOB,

location, DOR, Qualification, Salary, Position) // Once Staff is registered and Contract is negotiated The Staff_record database is Updated to contain latest Information.

Display ("registration successful")

Display ("Staff ID:" + Staff_ID+" for role:" + role)}

INPUT PARAMETERS: Staff_details(F_name,User,Pass,Location,DOB,DOR,QUAL)

OUTPUT PARAMETERS: Staff_ID, Salary, Position

GLOBAL VARIABLES: T14 / LOCAL VARIABLES: Staff_id **CALLS**: Get Staff details, validate data, Add to_Staff_records, Display registered status.

CALLED BY: Main

5.3. Purchase football kit

5.3.1. Environmental model specification

Context Level Diagram

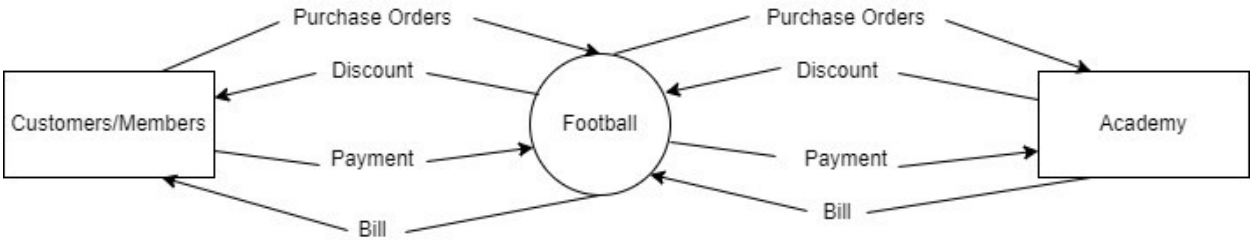

Figure 14 Context level of Purchase football

The above figure represents the context level diagram (DFD level 0) for the purchase football kit process. The customer buys the equipment, pays for it, and receives invoices, while members of the academy receive a discount for being a member of the academy.

5.3.2. Internal model specification

Level 1 DFD

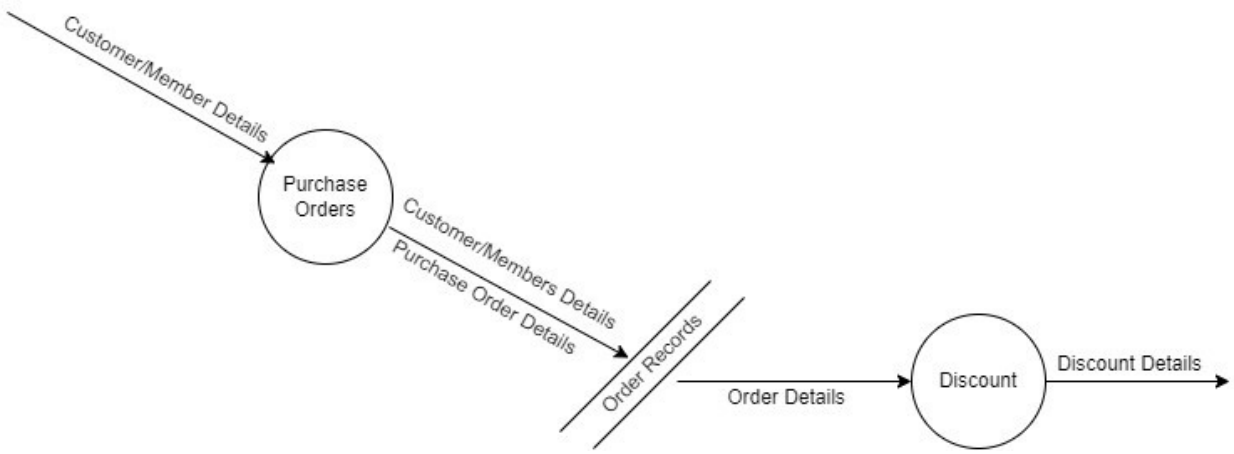

Figure 15 DFD Level 1 of Purchase football.

The graphic above is the DFD level 1 diagram for the football kit procurement process. The process is broken down into numerous smaller steps. The purchase order is stored on the order record at this point. The consumer will receive a discount if he is a member of the academy.

Level 2 DFD

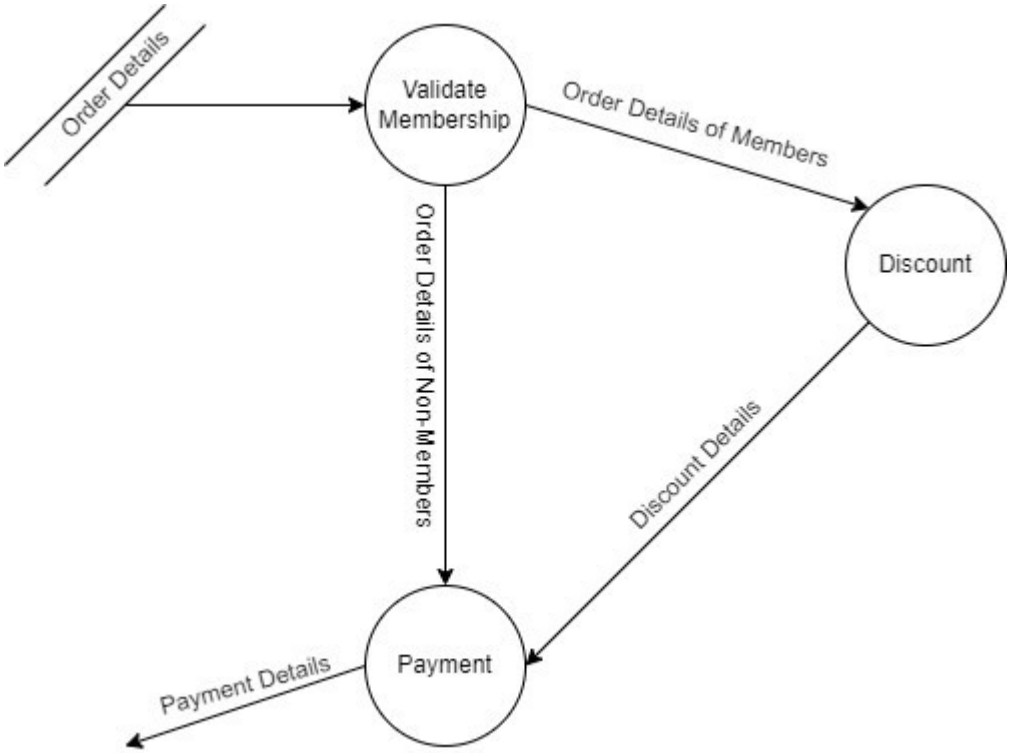

Figure 16 DFD Leve 2 of Purchase football.

The graphic above is the DFD level 2 schematic for the football kit procurement process. The membership will be validated here, and if he is a member, he will receive a discount along with the payment details.

5.3.3. Design specification

Structure Chart

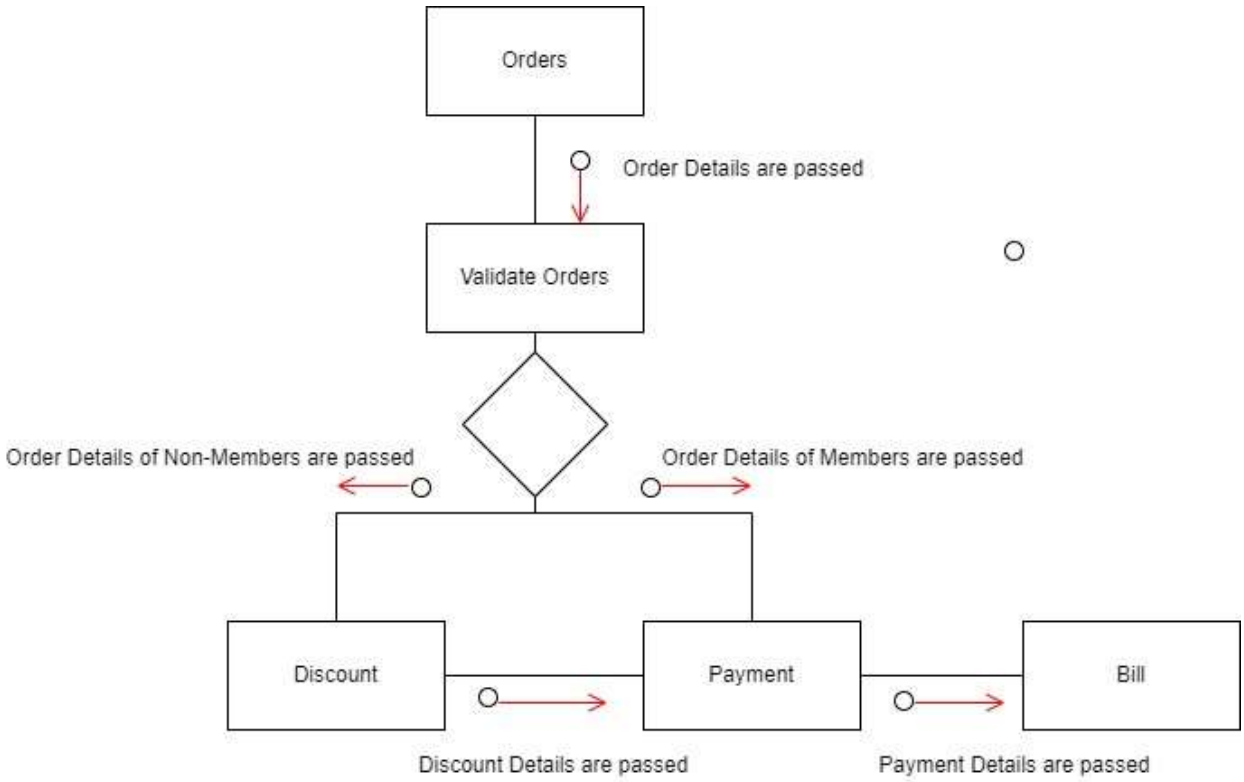

Figure 17 Structure Chart of Purchase Football.

Module Specification

MODULE NAME: Purchase Football

PURPOSE: The customer may purchase a kit from the store, and academy members can purchase the kit with a discount. The payment details, discount criteria is done in this process.

Pseudocode:

```
START

Var Name = INPUT (“Enter Full Name”)

Var name = INPUT (“Enter Full Name”)

Var DOB = INPUT (“Enter Date of Birth”)

Var User = INPUT (“Enter Username”)

Var Location = INPUT (“Enter Location”)

If (validate (Name, User, Location, DOB, Customer Id))

{

        Var Customer Id = T14. Customer Record (Name, User, DOB, Location) For

Order

DO

{
```

Receive Purchase Order

Receive Payment

Provide Discount

Give Bill
}

END DO

Display (“Customer Id, Name, User, Location, DOB”)

Display (“Payment Successful”)

Display (“Payment Details”)

}

END

INPUT PARAMETERS: Customer Details (Name, Username, Password, Location, DOB)

OUTPUT PARAMETERS: Customer Id, Customer Record

GLOBAL VARIABLES: T14

LOCAL VARIABLES: Customer ID

CALLS: GET Customer Details, validate data, Add to Ctudent Records

CALLED BY: Main

5.4. Report preparation

5.4.1. Environmental model specification

Context Level Diagram

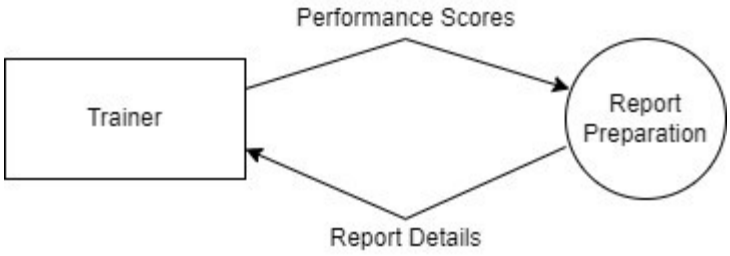

Figure 18 Context Level Diagram for Report Preparation

The diagram above depicts the context level diagram of report preparation. The trainer will review the student results and provide the report specifics.

5.4.2. Internal model specification

Level 1 DFD

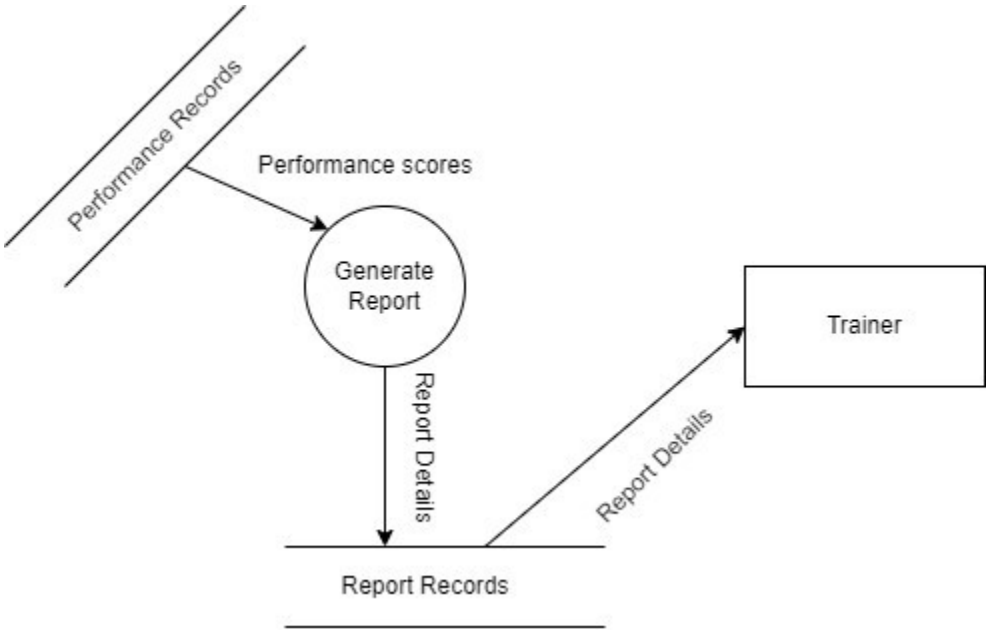

Figure 19 DFD Level 1 of Report Preparation

The above diagram depicts DFD level 1 report preparation, in which the performance data are used to construct the report, which is then saved in the report records, and the trainer is given the report information.

Level 2 DFD

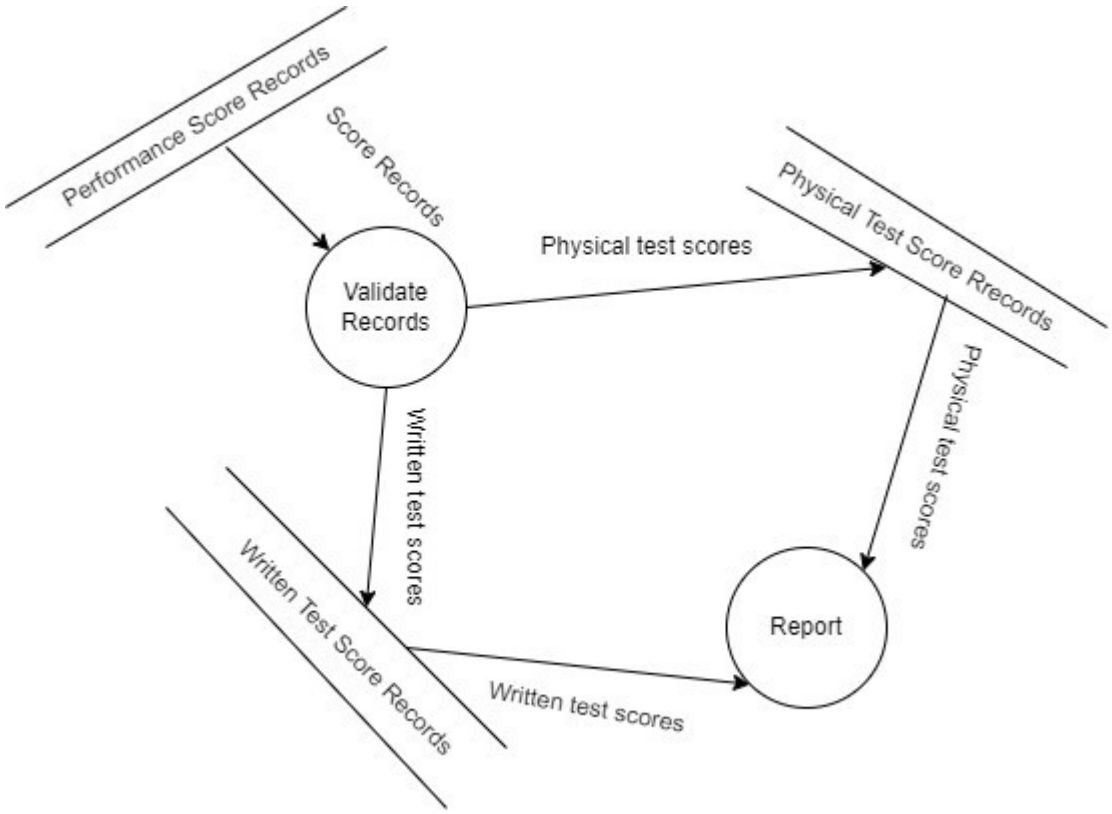

Figure 20 DFD Level 2 of Report Preparation

The image above depicts the DFD level 2 of report preparation, in which the physical test score and written test score are recorded in separate data stores and the combined report is created by the report process.

5.4.3. Design specification

Structure Chart

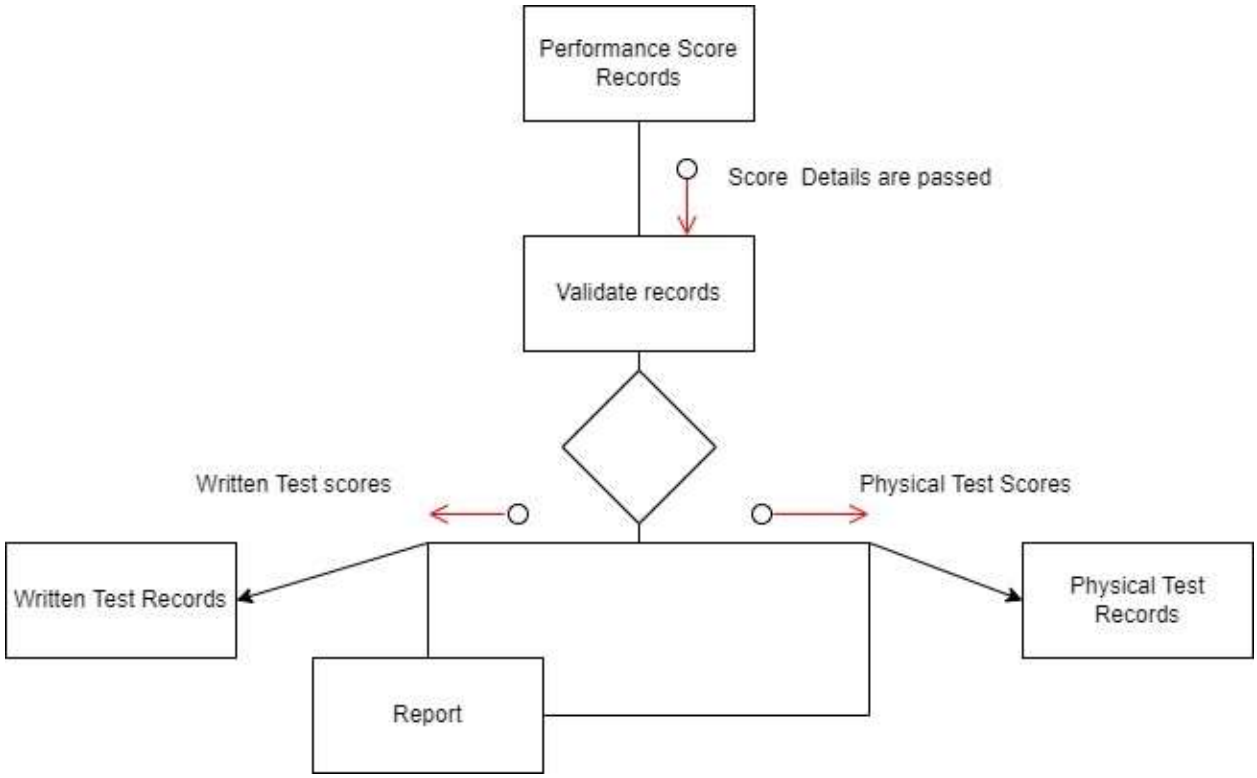

Figure 21 Structure chart of Report preparation

Module Specification

MODULE NAME: Report Preparation
PURPOSE: The student who are willing to get admitted in the academy for intermediate training have to take mock test and they will get the result of their test in this process.

Pseudocode:

START

GET Student_details FROM GENERATE Student_records

GET Exam Report FROM GENERATE Onlinephysical Exams

GET Payment_Details FROM Payment_Records

COMBINE Student_Records ON Onlinephysical Exams AND Payment_Records

GENERATE Business_Report

RETURN Business_Report

Dispay Business_Report

END

INPUT PARAMETERS: None

OUTPUT PARAMETERS: Business_Report

GLOBAL VARIABLES: None

CALLS: GET Student Details, Exam Reports, Payment_Details, validate data, Add to Student Records

CALLED BY: Main

5.5. Take a mock exam

5.5.1. Environmental model specification

Context Level Diagram

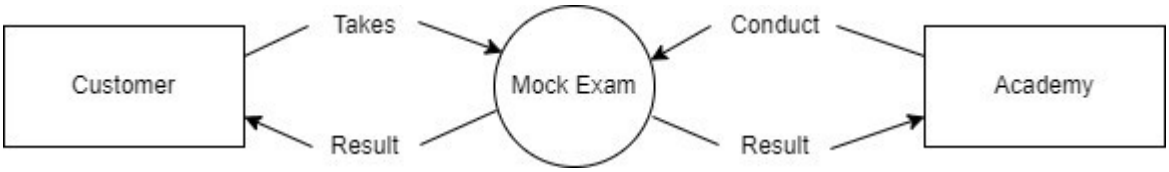

Figure 22 Context level diagram of Take a mock exam

The context level diagram of taking a mock exam is shown in the graphic above. The academy administers the mock exam and publishes the results via an internet portal, which the consumer may access and examine to see if he is eligible or not.

5.5.2. Internal model specification

Level 1 DFD

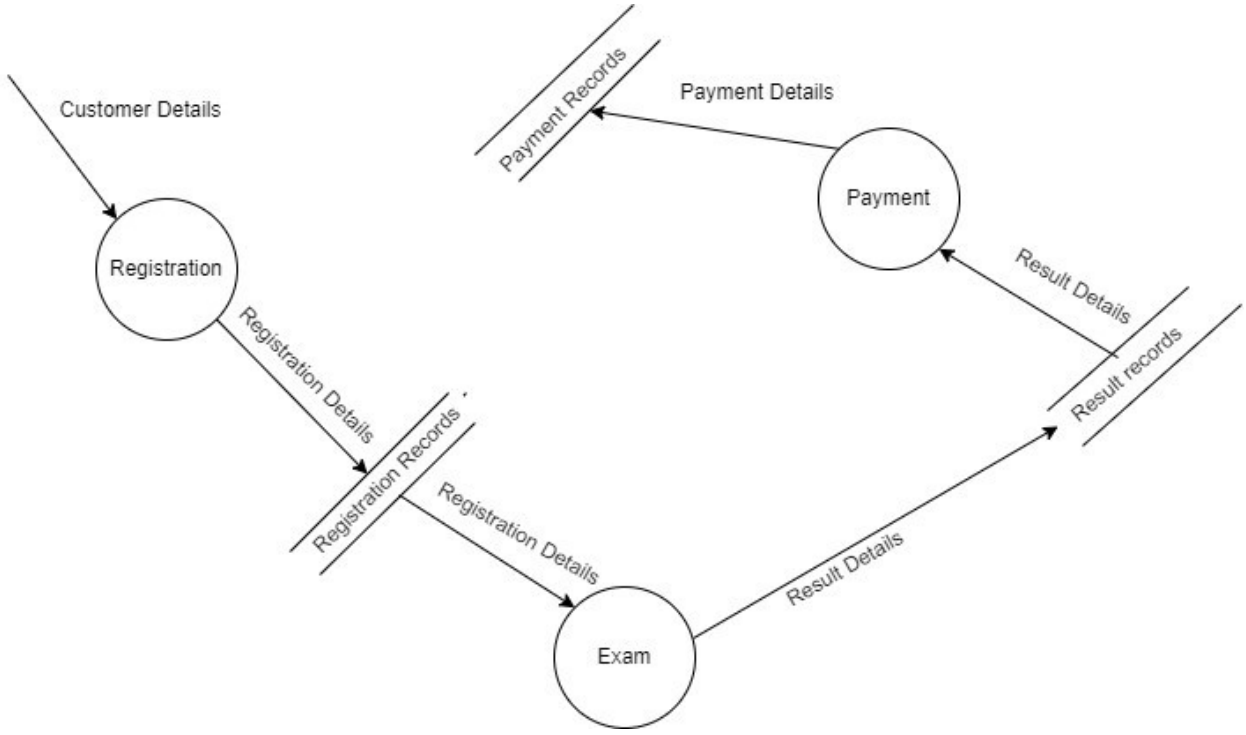

Figure 23 Level 1 DFD of Take a mock exam

The Level 1 DFD of taking a mock test is depicted in the diagram above. Here, the consumer enters his information and registers himself, which is then saved in the registration record. Then he takes the exam, which is recorded in the results file. If he is qualified, he will make the payment, which will be recorded in the payment history.

Level 2 DFD

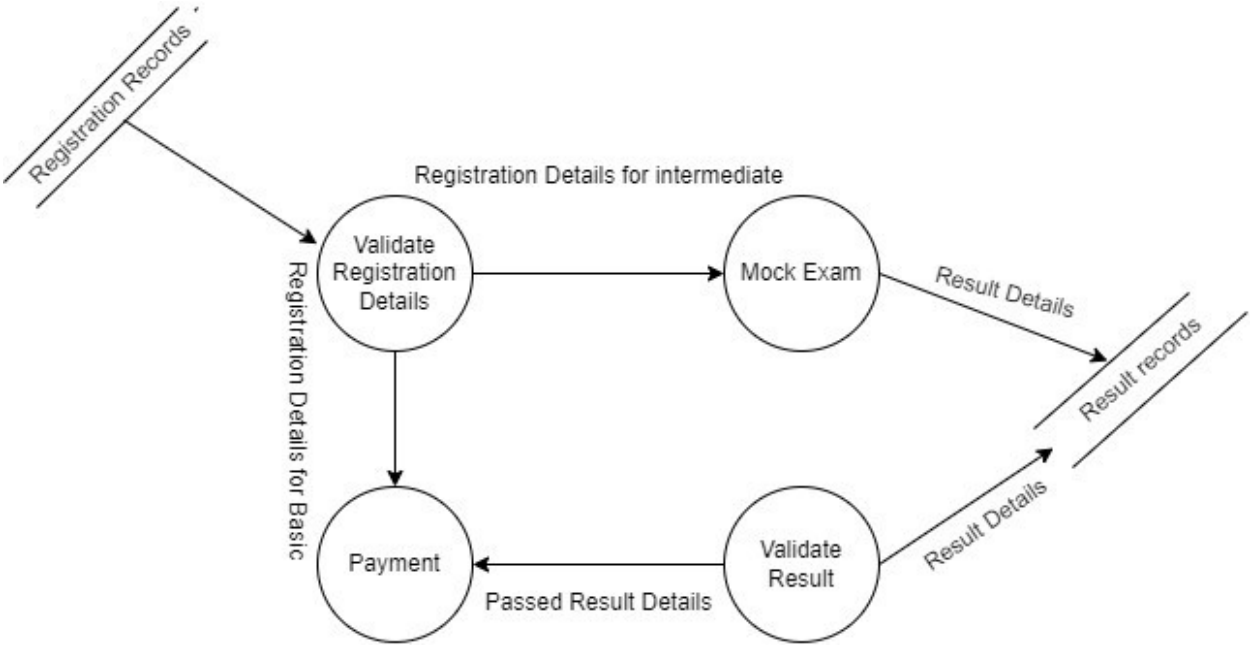

Figure 24 Level 2 DFD of Take a mock exam

Take a mock exam level 2 DFD is shown in the diagram above. Here, intermediate students can register for a mock exam, and they will only be eligible if they pass the exam. In addition, customers may simply enroll in the basic training by paying a fee.

5.5.3. Design specification

Structure Chart

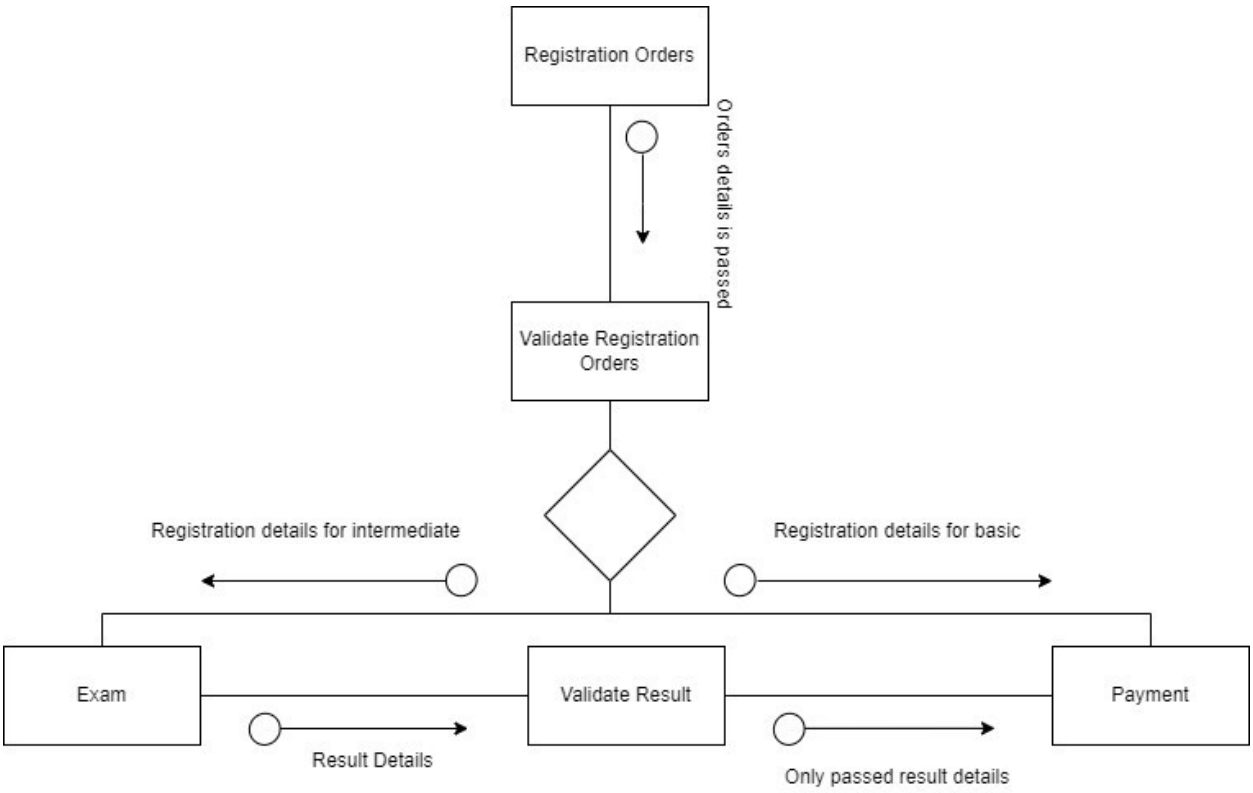

Figure 25 Structure Chart of take a mock exam

Module Specification

MODULE NAME: Take a Mock exam

PURPOSE: the student who wants to get the intermediate training get the mock exam or physical exam in this process.

Pseudocode:

```
START
GET Customer Details FROM Customers
If registration order  = beginner
{
        GIVE Exam
        Return= Result
        If result = Pass
        {
                GET Payment
                Return = Payment_Details
        }
}
If registration order = basic
{
        DO Payment
        Return = Payment_Details
}
}
```

END

INPUT PARAMETERS: Student Details (Name, Username, Password, Location, DOB)

OUTPUT PARAMETERS: Student Id, Student Record

GLOBAL VARIABLES: T14

LOCAL VARIABLES: Student Id

CALLS: GET Student Details, validate data, Add to Student Records

CALLED BY: Main

6. Summary

We completed the system analysis and design for the " T-14 Academy System Software “, which was deployed for a Football Training Academy in accordance with the scenario's requirements. The concepts of Data Flow Design, Structured Chart, Data Dictionary, Module Specification, Process Modules, and Entity Relational Diagram were used to design the needed system. This design can be implemented in a real-world scenario.

All of the members have made significant contributions to the project's completion. We've worked as a team and attended several meetings, both in person at the college and online via Google Meet. Every member of the team contributed to the Environmental Model Specification, Internal Model Specification, and data dictionary as part of the group project. In addition, each member has contributed to the general design specification of the system. This group work-based design approach is just the overall system's basic surface layer design, which has been enhanced by the specific design tasks completed by each group member. Furthermore, each member contributed to the Environment Model Specification, Internal Model Specification, and Design Specification of each function.

Several challenges arose during this coursework as we attempted to create the models as specified. However, we were able to overcome these obstacles by consulting with our team members and soliciting the assistance of our module tutor. Similarly, research on many websites, journals, and books has aided us in completing our coursework, both individually and in groups. In addition, we reviewed our lecture slides for more insight on Structured Software Engineering. Various meetings and progress discussions have also been held in order to ensure that the project is completed successfully.

As a result, we were able to effectively finish our coursework, as well as discover the importance of teamwork and the modules in our future projects.

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