

Deliverable 2 – Group #5

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SYST28951 - Systems Development Methodologies

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Client Overview

The clients in focus are a dynamic husband and wife duo who are both personal trainers that own a small gym called “UR FIT SOLUTION”. Their business, “UR FIT SOLUTION”, is centered around aerobic and weight training with a wide-ranging suite of services in a local community. Members of the gym get full access to a diverse range of equipment and personalized training sessions with the option of five different types.

Additionally, the gym offers a special discount to those who book sessions jointly with two members. Behind the operation, the owners are the main driving force behind this business and are deeply devoted to delivering exceptional experiences to their clientele. Furthermore, stakeholders such as the gym members, personal trainers, equipment suppliers, social media followers, and users that access their website all contribute to the “UR FIT SOLUTION” business, collectively shaping its success and identity.

System Vision

The existing system that is utilized by UR FIT SOLUTION are outdated, redundant, and time-consuming. This can be seen from the reliance on index cards for the owners to manage members details, and an email-based booking system that requires back-and-forth communication for reservations, unpredictable equipment waitlists, a first-come-first serve schedule for trainers, limited online presence, restricted payment methods and a lack of organized revenue analysis. The problems noted and their corresponding solutions are as follows:

1. Keeping members' personal information and contact information.

Currently, UR FIT SOLUTION is using index cards to keep track of the members' personal information but lacks members' contacts, making it hard for the business to initialize communication with the client.

The new system would require the members to create accounts that would hold the following information:

- Name
- Membership Number
- Address
- Contact Information
- Credit/Debit Card information
- Date of the Last Membership Payment for Dues

Since UR FIT is collecting personal information from its users, proper security practices should be in place to protect such data from third parties.

Once that is implemented, members can seamlessly log in to their accounts and make bookings without having the business owners manually make the appointments. The system should also enable members to book among the different training sessions according to what suits them the most. This organization would strengthen the communication between clients and workers and easing interactions in the business, overall having happier clients.

2. Training Session booking system.

For members to book a training session, the members and owners have to email back and forth to make a booking. Often times the equipment needed for the session is being used and interferes with personal training sessions, causing inconvenient delays in other sessions. It is time-consuming and reduces efficiency.

When making a booking in the new proposed system, the members can book and pay for their session conveniently through the website at their own time. The owners would then only have to approve of the bookings, with an available trainer and the equipment would automatically be reserved depending on the type of training. This slims down the error margin when making bookings and is more time efficient. This will make UR FIT SOLUTIONS more accessible to the public and ease the booking of training sessions, which could potentially attract new customers with its convenience.

3. Equipment availability

Members find it difficult to find an optimal time with long lineups and waitlists just to use specific equipment. This inorganization interferes with personal training sessions and can cause insufferable wait times.

The booking system will enable members to book equipment in advance by viewing a calendar with the dates and times when the equipment is available. The system should put proper turn times for the equipment to be wiped down after use before the next member uses the equipment. The system will automatically book the equipment requested and frequently update the calendar to ensure there is no overlapping of bookings. This automated system improves efficiency, saving time and staff from manually scheduling – leading to a more streamlined operation and reduction in errors from manual insertion or double bookings.

4. Trainer's Scheduling

At the moment, trainers volunteer to pick up training sessions when asked by the owners in a group chat which is on a first-come-first-serve basis that is not efficient, professional, or organized.

With the new system, trainers will be able to view available appointments and volunteer to work training sessions through the system. The owners would then schedule the trainers based on their availability and requests. This would introduce a fair system between the owners and personal trainers as it would allow all trainers to input their availability instead of a non-reserved system. Trainers would then be more willing to help the business succeed if they are both being paid and treated fairly with this arrangement.

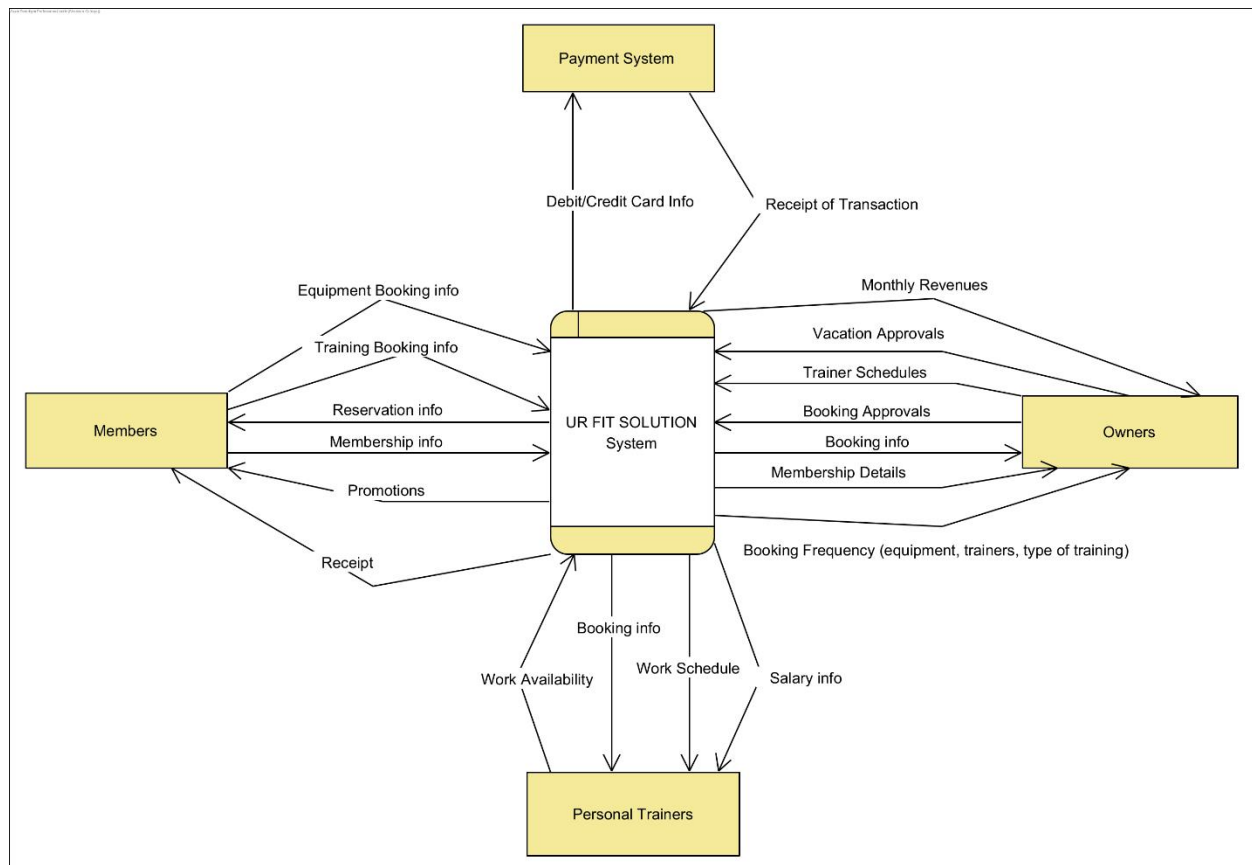
Aside from these new solutions, there are some other features that the proposed system should implement:

- Communication with members and larger online presence: Thank you emails to members after their training or workout sessions. The members could opt to leave UR FIT solutions positive reviews that will draw in more customers. Promotions should also be sent out to members via email by the system.
- Updated forms of payments: Members will have the flexibility to settle membership fees and reserve training sessions using various payment methods, including credit cards (including PayPal), debit cards, or cash. This convenience is expected to encourage members to opt for credit card transactions more willingly, particularly for larger amounts.
- Revenue analysis: generated reports that contain monthly, weekly, or daily revenues and comparisons between the previous and current reports to provide valuable insight regarding member preferences, equipment usage, and training session popularity. The UR FIT SOLUTION business can grow from these analytics and scale appropriately in the future.

Implementing a new system that integrates all the aforementioned features and solutions detailed above will not only enhance its efficiency by freeing up staff time spent on manual scheduling and service management tasks, leading to a more streamlined operation, but also mitigate the risk of errors associated with manual booking entries. This measure would help prevent long-term dissatisfaction among both customers and staff. Moreover, the system grants the benefits of accessing their business anywhere via website or phone for all users, which enables users the convenience of making reservations for their services at any given time. Additionally, including analytics enables overall business improvements

as it can influence the owners to make informed decisions tailored to trends that have proven to be profitable. Most importantly, happier customers are likely to generate more positive reviews, which can potentially attract more members and contributing to the overall flourishing of the business if managed correctly.

Context Diagram



Description

The context diagram above is graphical representation for visualizing how the UR FIT SOLUTION system, centered in the middle, interacts with its environment of other systems or entities. Communication of data between the system and entities is denoted by the arrows and its direction. Starting with the Members entity, the system will store information about the members when they create an account, book equipment or a training session, and makes it available to the Owners. The system is also connected to a payment system that charges the membership and training fee to the members credit card, debit card or PayPal account, in turn giving back a receipt of transaction to the system for the record.

Additionally, Personal Trainers can upload their work availability, receive booking details, salary information, and get approved work schedules from the system. Lastly, the Owners

Use Case Diagram of the New System



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emails or promotions, respectively. Overall, this diagram will help clarify the scope, relationships, features, responsibilities, and goals of the new system in a clear and efficient manner.

Use Case Narrative 1 – A Member Wants to Book Equipment

This use case was chosen to be explained in further detail as it is a crucial part of the business and its operations. Without the ability for Members to easily book equipment, one of its main services, the gym's business would not operate as smoothly. In detail we will explain the convenience of booking equipment through the new system from the perspective of a Member.

1. Book Equipment

ID: MEM_EQUIP

Description:

Member of UR FIT SOLUTION wants to easily book gym equipment ahead of time on their website to avoid long wait times.

Assumptions:

Member must have logged into the UR FIT SOLUTION website successfully and paid their yearly membership.

Steps :

Specified below.

Variations:

#4 Member can pick the appropriate time and specified equipment to [Book Equipment](#) through a website on their desktop, or through a website on their phone.

#5.1 & 6.2 Member can Cancel Booking through a website on their desktop, or through a website on their phone.

Non-Functional:

System must have a reliable security system and protect sensitive information when Members input their login credentials.

Performance of the system must always run smoothly on both desktop and mobile websites.

System must frequently update the equipment booking calendar to avoid booking errors or overlaps.




















Issues:

What is the mode of communication between the UR FIT SOLUTION and Email System?

Primary Actors	☹ Member
Supporting Actors	☹ Email System
Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	N/A
Post-conditions	N/A
Author	N/A
Assumptions	N/A

1.1. Scenarios

1.1.1. Scenario

1. a  Member wants to  [Book Equipment](#) at UR FIT SOLUTION
2.  Member has to  View Equipment Availability
3. **SYSTEM** displays a calendar with available times for each equipment
4.  Member can pick the appropriate time and specified equipment to  [Book Equipment](#)
5. **if**  Member needs to cancel their booking 24 hours in advanced
 - 5.1.  Member can  Cancel Booking
6. **else if**  Member needs to cancel their booking less than 24 hours in advanced
 - 6.1. **SYSTEM** will warn  Member that a penalty will be recorded on their file
 - 6.2.  Member can still  Cancel Booking if needed
 - 6.3. **SYSTEM** records penalty of  Member
7. **else if**  Member has a history of previous offenses for now showing up for 2 consecutive equipment bookings in a month
 - 7.1. **SYSTEM** will deny  Member from booking equipment for a period of two months**end if**
8.  Member has no penalties and picks an available time for equipment
9. **SYSTEM** prompts  Email System to  Send Confirmation email if equipment is booked, canceled, or denied

Use case 1: Done by Kaitlin Saqui

Use Case Narrative 2: A Member wants to Book a Training Session

This specific use case has been selected for a more comprehensive explanation due to its critical role within UR FIT SOLUTION. As booking a personal training session is one of the more complex and detailed use cases, we will be considering how a Member and an additional Bank and Email system would interact with our main system in order to complete a booking in further detail.

1. Book Training

ID: MEM_TRAIN

Description:

Member of UR FIT SOLUTION wants to easily manage and book gym training sessions on their website to avoid email communications and have the system automatically reserve the gym equipment required for the training session to avoid interference.

Assumptions:

Members must have logged into the UR FIT SOLUTION website successfully and paid their yearly membership.

Members must have the additional members details if partaking in a semiprivate training session.

Steps :

Specified below.

Variations:

#2 Member wants to Book Semiprivate Training session through a website on their desktop, or through a website on their phone.

#3 Member wants to Book Home Training session through a website on their desktop, or through a website on their phone.

#4 Member wants to cancel an existing booking through a website on their desktop, or through a website on their phone.

#5 Member will [Book Training](#) session for themselves and enter desired training through a website on their desktop, or through a website on their phone.

Non-Functional:

System must have a reliable security system and protect sensitive information when Members input their login credentials and bank information.

Bank System must be online and running in order to authenticate the user and process transactions.

Performance of the system must always run smoothly on both desktop and mobile websites.

System must frequently update the training available times to avoid booking errors or overlaps.

Issues:

What is the mode of communication between the UR FIT SOLUTION and Email and Banking System?

Primary Actors	Member
Supporting Actors	Bank System, Email System
Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	N/A
Post-conditions	N/A
Author	N/A
Assumptions	N/A

1.1. Scenarios

1.1.1. Scenario

1. a  Member wants to  [Book Training](#) session at UR FIT SOLUTION
2. if  Member wants to  Book Semiprivate Training session
 - 2.1. **SYSTEM** will prompt for the details of the additional  Member joining them and desired training
3. else if  Member wants to  Book Home Training session
 - 3.1. **SYSTEM** will prompt for details for  Member details, number of members, location, and desired training
4. else if  Member wants to cancel an existing booking
 - 4.1.  Member can  Cancel Booking
 - 4.2. **SYSTEM** will prompt cancellation details and refund
- end if
5.  Member will  [Book Training](#) session for themselves at UR FIT SOLUTION gym and enter desired training
6. **SYSTEM** will display review of their training before  Checkout
7.  Member reviews and finalizes session
8. **SYSTEM** prompts  Checkout screen and requests payment
9. if  Member wants to  Pay with Debit Card or  Pay with Credit Card
 - 9.1. **SYSTEM** will have  Bank System  Authenticate User
 - 9.2. if  Member enters invalid credentials
 - 9.2.1.  Bank System fails to  Authenticate User due to incorrect credentials
 - 9.2.2. **SYSTEM** will display an  Error Message
 - end if
 - 9.3.  Bank System recognizes valid credentials from  Member
 - 9.4. **SYSTEM** approves of online payment
10. else if  Member wants to pay with  Cash
 - 10.1. **SYSTEM** prompts  Member to go to UR FIT SOLUTION gym to finalize payment before the booked date
- end if
11. **SYSTEM** confirms transaction from  Member and gives Receipt
12. **SYSTEM** will automatically book the appropriate equipment depending on the type of training

Use case 2: Done by Kaitlin Saqui

Use Case Narrative 3: Personal Trainer Selects Training Sessions

We have chosen to elaborate on this particular use case due to the significant role played by both Personal Trainers and Owners as crucial actors in the system's operation, particularly in facilitating and managing training sessions—a vital service within the business. Personal Trainers enjoy flexibility in selecting sessions, while Owners meticulously handle the detailed scheduling of trainers.

1. Select Training Sessions

ID: TRAINER_SESS

Description:

Personal Trainers of UR FIT SOLUTION want to select available training sessions made by Members through the UR FIT SOLUTION system. Owners must select and schedule the Personal Trainers for each booking.

Assumptions:

Personal Trainers and Owners must have logged into the UR FIT SOLUTION website successfully.

Members have successfully booked a training session.

A Personal Trainer can conduct at least one type of training.

Personal Trainers have already inputted their working availability and there is at least one trainer who is available at the time of the session.

Steps :

Specified below.

Variations:

#2 SYSTEM displays a calendar with available training sessions made by Member's through a webpage on their desktop, **or** through a website on their phone

#5 Owner Schedule Trainers by viewing requests made by Personal Trainer through a webpage on their desktop, **or** through a website on their phone

Non-Functional:

System must have a reliable security system and protect sensitive information when Owners and Personal Trainers input their login credentials.

Performance of the system must always run smoothly on both desktop and mobile websites.

System must frequently update the training available times before and after the owners approval to avoid booking errors or overlaps.

Issues:








What is the mode of communication between the UR FIT SOLUTION and Email System?

How do Owners and Personal Trainers communicate professionally besides from the System regarding scheduling?

Primary Actors	🧑 Personal Trainer
Supporting Actors	🧑 Email System, 🧑 Owner
Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	N/A
Post-conditions	N/A
Author	N/A
Assumptions	N/A

1.1. Scenarios

1.1.1. Scenario

1. 🧑 Personal Trainer wants to  View Bookings available that are unassigned and what type of training sessions they are
2. **SYSTEM** displays a calendar with available training sessions booked by 🧑 Member(s)
3. 🧑 Personal Trainer  Select Training Sessions and requests to work that training session
4. **SYSTEM** confirms 🧑 Personal Trainer request and is put on pending until 🧑 Owner  Schedule Trainers
5. 🧑 Owner  Schedule Trainers by viewing requests made by 🧑 Personal Trainer
6. **if** 🧑 Owner  Approve Scheduling of the 🧑 Personal Trainer
 - 6.1. 🧑 Owner schedule the 🧑 Personal Trainer for that session
7. **else if** 🧑 Owner  Reject Scheduling of the 🧑 Personal Trainer
 - 7.1. 🧑 Owner seeks out another 🧑 Personal Trainer for that session or views other requests**end if**
8. **SYSTEM** requests that the 🧑 Email System  Send Confirmation email to 🧑 Personal Trainer if schedule request was approved/rejected

Use case 3: Done by Lyndsy Musyoki – Edited by Kaitlin Saqui

Use Case Narrative 4: Owner Manages Bookings

The following use case was selected to emphasize the importance of the Owners roles in the system. They are essential in not only operating the Trainer schedules but also ensuring that Member bookings adhere to specified criteria and accommodate their individual requirements for each training session.

1. Manage Bookings

ID: OWNER_BOOK

Description:

Owner of UR FIT SOLUTION wants to manage all training session bookings made through the system by members of UR FIT SOLUTION.

Assumptions:

Members must have paid their yearly membership to making training session bookings.

Owners must have logged into the UR FIT SOLUTION website successfully.

Members have successfully made the payments for their booking.

Personal Trainers have already inputted their working availability and there is at least one trainer who is available at the time of approving the training session booking.

Steps :

Specified below.

Variations:

#2 SYSTEM will display [Manage Bookings](#) webpage on their desktop, or through a website on their phone

#4.1 Owner Cancel Training Booking through a webpage on their desktop, or through a website on their phone

#5.1 Owner Approve Training Bookng through a webpage on their desktop, or through a website on their phone

Non-Functional:

System must have a reliable security system and protect sensitive information when Owners input their login credentials and accessing personal information.

Performance of the system must always run smoothly on both desktop and mobile websites.

System must frequently update the bookings made in sequential order for the Owners to avoid booking errors or overlaps when approving bookings.

Issues:
























What is the mode of communication between the UR FIT SOLUTION and Email System?

How will the System handle crashes, errors, or overlaps in bookings?

Primary Actors	👤 Owner
Supporting Actors	👤 Email System, 👤 Personal Trainer
Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	N/A
Post-conditions	N/A
Author	N/A
Assumptions	N/A

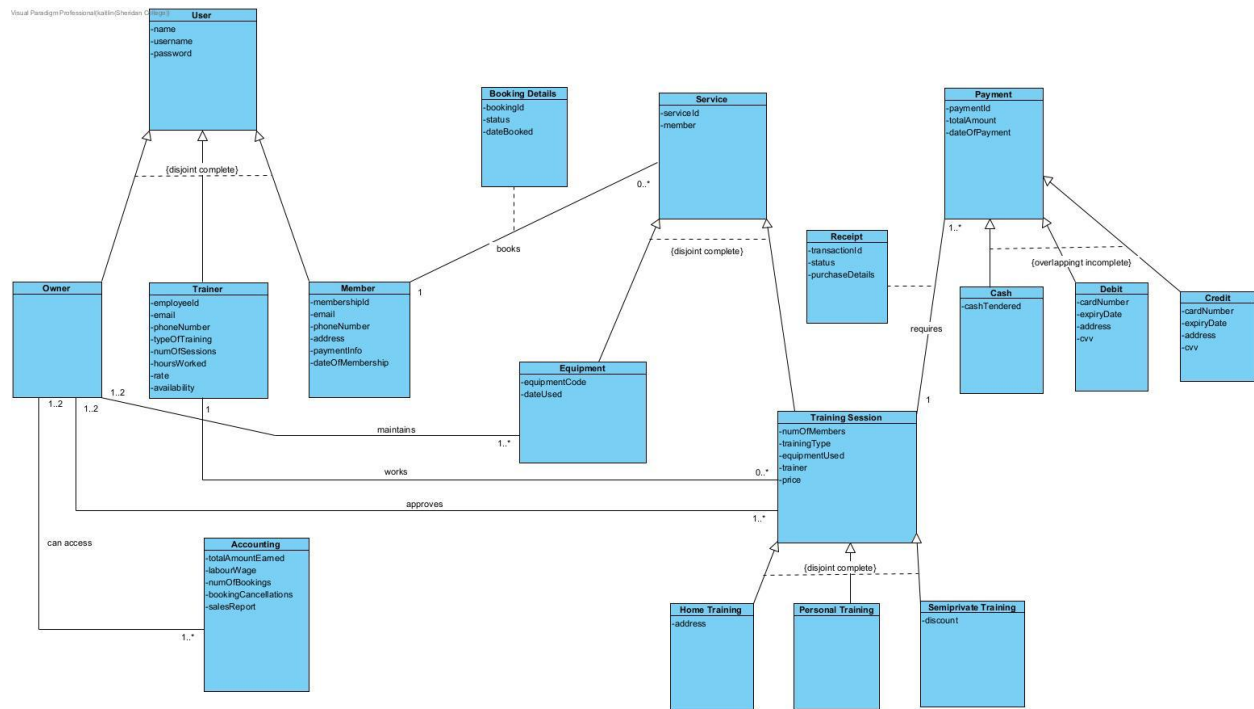
1.1. Scenarios

1.1.1. Scenario

1.  Owner wants to manage training session bookings made by  Member(s)
2. **SYSTEM** will display  Manage Bookings webpage
3.  Owner checks the history of the booked sessions  Member(s)
4. **if**  Member(s) history reveals previous offenses for not showing up for 2 consecutive equipment bookings in a month
 - 4.1.  Owner  Cancel Training Booking
 - 4.2. **SYSTEM** refunds the  Member the price of the session
 - 4.3. **SYSTEM** requests  Email System to  Send Confirmation to  Member to inform them of the change, reminding them of their current penalty and offers other options available.
5. **else if**  Member(s) history is clear of any offenses
 - 5.1.  Owner  Approve Training Booking
 - 5.2.  Owner  Schedule Trainers as per the  Personal Trainer request availability
 - 5.3. **SYSTEM** requests  Email System to  Send Confirmation to  Member and prompts them to review their experience in social media
- end if**
6. **SYSTEM** records the  Member(s) and  Personal Trainer who will be attending the scheduled training session

Use case 4: Done by Lyndsy Musyoki – Edited by Kaitlin Saqui

Domain Class Diagram



Description:

The class diagram above represents the UR FIT SOLUTION software system. It consists of classes, local variables, and relationships that are all required to implement the proposed system. The diagram consists of three super classes: Service, User and Payment with their subclasses, two associate classes, Booking Details, and Receipt, and an Accounting class.

The Service super class contains a unique id and identifies which member booked a service. The Training Session and Equipment classes are sub classes that inherit all these variables in addition to their specified variables that are not shared amongst each other. Both subclasses of Services are the only services available and can be booked as separate bookings, as they contain constraints that are both disjoint and complete. Furthermore, the Training Session subclass contains another set of sub classes, Home Training, Personal Training, and Semiprivate Training. Their constraints are disjoint and complete, meaning that a training session must be one of these subclasses and must be booked separately. The Equipment class variables keep tabs on which equipment was used and the date of use. In general, a Member is not required to book a service, but when they book 1 or more services, they receive Booking Details (association class) regarding the service they booked.

The User class is a general class that contains the Member, Owner, and Trainer sub classes. The Member class contains all the members' personal information, membership ID, payment information and membership details. The Trainer class also contains their employee information such as their employee number, rate, record of hours worked, types of training they can perform, and their working availability. Trainers may work in none or many Training Sessions, as each Training Session requires at least one Trainer. The Owners are capable of approving one to many Training Sessions and can access the Accounting class for further details on their revenue, booking frequencies, and labor wages.

The Payment super class also has Credit, Debit, Cash and PayPal as sub-classes. These are classes that represent the different modes of payment that a member can use. These subclasses contain constraints that are overlapping and incomplete, meaning that different forms of payment exist, and any number of payments can be used in combination. A payment is required by each Training Sessions, but a Training Session can have one or more payments – meaning you can split the payments into Cash and Debit during the transaction. The association between these two classes whenever a payment is made is the Receipt Class, which contains the transaction details, status, and transaction Id.

In summary, this deliverable serves as a blueprint for redesigning and evaluating the current system of UR FIT SOLUTIONS, aiming to create a new system capable of integrating all of the desired features to enhance their business operations. With a thorough analysis of the challenges faced by the business, we have created visual representations of the proposed system using multiple diagrams. These diagrams are intended to guide and offer clarity to the future development and design phases of the enhanced UR FIT SOLUTION system.