Report Topics	Suggested No. of Page(s)	Remarks
a) Cover Page	1	Refer to Appendix 1
b) Table of Content	1	-
c) Final Assessment Declaration	1	Refer to Appendix 2
d) System planning	5	Project proposal - Problem statement - Objectives and scope - Feasibility study - Gantt chart or project timeline
e) System analysis	5	- Functional & non-functional requirements - DFD and ERD. (UML if applicable) -or others if applicable
f) System design	Depends on system's complexity	-Database design - Interface design - Data dictionary - or others if applicable
g) System development	Depends on system's complexity	- Source code - Description of implementation tools and methods
h)System testing	Depends on system's complexity	- Test plan and test cases - Test results and debugging records - or others if applicable
i) User Manual	Depends on system's complexity	Screen captures system UI and descriptions
j) References	1	APA Referencing
k) Assessment Rubrics	1	Refer to Appendix 3

1.0 System Planning

1.1 Background of Study

In many organizations nowadays, many processes are still being managed manually using paper forms, spreadsheets, or with basic communication tools such as WhatsApp and email. In the fitness industry, this reliance on traditional methods often leads to issues such as missing information, delays in processing, human error, and difficulties in maintaining accurate records. As the volume of classes and client data increases, manual management becomes inefficient and unable to meet modern operational needs.

The health and fitness industry has been undergoing a significant digital transformation, rapidly shifting towards digital management tools such as app-based booking, remote training, and personalized client portals. In this competitive and evolving industry, our client, KP Fitness, a single-location, growing local fitness center, hopes to stay relevant against other competitors. Thus, they need a dedicated, modern web-based application system to manage their primary revenue sources, which are class reservation and memberships.

Therefore, we have proposed to develop the KP Fitness Class Reservation System aims to address these identified problems by providing a structured and user-friendly platform. This comprehensive, centralized, and intelligent platform integrates key functionalities such as three-tier user authentication, real-time class management, and automated reporting features, which help streamline operations and improve client loyalty. This project is expected to provide a more systematic, accurate, and convenient solution compared to the existing manual processes, which will surely help KP Fitness solve their operational challenges and grow their business.

1.2 Problem Statement

We have identified that the current existing system used by KP Fitness consists of several critical limitations and problems that the proposed system must address and solve in order to improve the overall business performance.

1. Manual Booking Conflicts: Scheduling and reservations are handled manually via spreadsheets, messaging apps like WhatsApp, and phone calls. This led to frequent double-bookings and reservation errors due to solely reliance on staff memory to mark down everything manually.

2. Inefficient Payment Processing: Membership tracking and payments are done manually or through disconnected systems. This results in delayed billing cycles, difficulty in managing non-renewal issues, and a time-consuming reconciliation process for administrative staff.

3. Poor Real-Time Visibility: Clients lack immediate, real-time views of the fitness class availability and capacity. This forces the clients to contact staff for confirmations, creating communication bottlenecks and decreasing the perceived quality of customer service.

4. Lack of Data Insight: Management team lacks centralized data, making it difficult to generate accurate and timely reports on class popularity, trainer performance, or membership retention rates. This absence of data hinders strategic business decisions.

5. Limited User Engagement: The lack of integrated digital features like automated reminders, personalized recommendations, or health tracking system led to limited user engagement and potentially low client retention.

1.3 Project Objectives

Project Objectives (SMART)

1. Reservation: To develop a fully functional, role-based reservation module that allows clients to book, view, and cancel class sessions in real-time, with the measurable goal of reducing reservation errors to zero within the system.

2. Authentication: To implement a secure three-tier user authentication system (Admin, Trainer, Client), ensuring that access privileges strictly align with roles.

3. Billing: To integrate a basic payment tracking system that registers a client's specific subscription type (monthly/yearly/one-time) and allows administrators to view billing histories and manage auto-renewal status.

4. Usability: To design a clean, responsive User Interface (UI) accessible across desktop devices, requiring minimal training for end-users to enhance operational efficiency.

5. Report Generation: To generate useful reports or summaries that can assist administrators in monitoring system performance, making important business decisions, and evaluating the system usage.

1.4 Scope of Study

The proposed system focuses on developing a web-based application designed for the KP Fitness Class Reservation System. This system will be accessible to three distinct types of registered users: Administrator, Trainer, and Client.

Role-Specific Scope and Functions:

- The Administrator will have full system control, including user management (CRUD for all users), class scheduling and content management, managing membership and payment status, generating all system reports (attendance, popularity), and maintaining system configurations.
- For Trainers, the system provides functionality such as login authentication, profile management, viewing their assigned class schedule, updating class attendance records, and viewing relevant client health metrics (Age, Height, Weight) for class preparation.
- For Clients, the system allows functionality such as account registration, secure login, profile management, viewing the real-time class schedule, making and canceling class reservations, viewing personal health metrics (BMI), and tracking personal membership status.

The system will be developed using HTML, CSS, JavaScript, and PHP as the server-side language, with MySQL as the primary database. The system will run on a web browser environment and is hosted on a local server using XAMPP.

Core Technical Inclusions:

- User Roles and Access: Full implementation of the three roles (Admin, Trainer, Client) with distinct dashboard views and Role-Based Access Control (RBAC).
- Core Functions: Real-time class scheduling, session booking, dynamic capacity updates, subscription and auto-renewal status tracing for membership, and administrative reporting.
- Advanced Features: Implementation of the Trainer Management module and AI-Assisted Scheduling (via a rule-based algorithm).

Exclusions (System Limitations):

- Complex Financial Integration: The system will only track payment status (paid, pending, overdue) and will not integrate with external banking APIs (Stripe or PayPal).
- Membership Plans: The system does not include tiered membership plans. It manages a single type of membership with varying subscription lengths (monthly, yearly, one-time).
- External Mobile App Development: The project focuses solely on the responsive web application accessible via a standard web browser.
- Deep AI/ML Modeling: The use of AI components will be simulated using simple rules and logic, rather than requiring the development and training of complex machine learning models, ensuring technical feasibility within the project timeline.
- Real-time Communication: Real-time features such as live chat or push notifications are excluded.

1.5 Feasibility Study

A Feasibility Study is conducted to determine whether the proposed system is viable and justifiable from a technical, operational, economic standpoint.

1.5.1 Technical Feasibility Study

The development of the proposed KP Fitness Class Reservation System is technically feasible based on the availability of required hardware, software, and technical skills. The system will be built as a web-based application using commonly available technologies and development tools.

1. **Hardware Requirements:**

   The project requires only basic computing hardware such as a laptop or desktop with a minimum of 8GB RAM and a modern processor to run development tools such as XAMPP and Visual Studio Code. Users only need a standard Internet-enabled device such as laptop or desktop to access the system through a web browser. No specialized hardware is required.

2. **Software Requirements:**

   The system will be developed using open-source, industry-standard technologies such as HTML, CSS, JavaScript, and PHP. MySQL will be used as the database system, while XAMPP/Apache will serve as the local development server. Additional tools such as VS Code, GitHub, and browser developer tools will be utilized to support development, debugging, and version control.

3. **Technical Skills Required:**

   The project required skills in web development, database design, UI/UX, and system testing are already covered in related coursework, and additional knowledge can be obtained through documentation and online tutorials. The chosen technologies for PHP/MySQL are also mature and well-documented. Therefore, the required technical competencies can be achieved within the development timeline.

4. **System Architecture Feasibility:**

   The system will adopt a standard Client-Server Architecture (or Three-Tier Architecture) where the PHP backend handles all logic and database interactions. This architecture is straightforward to implement and fully supported by the chosen stack.

5. **Availability of Tools & Technologies:**

   All tools required for development are free, widely available, and compatible with the developer's environment. This ensures that the system can be developed, tested, deployed, and maintained without incurring high costs or requiring specialized resources.

Based on these factors, the development of the KP Fitness Class Reservation system is considered Technically Feasible.

1.5.2 Social and Operational Feasibility Study

Social Feasibility Study

The proposed KP Fitness Class Reservation System is socially feasible because the target users (Admin, Trainer, Client) are already familiar with using digital platforms and web applications in their daily activities. The system introduces a more structured, efficient, and transparent way of managing tasks, which is expected to be well-received by users, leading to greater satisfaction and improved communication.

The system reduces manual workload, minimizes errors, and improves communication between users, trainers, and administrators. This leads to greater satisfaction and smoother operations during peak hours. As most users already possess devices like laptops and desktops with internet access, no major challenges in system adoption are expected.

Overall, the project brings positive social impact by promoting digitalization, improving user experience, and supporting a more organized workflow within the business.

Operational Feasibility Study

The implementation of the KP Fitness Class Reservation System is Operationally Feasibility as it aligns with and significantly improves the current workflow. The web-based design ensures accessibility, ease of use, and fast processing of tasks compared to the existing manual methods.

The interface is user-friendly, allowing users, trainers, and administrators to operate the system with minimal training needed. The system automates repetitive tasks such as manual booking and record tracking, enhancing efficiency and reducing errors.

Maintenance of the system is manageable as the chosen technologies used (e.g., PHP, MySQL, HTML, CSS) are widely supported and easy to update. Administrators can manage users and trainers, update content, and monitor business activities without requiring advanced technical knowledge.

Given these factors, the KP Fitness Class Reservation System is sustainable, reliable, and capable of supporting long-term operations within the business.

1.5.3 Economic Feasibility Study

Economic feasibility evaluates whether the proposed system is financially practical, cost-effective, and capable of delivering long-term economic value. This study compares the total development and operational costs against the expected financial benefits derived from improved efficiency, reduced manual workload, and enhanced productivity. To determine the system's financial viability, several financial indicators including Cost and Benefit Analysis, Return on Investment (ROI), and Payback Period are analyzed. A system is considered economically feasible when its benefits outweigh its associated costs and yields positive financial returns over its operational lifetime.

The system involves two major categories of cost:

Development Costs (One-Time Cost)

These are incurred during the creation and implementation of the system.

Hardware cost	Use of existing laptops and devices for development.
Software cost	Development tools such as VS Code, XAMPP, and MySQL (open-source).
Labour cost	Estimated time and effort required to design, develop, and test the system. (6 weeks)
Training cost	Resources used for learning technologies or methodologies.
Deployment cost	Hosting setup

Table 1

Total Development Cost: RM 30,000

Operational and Maintenance Costs (Recurring Cost)

These costs occur after the system is deployed.

Maintenance Cost	Updates, bug fixes, enhancements.
Hosting Cost	Annual web hosting or server cost.
Support Cost	User support and simple system administration.

Table 2

Yearly Maintenance Cost: RM 6,000

Summary of Cost Categories

Cost Category	Description	Cost (RM)
Development Cost	One-time cost for system creation	**30,000**
Annual Maintenance Cost	Recurring cost for updates, hosting, support	**6,000/year**
Total Cost Over 5 Years	RM 30,000 + (6,000 × 5 years)	**60,000**

Table 3

Benefit Identification:

The system provides significant financial and operational benefits, including:

1. Reduced administrative workload (Tangible Benefit).
2. Elimination of manual documentation and reduced paper costs (Tangible Benefit).
3. Faster processing time and increased data accuracy (Tangible Benefit).
4. Improved company image and customer loyalty (Intangible Benefit).

Financial Projections:

- **Estimated Monthly Benefit / Savings:** RM 12,000
- **Estimated Annual Benefit**: RM 12,000 * 12 = RM 144,000 per year
- **Total Benefit over 5 Years**: RM 144,000 * 5 = RM 720,000

Financial Techniques and Calculations

Indicator	Formula	Calculation (5-Year)	Result
Net Profit (NP)	**Total Benefit - Total Cost**	**720,000 - 60,000**	**RM 660,000**
Payback Period (PP)	**Initial Investment / Annual Net Benefit***	**30,000 / (144,000 - 6,000)**	**0.22 years (2 and a half months)**
Return on Investment (ROI)	**(Net Profit / Total Investment) * 100%**	**(660,000/60,000) * 100%**	**1100%**

Table 4

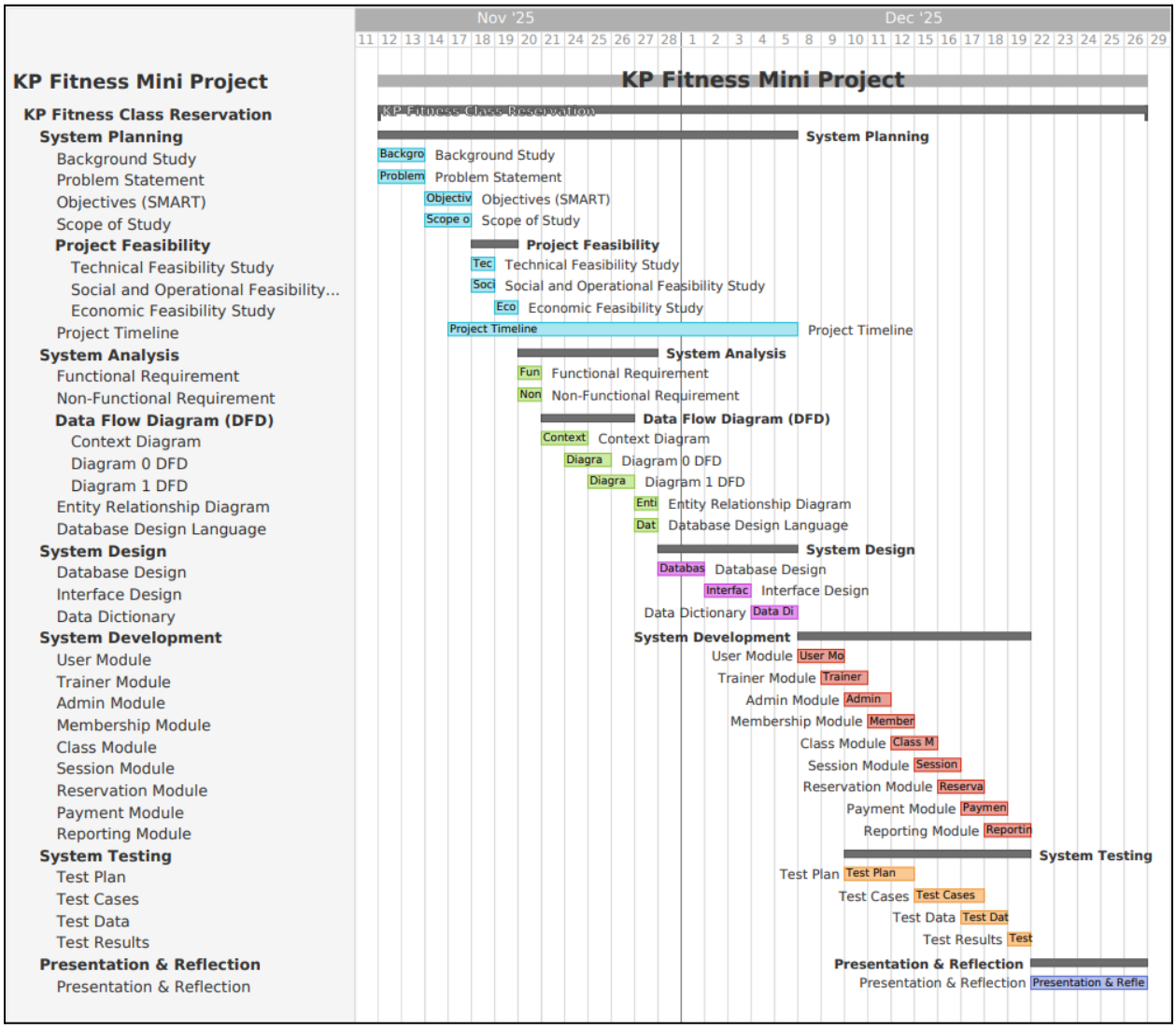
*Annual Net Benefit = Annual Benefit - Annual Maintenance Cost

= 144,000 - 6,000 = 138,000.

Conclusion:

Based on the analysis of cost, benefit, payback period, and ROI, the development of the KP Fitness Class Reservation System is highly Economically Feasible. The system achieves a payback period of only 0.22 years, demonstrating rapid cost recovery and immediate financial value. The extraordinarily high ROI of 1100% further confirms that the system is extremely cost-effective and delivers substantial long-term economic gains. The implementation of the system is therefore financially justified and highly recommended.

1.6 Project Timeline (Gantt Chart)



2.0 System Analysis

2.1 Functional Requirements

- 2.1.1 The system shall allow new users to register and log in securely, and enforce the appropriate Role-Based Access Control (RBAC).
- 2.1.2 The system shall allow Admins to create a specific class Session (defining Date, Time, Location, Max Capacity) and assign a Trainer.
- 2.1.3 The system shall allow an authenticated Client with an active membership to book an available slot for a specific Session and immediately update the Session's capacity.
- 2.1.4 The system shall allow Admins to view a Client's record and manually update their Membership Status (e.g., Active, Expired) and payment date.
- 2.1.5 The system shall allow Admins to manage a Trainer's profile information (Bio, Contact) and assign them to available class Sessions.
- 2.1.6 The system shall allow Admins to generate a report summarizing the attendance and popularity (total bookings) for all classes over a selected period.
- 2.1.7 The system shall allow clients to generate workout plans based on their Age, Height, Weight, and Goals.

2.2 Non-functional Requirements

- 2.2.1 The system shall confirm a successful class reservation or cancellation request rapidly during peak usage with confirmation message displayed and database updated within < 1.0 second.
- 2.2.2 The system shall enforce Role-Based Access Control (RBAC) to ensure unauthorized users cannot access privileged features. (Trainer and Client users must receive an "Access Denied" error message when attempting to access the Admin Report Generation page.)
- 2.2.3 The system shall provide the user interface must be fully responsive and usable on all laptop and desktop devices. (The Class Schedule page must display correctly and allow booking without horizontal scrolling on a screen width of 320 pixels.)
- 2.2.4 The system shall prevent booking failures or double-bookings when multiple users reserve the same remaining slot simultaneously. (All users simultaneously attempt to book the last remaining slot, exactly 1 successful booking and 4 "Capacity Full" errors are recorded in the database.

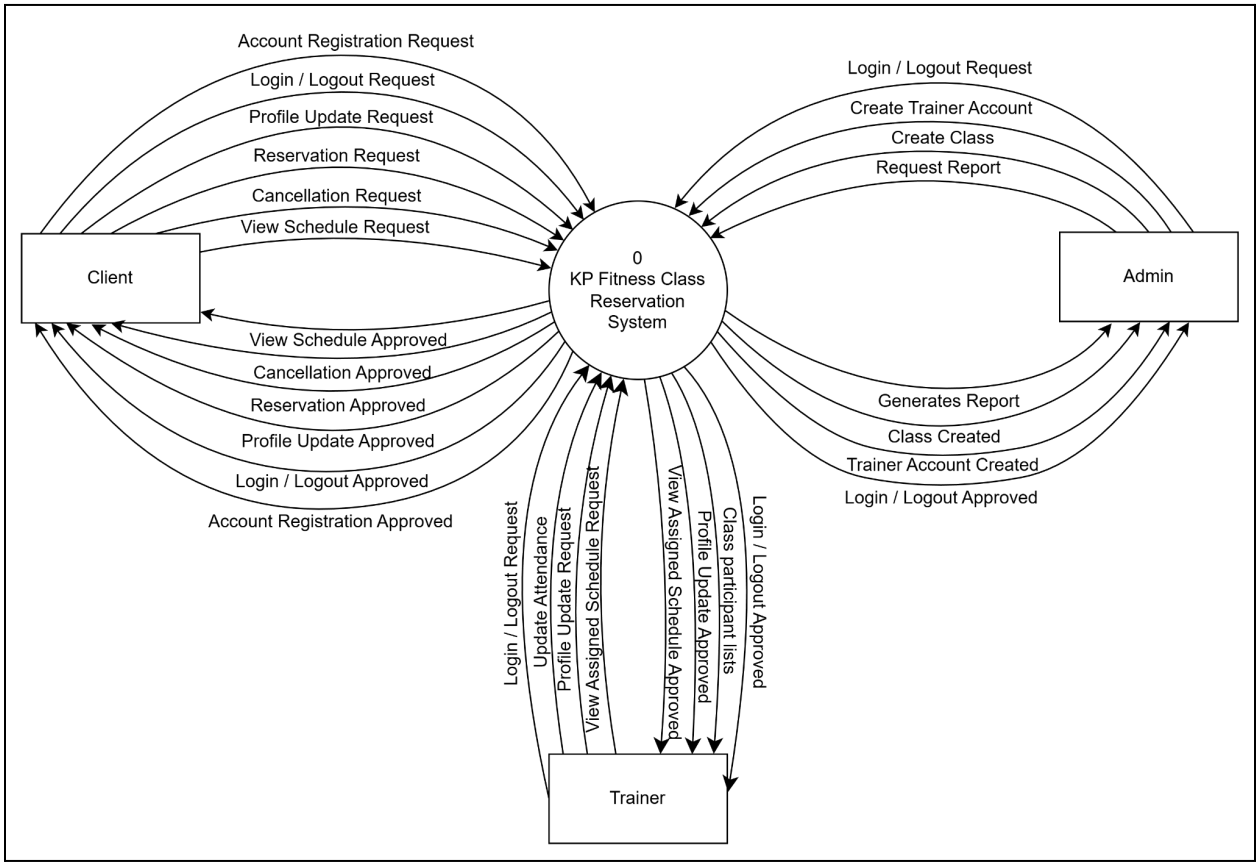
- 2.2.5 The system shall store all user passwords using a secure, one-way hashing algorithm. (All user passwords in the USER table must be stored as bcrypt (or equivalent secure PHP hash) strings; original text passwords must not be retrievable.
- 2.2.6 The core logic of the system must be fully compatible with the chosen software environment. (The system must run successfully on the specified PHP version without deprecation warnings and use the required MySQL version.
- 2.2.7 The system shall handle automated notifications reliably.

2.3 Data Flow Diagram (DFD)

The Data Flow Diagram (DFD) visually models the information flow, demonstrating how data is processed, transformed, and stored within the KP Fitness Class Reservation system using the structured systems analysis approach.

2.3.1 Context Diagram

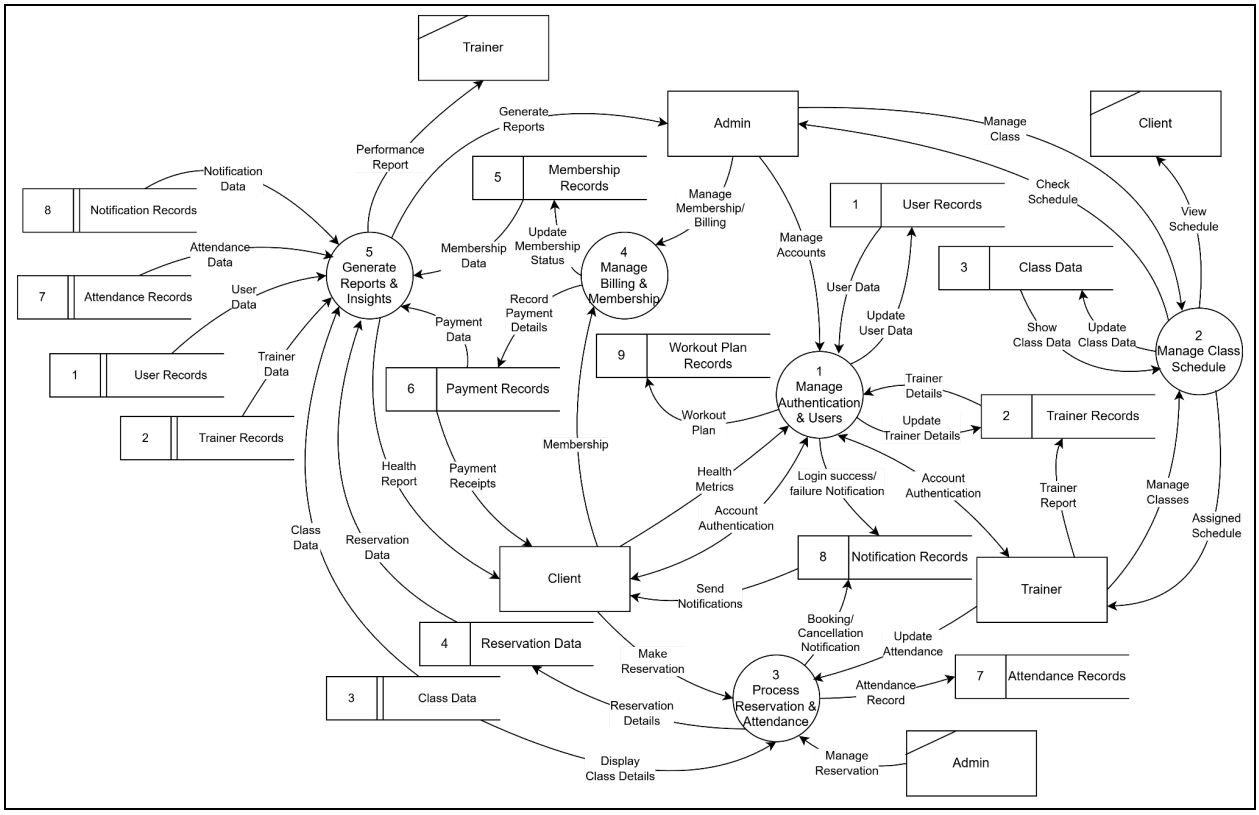
The Context Diagram defines the system's boundary, illustrating the entire KP Fitness Class Reservation system as a single process (Process 0) and showing its primary interactions with the three external entities (Admin, Trainer, Client).



Figure

2.3.2 Diagram 0 DFD

https://drive.google.com/file/d/1pRrKPeR7Zc28bjW_D7_JuB77g7qvJrld/view?usp=sharing

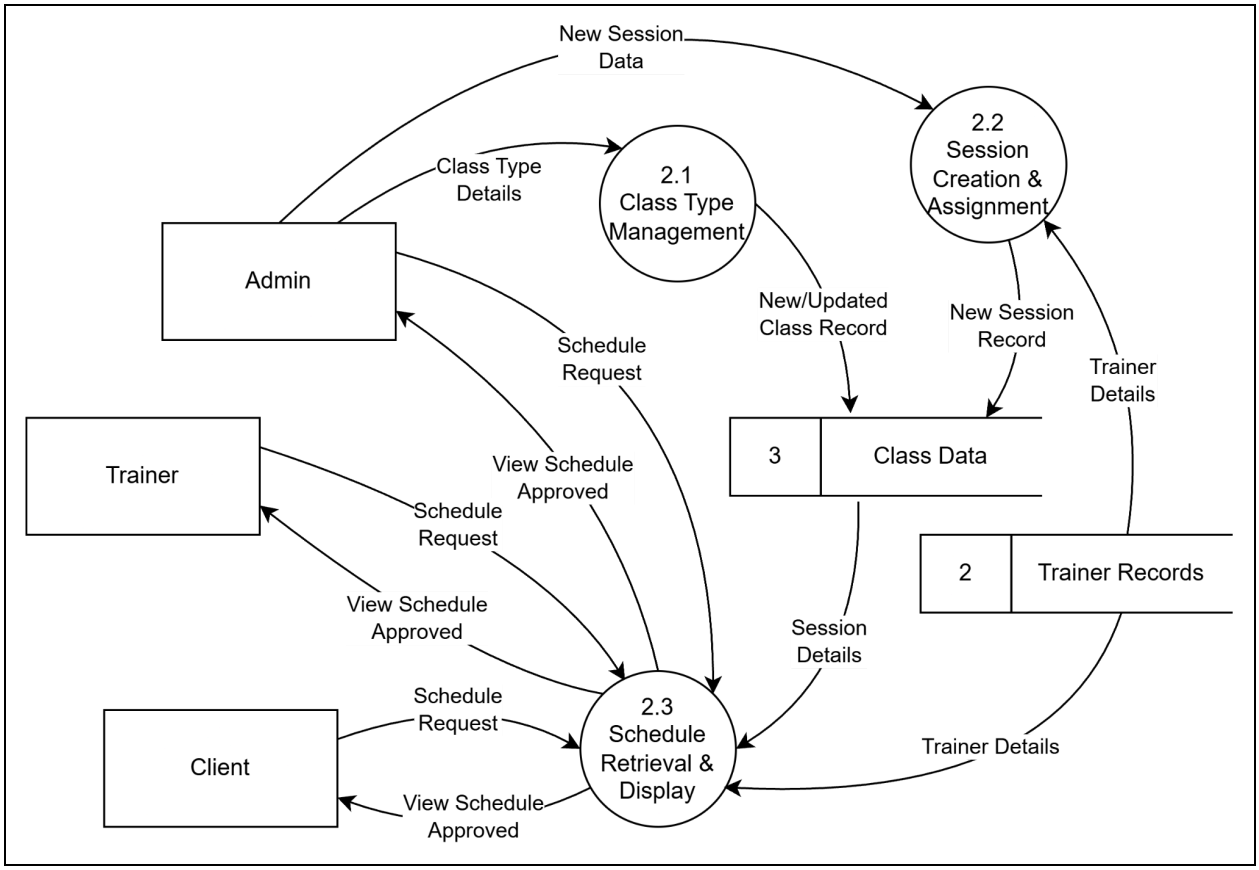


Figure

Figure shows the Level 0 DFD breaking the system down into its five primary functional sub-processes, showing the flow of data moves between these processes and the persistent data stores.

2.3.3 Diagram 1 DFD: Process Reservation and Attendance

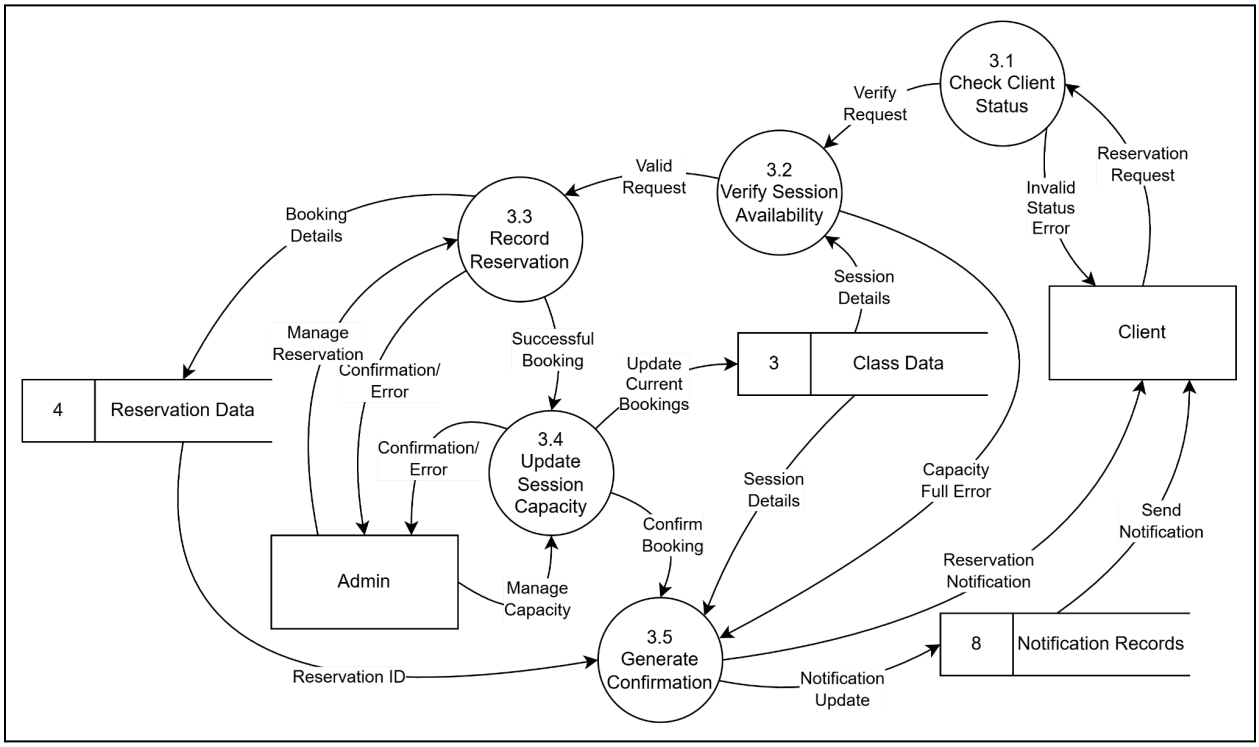
DFD 1: Process 2 - Manage Class Schedule



Figure

Figure shows the Level 1 DFD breaking down the Process 2, Manage Class Schedule, of the system into smaller sub-processes to manage class schedules and allowing Admin, Trainer, and Client to view schedules.

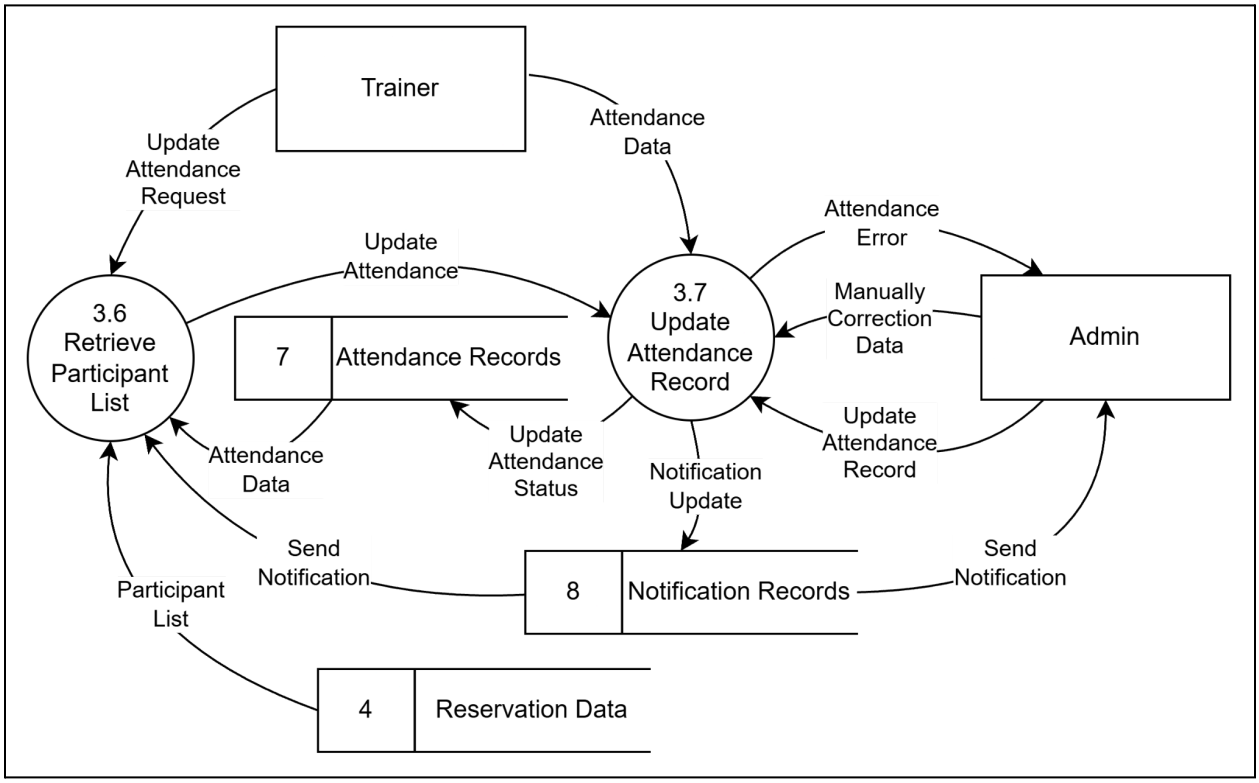
DFD 1: Process 3 - Client Reservation Flow



Figure

Figure shows the Level 1 DFD breaking down the Process 3, Process Reservation and Attendance, into first part, smaller sub-processes, Client Reservation Flow, showing Client's booking process and the Admin's override capabilities.

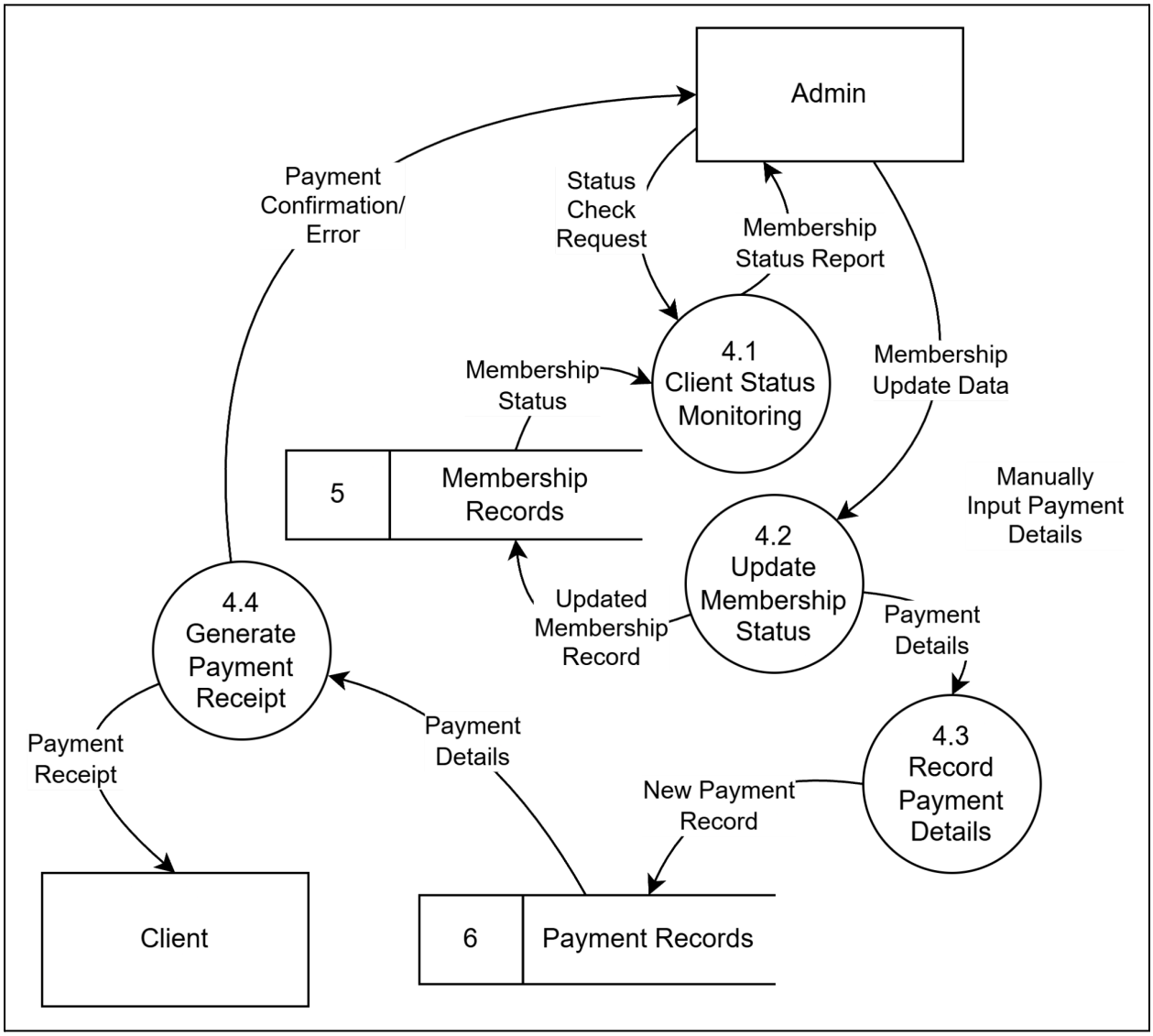
DFD 1: Process 3 - Trainer Attendance Flow



Figure

Figure shows the Level 1 DFD breaking down the Process 3, Process Reservation and Attendance, into second part, smaller sub-processes, Trainer Attendance Flow, showing the process of Trainer and Admin updating attendance.

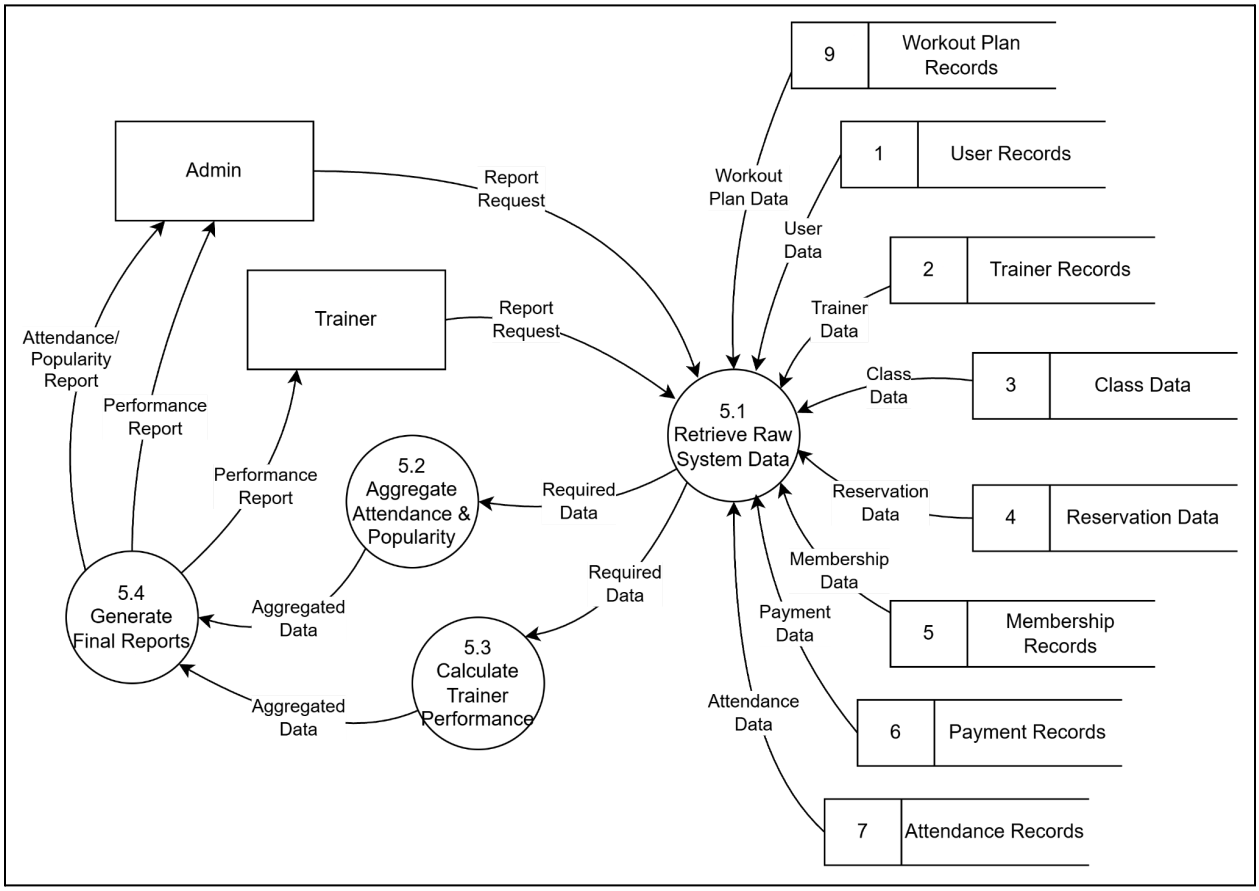
DFD 1: Process 4 - Manage Billing and Membership



Figure

Figure shows the Level 1 DFD breaking down the Process 4, Managing Billing and Membership, into smaller sub-processes to show the system's management of subscriptions and payments.

DFD 1: Process 5 - Generate Reports and Insights Analysis



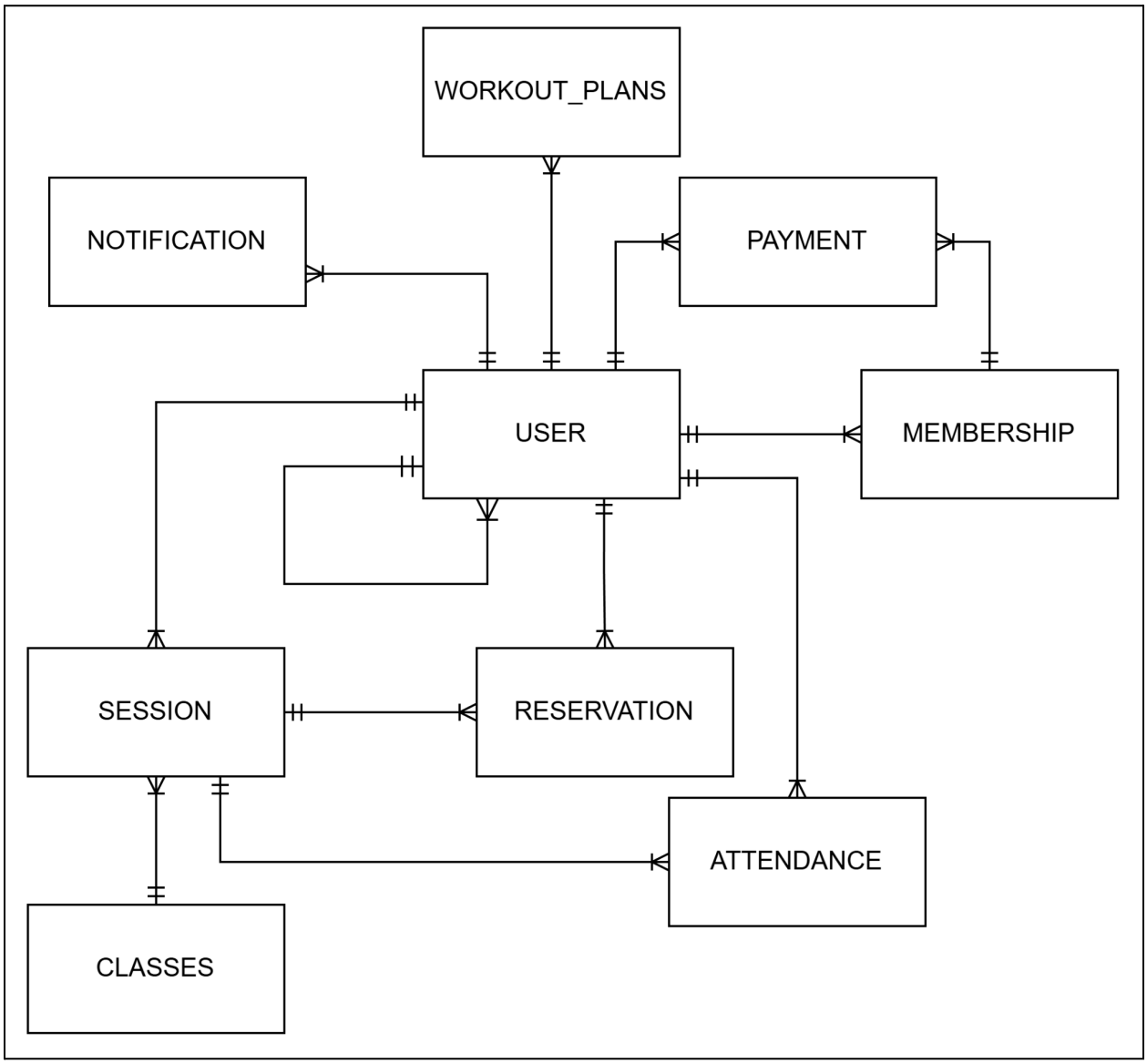
Figure

Figure shows the Level 1 DFD breaking down the Process 5, Generate Reports and Insights Analysis, into smaller sub-processes to show the required data processing pipeline for generating the insights necessary for KP Fitness to make strategic business decisions.

2.4 Entity Relationship Diagram (ERD)

The Entity-Relationship Diagram (ERD) provides the conceptual model of the MySQL database, illustrating the entities (tables) and the relationships that define the data structure.

2.4.1 Entities and Key Attributes



Figure

2.5 Database Design Language (DBDL)

The Database Design Language (DBDL) formally expresses the data structures defined in the ERD in a text format suitable for translating into MySQL schema definition scripts.

DBDL Notation Key:

User (UserID, Name, Email, Contact, Password, Role (enum: 'admin', 'trainer', 'client'), DateOfBirth, Height, Weight, CreatedAt, UpdatedAt, IsActive, TrainerID*)

Membership (MembershipID, MembershipType (enum: 'monthly', 'yearly', 'onetime'), Cost, Benefits, Duration, IsActive, UserID*)

Classes (ClassID, ClassName, Description, Duration, MaxCapacity, DifficultyLevel (enum: 'beginner', 'intermediate', 'advanced'), CreatedAt)

Session (SessionID, Date, Time, Room, Status (enum: 'scheduled', 'cancelled', 'completed'), CurrentBookings, CreatedAt, ClassID*, TrainerID*)

Reservation (ReservationID, BookingDate, Status (enum: 'booked', 'cancelled', 'attended', 'no_show'), UserID*, SessionID*)

Payment (PaymentID, PaymentDate, Amount, Status (enum: 'pending', 'completed', 'failed', 'refunded'), PaymentMethod (enum: 'credit card', 'debit card', 'touch n go', 'cash', 'bank transfer'), TransactionID, UserID*, MembershipID*)

Attendance (AttendanceID, Status (enum: 'present', 'absent', 'late'), Notes, UserID*, SessionID*)

Notification (NotificationID, Title, Message, Type (enum: 'info', 'warning', 'success', 'error'), IsRead, CreatedAt, UserID*)

Workout_plan (PlanID, PlanName, Goal (enum: 'bulking', 'cutting', 'endurance', 'strength', 'general fitness'), FitnessLevel (enum: 'beginner', 'intermediate', 'advanced'), PlanDetails, CreatedAt, IsActive, UserID*)

3.0 System Design

3.1 Database Design

Report Design

1. Reports & Analytics and there is filter for monthly or yearly revenue
2. Most popular classes
3. Membership distribution where it shows the amount of monthly membership and yearly membership

KP FITNESS
Class Popularity and Performance
Summary Report

Rank	Class Name	Total Bookings	Max Capacity	Utilization Rate
1	Yoga	180	200	90%
2	Muscle Training	320	400	80%
3	Zumba	100	130	76.92%
4	Pilates	55	100	55%

KP FITNESS

Membership Distribution and Revenue Projection Report

Membership Type	Duration	Cost (RM)	Active Clients
Monthly Subscription	1 Month	118	124
Yearly Subscription	12 Months	1183	39
One-Time Pass	1 Day	30	0

KP FITNESS

GYM REVENUE REPORT

Year (2025)	Membership	Total Subscription	Total Visit	Total Revenue (RM)
January	Monthly-Subscription	41		4838
	Yearly-Subscription	9		10,647
	total			15,485
	Non-Member (Walk-in)		25	750
	subtotal			16,235
February	Monthly-Subscription	15		1,770
	Yearly-Subscription	10		11,830
	total			13,600
	Non-Member (Walk-in)		20	600
	subtotal			14,200
March	Monthly-Subscription	26		3,068
	Yearly-Subscription	4		4,732
	total			7,800
	Non-Member (Walk-in)		30	900
	subtotal			8,700

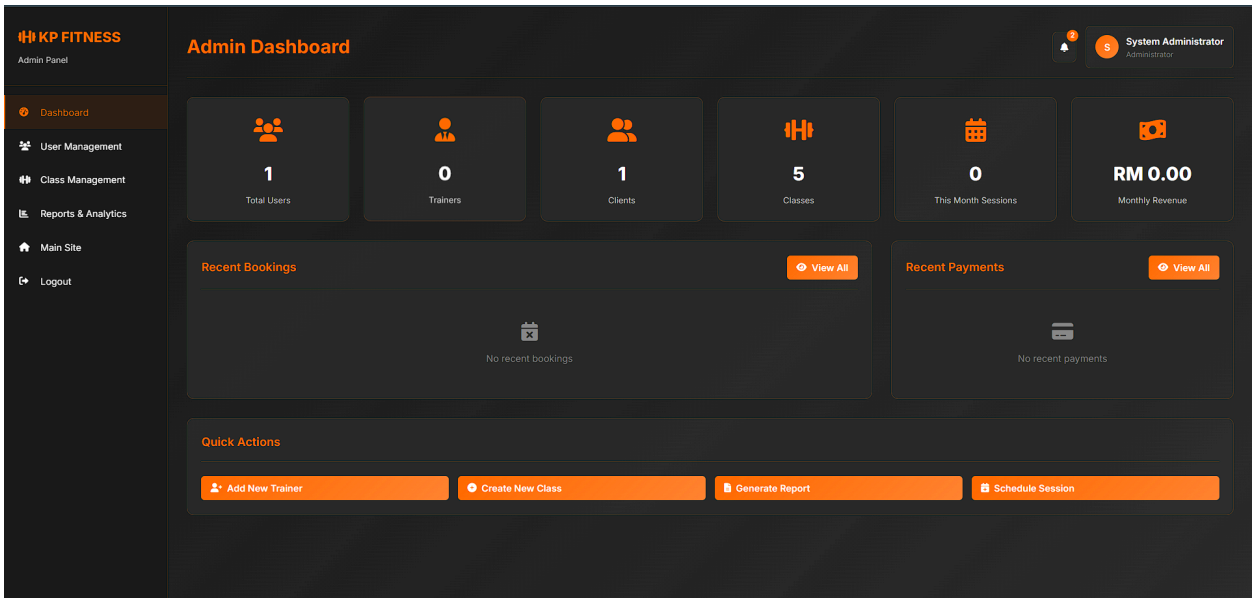
April	Monthly-Subscription	12		1,416
	Yearly-Subscription	3		3,549
	total			4,965
	Non-Member (Walk-in)		25	750
	subtotal			5,715
May	Monthly-Subscription	9		1,062
	Yearly-Subscription	1		1,183
	total			2,245
	Non-Member (Walk-in)		10	300
	subtotal			2,545
June	Monthly-Subscription	16		1,888
	Yearly-Subscription	4		4,732
	total			6,620
	Non-Member (Walk-in)		8	240
	subtotal			6,860
July	Monthly-Subscription	14		1,652
	Yearly-Subscription	1		1,183
	total			2,835
	Non-Member (Walk-in)		8	240
	subtotal			3,075

August	Monthly-Subscription	12		1,416
	Yearly-Subscription	3		3,549
	total			49,65
	Non-Member (Walk-in)		14	420
	subtotal			5,385
September	Monthly-Subscription	23		2,714
	Yearly-Subscription	7		8,281
	total			9,697
	Non-Member (Walk-in)		20	600
	subtotal			10,297
October	Monthly-Subscription	16		1,888
	Yearly-Subscription	9		10,647
	total			12,535
	Non-Member (Walk-in)		15	450
	subtotal			12,985
November	Monthly-Subscription	15		1,770
	Yearly-Subscription	4		4,732
	total			6,502
	Non-Member (Walk-in)		15	450
	subtotal			6,952

December	Monthly-Subscription	10		1,180
	Yearly-Subscription	5		5,915
	total			7,095
	Non-Member (Walk-in)		10	300
	subtotal			7,395
	GRAND TOTAL			100,344

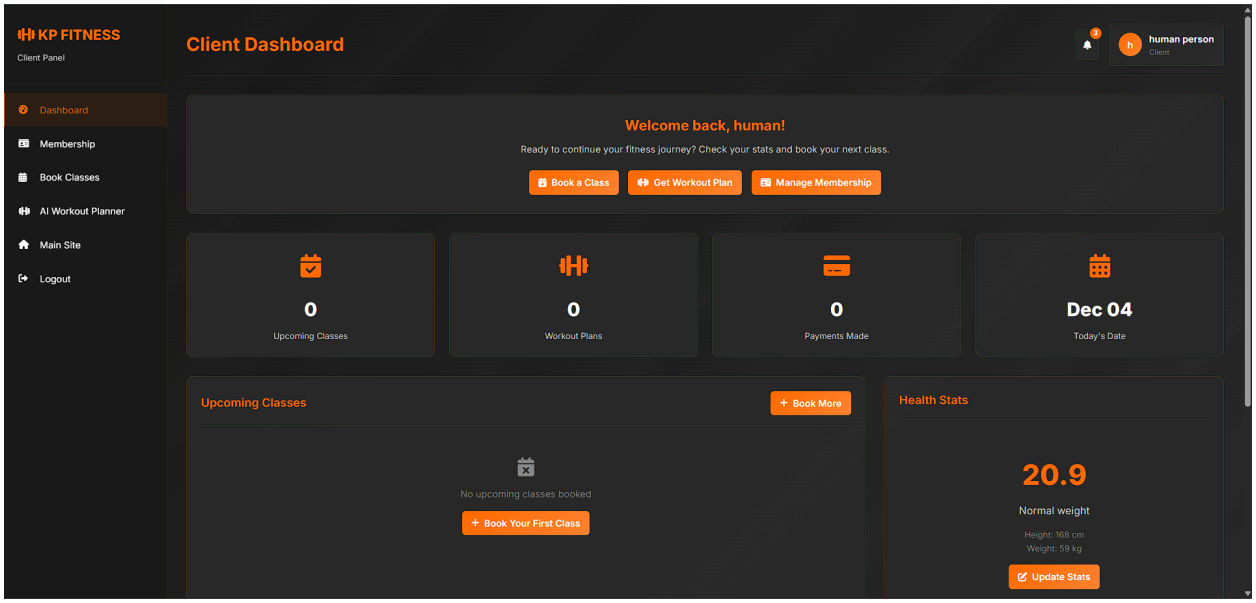
3.2 Interface Design

3.2.1 Admin Interface



3.2.2 Trainer

3.2.3 User



3.2.4 Main Menu

3.3 Data Dictionary

4.0 System Implementation

4.1 Source code

4.2 Description of Implementation Tools and Methods

5.0 System Testing

5.1 System Testing

5.1.1 Test Plan

5.1.2 Test Cases

5.1.3 Test Data

5.2 Test Results