AccessFit: Enhancing Gym Management with QR Code-Based Access Control
Requirements Specifications Document

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Revision 2.0

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Revision History

Revision	Date	Explanation
0.1	04.11.2024	Initial Draft
0.2	06.11.2024	Supervisor Feedback
0.3	10.11.2024	Revised Draft
0.4	14.11.2024	Supervisor Feedback
1.0	17.11.2024	Final Draft
1.1	23.12.2024	Version 2.0 initial draft
1.2	03.01.2025	Supervisor Feedback
2.0	12.06.2025	Final Report

Contents

1. Introduction

This Requirements Specification Document (RSD) outlines the design and functionality of AccessFit, a mobile application developed to transform the gym experience for fitness enthusiasts. The application combines advanced technology with user-centric design to create a seamless, motivating, and personalized fitness journey. AccessFit integrates a secure and efficient barcode-based entry system alongside tools that help users track their workouts, set and achieve fitness goals, and stay motivated throughout their fitness journey. The primary goal of AccessFit is to offer gym-goers a more streamlined and engaging experience that enhances motivation, supports goal setting, and tracks progress effectively.

The fitness industry faces challenges when it comes to motivating users, providing personalized workout plans, and tracking performance over time. Many existing gym apps focus only on basic functions like membership management and scheduling, without offering the comprehensive, personalized features that modern gym-goers demand. AccessFit aims to fill this gap by not only facilitating quick and secure gym access through barcode scanning but also by offering customized workout routines, progress monitoring, and motivational support, all designed to keep users engaged and progressing.

With AccessFit, users can expect more than just an entry system; they will have access to a comprehensive fitness solution that adapts to their individual goals, helps them stay consistent, and offers the tools they need to see tangible results.

2. Overview of AccessFit Related Resources and Product

AccessFit stands out in a market already populated by similar fitness applications and gym management platforms. While other platforms, such as Maksisoft Gym and MacFit, provide basic features like scheduling and membership management, AccessFit differentiates itself by its focus on personalized workout plans and a unique barcode-based entry system, creating a more streamlined and integrated experience for gym-goers.

Maksisoft Gym and MacFit offer valuable functionalities, but they lack the depth in terms of personalized fitness features and motivational tools, which are central to AccessFit's approach. AccessFit places an emphasis on user engagement with achievement badges, progress reports, and reminders, which are designed to keep users motivated and focused on their fitness goals, beyond just logging attendance or booking classes.

In contrast to these broader fitness management tools, AccessFit's design focuses on providing users with a more personalized and engaging experience, ensuring they remain consistent and connected with their fitness routines.

2.1. Maksisoft Gym:

Maksisoft Gym is a comprehensive gym management software offering features for membership management, turnstile access, mobile app integration, online scheduling, reporting, and analytics. The membership management module simplifies registration, payments, and renewals, with notifications for expiring memberships. The turnstile access system controls entries through card or biometric authentication and records each entry. Reporting and analytics tools allow tracking of member check-ins, payments, and class data. The software also supports managing group classes and personalized training programs, as well as centralized management of multiple gym locations. Additionally, it includes a staff management module to track trainer schedules and workload.

2.2. MacFit:

MacFit offers a comprehensive mobile app experience for gym members, encompassing membership management, online booking, training programs, and nutrition support. Members can register, renew, and make payments directly through the app, which also enables QR code-based entry for streamlined check-ins and tracked access. The app's online booking system allows users to schedule classes, personal training sessions, and track their workout programs. For those seeking personalized guidance, custom and pre-designed workout plans are available with progress tracking, alongside tailored diet plans and fitness monitoring. Members can easily locate nearby gym locations, view operating hours, and check peak times. The app also provides notifications for workout reminders and membership renewals, along with in-app payment features, billing history, and invoices. Additionally, users have access to campaigns, discounts, and rewards, while performance tracking tools enable monitoring of fitness goals and progress through detailed data analysis.

3. Functional Requirements of AccessFit

3.1 Requirements List

Use Case No.	Use Case Name	Short Description
1	**Sign Up**	**Users register and create an account.**
2	**Create Username and Password**	**Users set up their credentials for the account.**
3	**Update Database**	**The system stores or updates user information.**
4	**Sign In**	**Users log in to the system by entering credentials.**
5	**View Profile**	**Users view their profile details.**
6	**Edit Profile**	**Users modify their profile information.**
7	**Scan Barcode**	**Users scan their barcode for system access.**
8	**Create Barcode**	**The system generates a unique barcode for the user.**
9	**Validate Access**	**The system validates the scanned barcode.**
10	**Grant Access**	**The system allows entry if validation is successful.**
11	**Training**	**Users create a workout plan and engage in training sessions.**
12	**Add Muscle Group**	**Users add muscle groups (e.g., arm, leg) to the workout plan.**
13	**Save Workout Plan**	**The system saves the completed workout plan.**
14	**Receive Workout Reminder**	**Users receive notifications about upcoming workouts.**
15	**Earn Achievement Badge**	**Users earn badges for achieving fitness goals.**
16	**View Motivation Feed**	**Users view a feed with motivational content.**
17	**Log Workout Data**	**Users log details of their workouts into the system.**
18	**View Progress Summary**	**Users view summarized reports of their fitness progress.**
19	**Access Detailed Analytics**	**Users view in-depth analytics about their fitness activities.**
20	**Store Workout Data**	**The system saves logged workout data for later use.**

3.2 Actors and Use Case Diagrams

User: User A gym member who uses the system to register, scan barcodes for entry, create workout plans, and track progress. System Admin Manages the backend of the application, including user data, barcode generation, and system maintenance.

System: The software that handles all operations like authentication, barcode validation, and progress analytics.
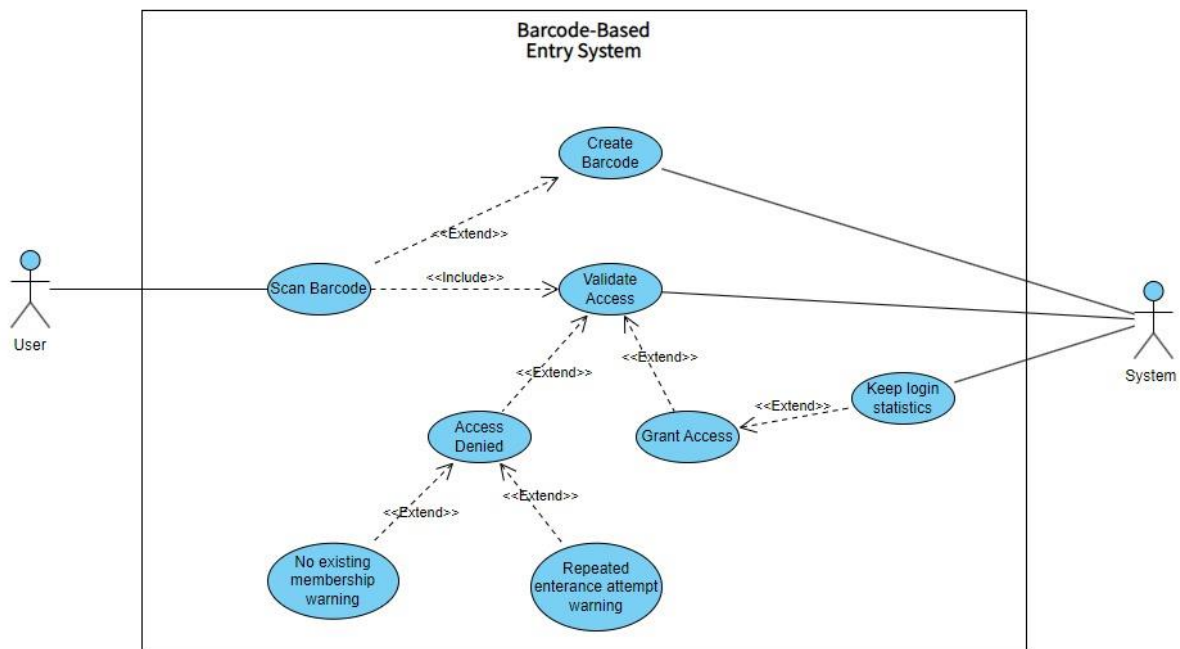
3.3 ACCESSFIT Use Case Diagram Groups

| Subsystem/Package	Use Cases
User Registration and Profile Management	- Sign Up - Create Username and Password - Update Database - Sign In - View Profile - Edit Profile - Update Profile
Barcode-Based Entry System	- Scan Barcode - Create Barcode - Validate Access - Grant Access - Access Denied - No Existing Membership Warning - Repeated Entrance Attempt Warning - Keep Login Statistics
Workout Plan Customization	- Training - Create Empty Workout Plan - Add Muscle Group (Arm, Biceps, Triceps, Leg, Shoulder, Chest) - Complete Workout Plan - Save Workout Plan
Motivational Features	- Receive Workout Reminder - Earn Achievement Badge - View Motivation Feed - Send Workout Reminder - Track User Activity - Award Achievement Badge - Update Motivation Feed
Progress Tracking and Analytics	- Log Workout Data - View Progress Summary - Access Detailed Analytics - Store Workout Data - Generate Progress Summary - Perform Analytics

3.4 ACCESSFIT Use Case Diagrams

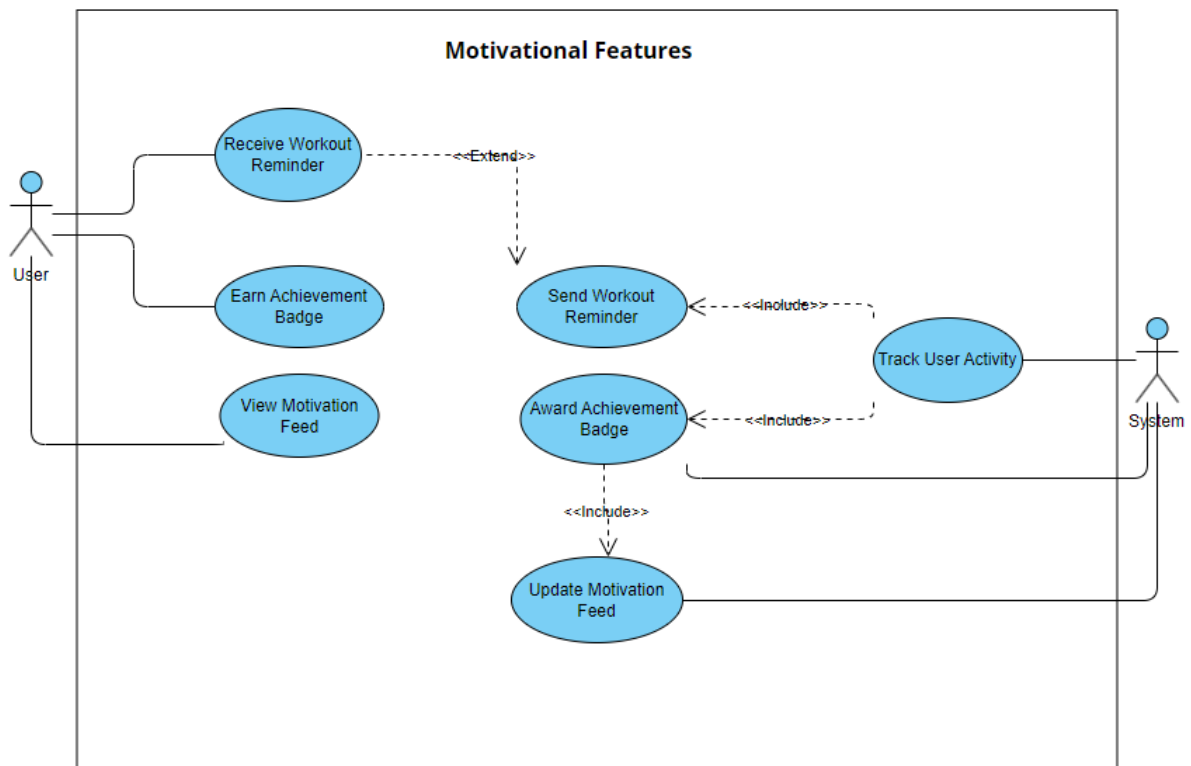### 3.4.1 Use Case 1: User Registration and Profile Management
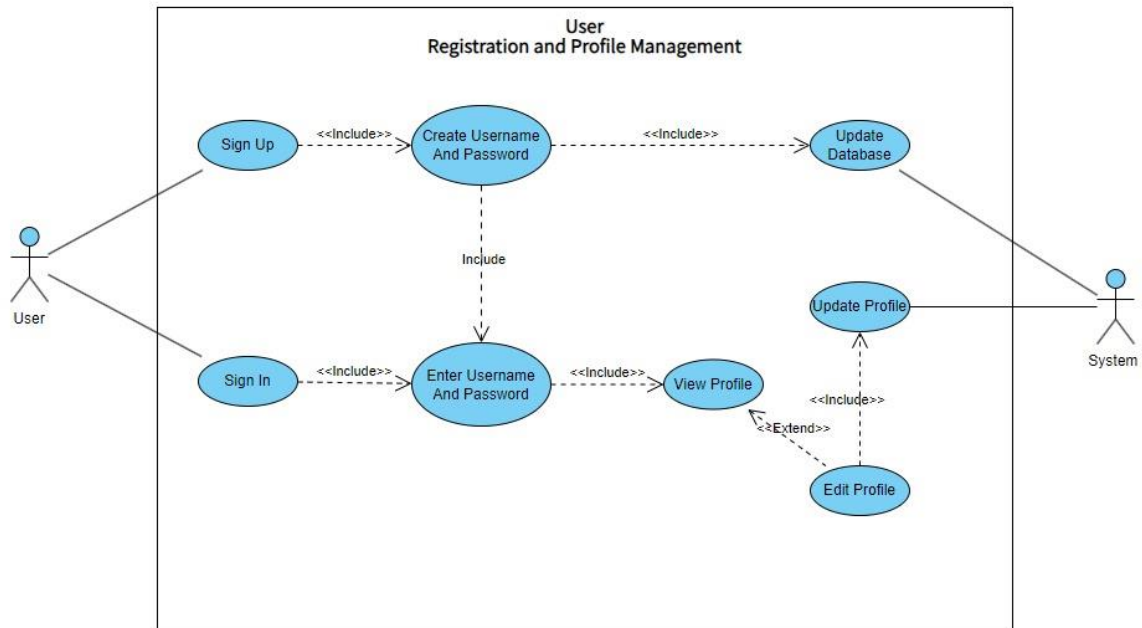
3.4.2 Use Case 2: Barcode-Based Entry System

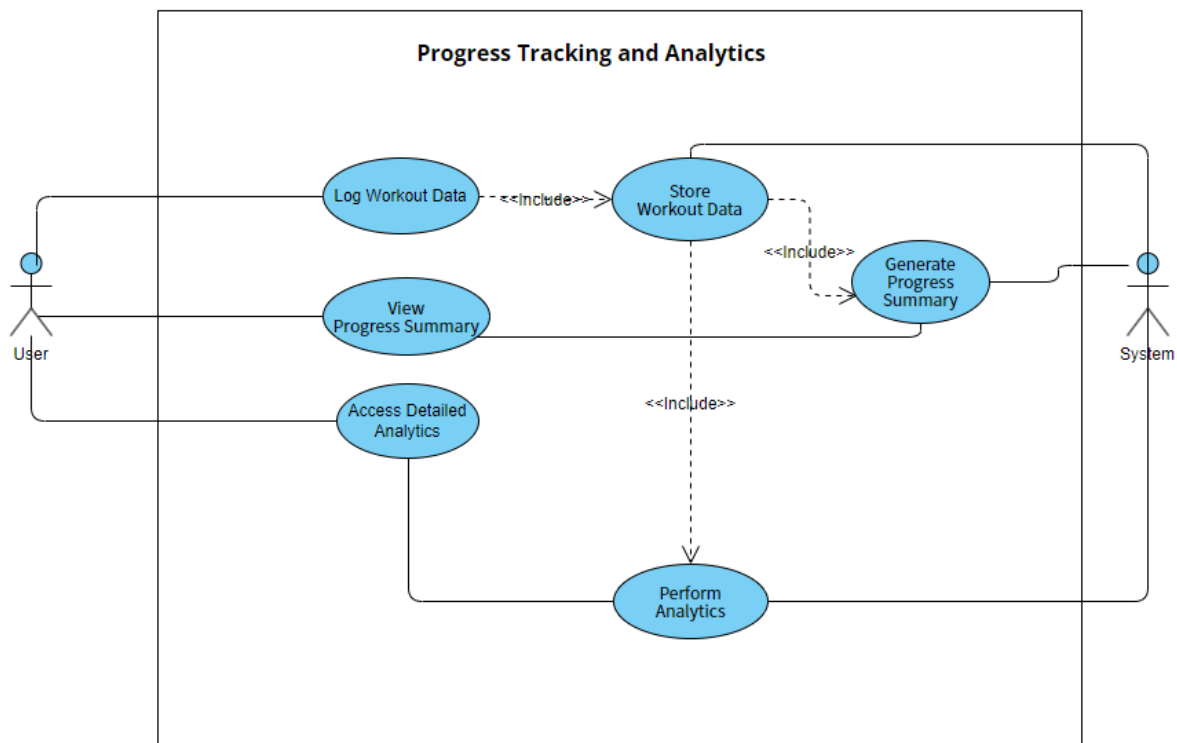

3.4.3 Use Case 3: Workout Plan Customization
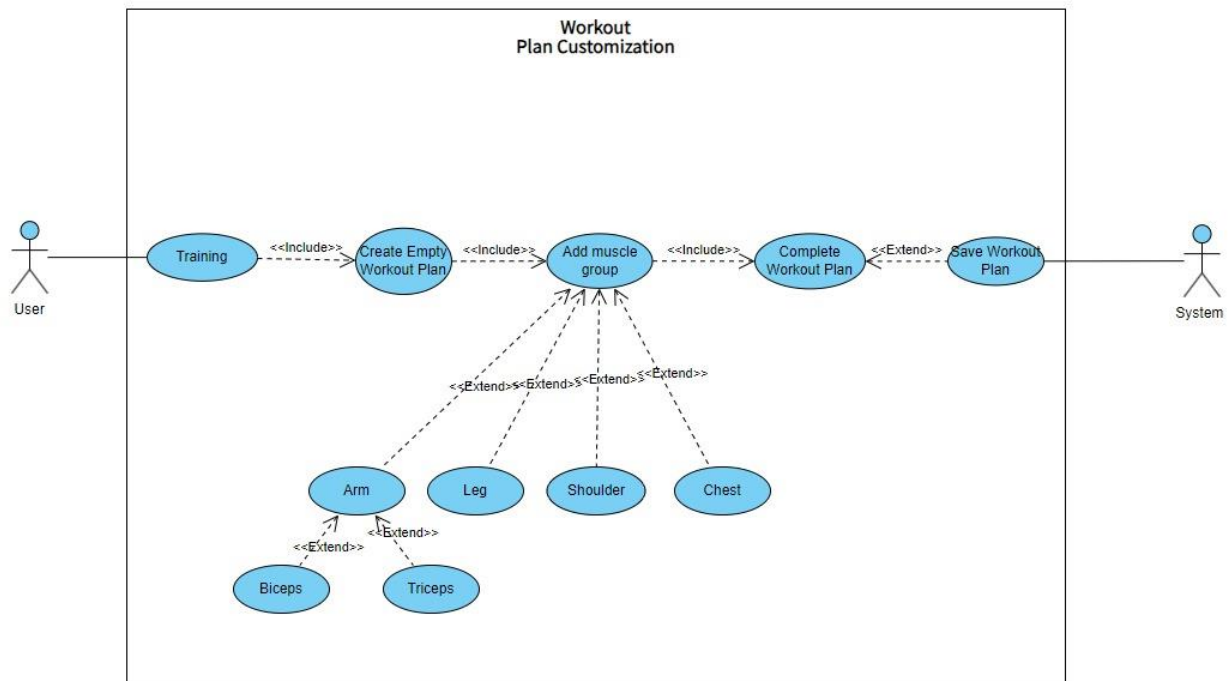
3.4.4 Use Case 4: Motical Features

3.4.5 Use Case 5: Progress Tracking and Analytics

Progress Tracking and Analytics

4. AccessFit Use Case Descriptions

4.1 User Registration and Profile Management

Sign Up: The user registers to the system by creating an account.
Create Username and Password: The user sets up their username and password for the account.
Update Database: The system stores or updates user information in the database.
Sign In: The user logs in to the system by entering credentials.
Enter Username and Password: The user provides their username and password to authenticate.
View Profile: The user views their profile details stored in the system.
Edit Profile: The user modifies their profile information.
Update Profile: The system updates the user's profile details after editing.

4.2 Barcode-Based Entry System

Scan Barcode: The user scans their barcode for system access.
Create Barcode: The system generates a unique barcode for the user.
Validate Access: The system checks if the scanned barcode is valid.
Grant Access: The system allows the user to enter if validation is successful.
Access Denied: The system denies entry due to invalid barcode or other issues.
No Existing Membership Warning: The system notifies the user if they do not have an active membership.
Repeated Entrance Attempt Warning: The system alerts the user about repeated failed attempts.
Keep Login Statistics: The system records data about the user's access attempts.

4.3 Workout Plan Customization

Training: The user engages in a training session by creating a workout plan.
Create Empty Workout Plan: The user initializes a new workout plan without predefined exercises.
Add Muscle Group: The user adds specific muscle groups to the workout plan.
Arm: The user includes arm exercises in the workout plan.
Biceps: The user adds biceps-specific exercises to the arm category.

Triceps: The user adds triceps-specific exercises to the arm category.
Leg: The user includes leg exercises in the workout plan.
Shoulder: The user includes shoulder exercises in the workout plan.
Chest: The user includes chest exercises in the workout plan.
Complete Workout Plan: The user finalizes the workout plan with all selected exercises.
Save Workout Plan: The system saves the completed workout plan for future use.

4.4 Moticational Features

Receive Workout Reminder: The user gets notifications about upcoming workouts.
Earn Achievement Badge: The user earns badges for completing specific fitness goals or milestones.
View Motivation Feed: The user views a feed that displays motivational content and updates.
Send Workout Reminder: The system sends notifications to remind the user of their workouts.
Track User Activity: The system monitors the user's fitness activities and progress.
Award Achievement Badge: The system assigns badges to the user upon reaching milestones.
Update Motivation Feed: The system updates the motivation feed with the user's achievements or related content.

4.5 Progress Tracking and Analytics

Log Workout Data: The user inputs their workout details into the system.
View Progress Summary: The user views a summarized report of their fitness progress.
Access Detailed Analytics: The user accesses in-depth insights and analytics about their fitness activities.
Store Workout Data: The system saves the logged workout information for future use.
Generate Progress Summary: The system creates a summarized report based on the user's stored workout data.
Perform Analytics: The system processes the workout data to generate detailed analytics.

5. Non-Functional Requirements of AccessFit

Performance	-The app should ensure minimal latency during barcode scanning and entry validation.
Scalability	-The system should manage high user activity without slowing down. -The backend should be ready for future connections with new equipment or external services.
Usability	-The app interface should be intuitive, allowing new users to navigate easily without a steep learning curve. -Clear prompts and feedback should guide users through the barcode scanning and workout tracking processes.

Reliability	-The app should be consistently available with minimal downtime.
Compatibility	-The app should be compatible with major mobile operating systems (iOS and Android). It should also function across a range of devices, including smartphones and tablets.
Maintainability	-The code should be easy to understand and update, with clear documentation for future developers. -The app's design should be flexible, allowing changes or improvements to specific features without affecting the whole system.

6. Sample User Scenario

Persona: Berk, a 30-year-old office worker who is new to fitness.
Goals:
- Establish a consistent workout routine.
- Track progress and stay motivated over time.

6.1 Registration and Profile Management
Berk discovers AccessFit while searching for a fitness app to kickstart his gym journey. He downloads the app and completes the registration process by providing his email, creating a password, and filling out his profile.
- **Actions:**
  - Inputs his name, age, gender, and fitness goals (e.g., "build strength" and "increase consistency").
  - Selects his current fitness level (beginner) and preferred workout schedule (e.g., Monday, Wednesday, Friday).
  - Updates his profile picture and personal preferences to make his experience personalized.
- **System Response:**
  - AccessFit saves Berk's data securely in its database and sets up his account.
  - The app generates a unique barcode for Berk to use at the gym.

6.2 Barcode-Based Access Control
Excited to start his journey, Berk visits his gym for the first time after registering on AccessFit.

- **Actions:**
  - Opens the AccessFit app on his phone and navigates to the "My Barcode" section.
  - Scans the barcode at the gym's entry system.
- **System Response:**
  - The gym's scanner validates Berk's membership by checking the barcode against AccessFit's database.
  - After successful validation, Berk is granted access to the gym.
  - The system logs Berk's entry for future tracking.

6.3 Personalized Workout Plan Creation

Once inside the gym, Berk explores the app's workout planning feature to help him create a routine that suits his beginner level.

- **Actions:**
  - Navigates to the "Workout Plan" section and selects "Create Plan."
  - Adds exercises for different muscle groups, such as squats (legs), bench press (chest), and shoulder press.
  - Sets the number of sets and repetitions for each exercise.
  - Saves the plan for future use.
- **System Response:**
  - The app provides guidance for each exercise, including demonstration videos and tips.
  - Berk's workout plan is saved to the cloud, and he can access it anytime.
  - A notification reminds him of his first workout session based on his schedule.

6.4 Motivational Features

To keep Berk motivated and consistent, AccessFit sends him reminders and tracks his progress.

- **Actions:**
  - Receives a motivational notification the night before each workout, saying, "Don't forget your workout tomorrow! Stay consistent, Berk!"
  - After completing a week of workouts, earns an "Consistency Badge" for staying on track.
- **System Response:**
  - Tracks Berk's activities and adjusts motivational messages based on his consistency.
  - Updates the motivational feed with achievements and progress to keep Berk engaged.

6.5 Progress Tracking and Analytics

After four weeks of consistent workouts, Berk checks his progress on AccessFit.

- **Actions:**
  - Opens the "Progress" section to view his analytics.
  - Reviews detailed charts showing improvements in strength, consistency, and workout frequency.
  - Downloads a weekly progress summary to share with his gym trainer for feedback.

- **System Response:**
  - Provides an overview of his logged workouts, total weights lifted, and areas of improvement.
  - Suggests increasing the intensity of certain exercises based on his performance trends.

6.6 Long-Term Engagement

After seeing positive results and earning several achievement badges, Berk feels motivated to continue his fitness journey. AccessFit keeps him engaged by:

- Updating his workout plan to intermediate difficulty after eight weeks.
- Sending personalized reminders and offering new badges for milestones like "First 10 Gym Visits."
- Allowing Berk to interact with motivational content and compare his progress with his previous results.

7. References

1. *Maksisoft Teknoloji Ofisi – Akıllı otomasyon Sistemleri*. (n.d.). https://maksisoft.com

2. MacPlus. (n.d.). *MacPlus Mobile Features*. https://www.macfit.com/en/mac-plus-mobile/features