

# GYMILY: A Smart Pay-Per-Use Gym Access and Management Platform

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## ABSTRACT

**GYMILY introduces a pay-per-use gym access solution through a smart QR-based attendance and payment platform. Implemented using Supabase and Vercel, the app enables users to work out at participating gyms without long-term commitments. Gym owners benefit from integrated CRM and real-time analytics tools. The platform ensures secure transactions, scalable deployment, and convenience for both users and gym owners. The application's architecture is based on a modular system with RESTful API integration, and its impact has been evaluated through usability testing and performance benchmarking. The proposed solution aims to enhance the overall gym-going experience and provide flexibility to users while offering business tools for gym owners.**

**Keywords — Attendance, Fitness App, Gym Management, QR Code, Supabase, Vercel, Wallet System, Pay-per-Use, Mobile Application**

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## INTRODUCTION

In recent years, the awareness and importance of health and fitness have significantly increased, resulting in a surge in the number of individuals joining gyms. However, traditional gym membership systems are inflexible and do not accommodate modern, mobile lifestyles. Many individuals travel for work or education and find themselves unable to access gym facilities because their existing memberships are bound to a single location.

The traditional gym access model locks users into fixed monthly or yearly contracts, often leading to underutilisation and financial waste. In addition, small or independent gyms struggle to compete with large franchises due to a lack of digital infrastructure. Users also face a lack of real-time information, such as gym crowd status, pricing options, or flexible plans.

To solve these challenges, GYMILY was developed as a digital platform that provides pay-per-use access to gyms via QR code check-in, secure wallet payments, and dynamic user-gym interaction. The solution empowers users to train anywhere, anytime, without being restricted to a single location or long-term contract. Gym owners, in turn, benefit from free access to a customer relationship management dashboard that allows them to track attendance, view earnings, and manage operations seamlessly.

GYMILY uses modern development tools and platforms including Supabase, an open-source backend-as-a-service, and Vercel, a server less deployment platform for frontend applications. Razorpay is used for payment integration. The combined technology stack enables rapid development, scalability, and cost efficiency.

## SYSTEM ARCHITECTURE

The system is composed of three major user roles—user, gym owner, and admin. Each role is served by a dedicated application interface.

- **Users** use the mobile app to register, search for gyms, scan QR codes to check in, and make payments via their in-app wallet.
- **Gym Owners** use a web-based dashboard to manage gym attendance, view visitor analytics, generate QR codes, and receive earnings.
- **Admins** monitor and moderate platform activity, approve gym listings, and generate overall system analytics.

Supabase functions as the central backend service provider. It offers real-time PostgreSQL database capabilities, built-in authentication services, and RESTful API integration. Vercel is used for frontend deployment, ensuring fast and secure delivery of web content.

### Architecture Flow Figure

User App → Supabase (Auth + DB) → QR Code Check-in/Check-out  
Gym Owner Dashboard ← Supabase ← Attendance + Revenue Tracking  
Admin Panel → Platform Oversight + Analytics

This architecture ensures that the system remains modular, scalable, and maintainable. All transactions and events are stored in Supabase and queried using lightweight JavaScript-based API endpoints, improving response time and real-time accuracy.

### IMPLEMENTATION AND FEATURES

#### User App

- Register/Login (OTP/Email)
- Wallet Load and Payment
- Discover Nearby Gyms
- QR Code Scanner for Check-In
- View History and Ratings

#### Gym Owner Dashboard

- Register Gym and Generate QR
- View Visitor Logs
- Revenue and Attendance Analytics
- Offer Discounts

#### Super Admin Panel

- Manage Users and Gym Listings
- Approve New Gyms
- Track Platform Activity
- Handle Support Tickets

#### Technologies used:

- Supabase: Authentication, Database, API
- Vercel: Web hosting for dashboards
- Razorpay: Secure transactions
- Figma: UI Prototyping
- Expo: React Native Testing

### RESULTS AND EVALUATION

A complete system test was conducted in a controlled environment simulating real-world gym operations. QR scanning was tested across multiple devices and operating systems. Performance metrics focused on transaction speed, interface responsiveness, and API call latency.

#### Performance Benchmarks

- **QR Check-In Time:** 1.5–2.3 seconds
- **Wallet Transaction Delay:** <1 second
- **Admin Dashboard Data Refresh:** 500 ms average
- **Owner Revenue Analytics Load Time:** ~1.2 seconds

The system was rated highly by early test users:

- **Usability Score:** 4.7/5 (10 participants)
- **Response Accuracy:** 100% across 50 test QR scans
- **System Downtime (test window):** 0%

User feedback highlighted the convenience of not needing to negotiate temporary gym access. Gym owners appreciated the clean UI of the dashboard and found it easier to manage visitor traffic.

Limitations identified include dependency on stable internet access for real-time QR scan processing and the current absence of a native iOS build. These are prioritised for future updates.

## CONCLUSION

GYMILY addresses a real-world challenge in the fitness domain by offering a practical, flexible, and technology-driven solution. By eliminating the limitations of traditional gym memberships and empowering users with universal access via mobile devices, the platform redefines how people engage with fitness spaces. Gym owners benefit equally from increased visibility, simplified management, and revenue opportunities.

Technologies like Supabase and Vercel reduce infrastructure complexity and enable fast, secure deployments. With its modular design, the platform is easily extendable and capable of serving broader use cases such as corporate fitness plans, university campuses, and even hotel guest fitness access.

Future developments will include AI-based workout recommendations, trainer booking integrations, IoT support for gym equipment, and a community feature for group fitness activities.

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**Author Biography:** **Ishan Mishra** is a postgraduate student enrolled in the MCA Online Program at Lovely Professional University, Punjab, India. He specialises in full-stack web and mobile development and focuses on building real-world tech-driven solutions that solve everyday problems through scalable software architecture.

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