# LIFT

## YOUR LIFE

LIFT

-LIFT Corporation-

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# 1. Executive Summary

**LIFT** is a shared transportation platform that provides safe, convenient, and cost-effective mobility solutions. Powered by real-time data analytics, LIFT intelligently matches users traveling similar routes and compares ride fares across multiple providers such as Grab, Bolt, Lineman, and others to offer the most efficient and budget-friendly options.

LIFT maximizes vehicle occupancy, reduces travel costs, and minimizes environmental impact by leveraging advanced ride-matching algorithms and automated fare-splitting. The platform helps ease traffic congestion and supports the reduction of $CO_2$ emissions and PM2.5 levels, contributing to cleaner, greener urban environments.

Key features include:

- Real-time fare comparison across providers
- Automated, secure payment processing
- Safety tracking and user verification
- Custom solutions for corporate ride-sharing
- Ride matching

Designed for scalability, user convenience, and sustainability, LIFT aims to redefine urban mobility and empower individuals and organizations to participate in a smarter, more eco-conscious transportation ecosystem.

# 2. Background & Problem Statement

Urban traffic congestion imposes significant economic and time-related costs on commuters. Studies indicate that over 75% of Taxi and Grab rides exceed 150 Baht, while the average household income remains around 30,000 Baht, making daily ride-hailing services financially unsustainable for many. This affordability gap highlights the need for a more cost-effective mobility solution.

# 3. Market Opportunity and Competitor Analysis

Current mobility solutions fall short in addressing these urban challenges. There is a notable absence of intelligent, shared mobility platforms that offer real-time ride matching, automated fare splitting, and scalable, eco-friendly alternatives.

## 3.1 SWOT Analysis

| Strengths | Weaknesses |
|---|---|
| • Supports eco-friendly<br>• cost-effective transport<br>• Ride matching & fare comparison | • Reliant on third-party providers (e.g., Grab, Bolt)<br>• User trust & adoption barriers |

| | |
|---|---|
| • Automated fare-splitting & secure payments | |
| **Opportunities** | **Threats** |
| • Partnership with companies and green initiatives to scale impact. For example SCB, True, Modernform<br>• Expansion into Upcountry, eg, Chiang Mai, Khon Kaen, and Phuket, which lack public transportation service.<br>• Lack of direct competitors in shared ride service. | • Strong competition from major ride-hailing apps<br>• Data privacy & regulatory risks.<br>• Service reliability linked to provider availability. |

## 3.2 Competitor Analysis

| Features / Factor | Lift | Grab | Lineman | Bolt | Traditional Taxi |
|---|---|---|---|---|---|
| Booking Purpose | Shared pricing for group trips. | Private trips. | Private trips. | Private trips. | Private trips. |
| Pricing | Shared/optimized pricing by group. | Higher per trip. | Higher per trip. | Lower than Grab. | Metered, can be higher in heavy traffic. |
| Peak Hour Availability | Matches users to share during demand peaks. | Shortage of drivers after 17:00. | Shortage of drivers after 17:00. | Limited availability. | Very limited and inconsistent |

## 3.3 Customer Analysis

- **Target Group**

The primary target group for LIFT is office workers in GBKK who commute during rush hours and are looking for a more affordable, convenient, and safer alternative to traditional public transport or private ride-hailing services.

Who: Office employees whose workplaces are not located near public transportation routes.

What: Want to reduce travel expenses from private rides (e.g., Grab, taxis) and avoid using their own cars.

When: Commute during peak hours—morning (07:00–09:00) and evening (17:00–20:00).

Where: Dense office areas in Bangkok are not directly connected to BTS/MRT lines.

Whom: Willing to share rides with others going in the same direction, provided the app has a safe and reliable matching system.

Why: Monthly transportation costs are too high, and waiting for a ride takes time, especially during peak hours.

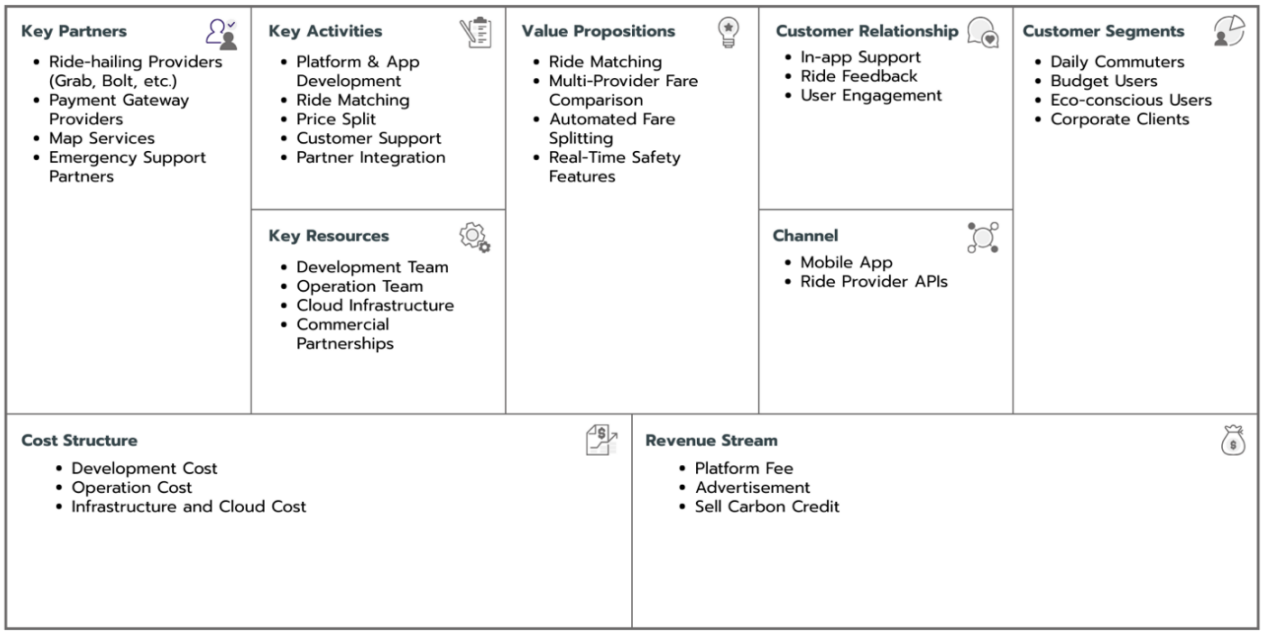
How: Use the LIFT app to book a shared ride and split travel costs automatically.

- **Voice of Customer**

"I spend hundreds of baht each day just for commuting. If there's a cheaper alternative, that would be amazing."— Ingfah, Office worker near Asoke

"Sometimes, Grab drivers just don't show up, especially in the evening. I wish there was a system that could match me with others going the same way so we can share a ride."— Tawan, IT staff in Silom.

## 4. Business Model Canvas




## 5. Vision, Mission, and Strategic Objectives

### 5.1 Vision

Our vision is to transform urban transportation by seamlessly connecting passengers with similar routes, creating a smarter and more efficient way to travel. Through innovative route matching and shared mobility solutions, we

aim to optimize transportation costs while prioritizing convenience, safety, and environmental sustainability.

### 5.2 Mission

Our mission is to develop LIFT as a solution that promotes shared travel, making transportation more efficient, sustainable, and accessible. By optimizing route matching, the platform reduces congestion, lowers pollution, and mitigates PM2.5, all while ensuring a safe and eco-friendly travel experience.

### 5.3 Business Strategies

**Cost leadership**

Maximize cost savings for passengers through automated and fair fare splitting, making shared transportation a more affordable and appealing option.

### 5.4 Marketing Strategies & Launch Plan

- **Offline**
  - RoadShow - mascots, pretty boots to encourage downloading the LIFT app.
  - Advertising - on Bus, Taxi, Billboard
- **Online**
  - Lunch Marketing Ad on Facebook, YouTube, and personalization with a target
    - age <= 30
    - social economics status <= C (35000 baht)
    - location in GBKK

## 6. Data Strategy Framework

- Cost leadership
- Ease of use

### 6.1 Identify Data Assets

- Profile User Data is getting while the user registers
  - Source: User filled in Lift Application
  - Format JSON from the application
  - Storage in RDMS
  - Schema
    - Name (PII)
    - Phone Number (PII)
    - Payment details

        - Favorite Place (Indirect PII)
- Trip Route Making Match
    - Source: User filled in Lift Application
    - Format JSON from the application
    - Storage in the Queue Database for Matching
    - Process Matching by Asynchronous Worker
    - Schema
        - Pickup latitude/longitude
        - Drop-off latitude/longitude
        - Number of passengers
- Driver Part getting from the third Party/supply APIs while the trip is making
    - Source from Third Party
    - Format JSON from the APIs
    - Storage in RDMS
    - Schema
        - Name (PII)
        - Contact Phone Number (PII)
        - Driver Plate car (PII)
- Current Location
    - Source Device user, Driver
    - Format JSON from the application
    - Storage in Memory Database for short-term
    - Schema
        - Timestamp
        - User_id
        - Lat
        - Long
- Route Path
    - Source Googlemaps APIs
    - Format JSON from the APIs
    - Storage RDMS/GIS

## 6.2 Data Roles & Responsibilities

- Project Management Team
  Purpose: Ensure effective execution and overall success of the project.
  Responsibilities:
    1. Oversee project timelines, deliverables, and facilitate coordination among all teams involved.
    2. Monitor progress and provide regular updates and reports to the Project Committee.

- Development Team

  Purpose: Design, build, and implement the LIFT platform to provide a seamless, reliable, and scalable user experience.

  Responsibilities:

  1. Develop and maintain all core platform components, including mobile applications, backend infrastructure, and APIs.
  2. Ensure system stability, robust security, and high availability to maintain consistent platform performance.
- Data Team

  Purpose: Leverage AI and data analytics to enhance ride-matching efficiency and optimize pricing strategies.

  Responsibilities:

  1. Develop and continuously improve AI-powered ride-matching algorithms.
  2. Implement real-time dynamic pricing models responsive to demand and market conditions.
- Operation Team

  Purpose: Deliver user support and ensure smooth platform operations.

  Responsibilities:

  1. Manage customer service, resolve ride-related disputes, and coordinate emergency responses.
  2. Monitor user feedback and address operational challenges to continuously improve service quality.
- Marketing Team

  Purpose: Drive business growth through strategic partnerships, effective monetization, and market expansion initiatives.

  Responsibilities:

  1. Design and optimize revenue models, including fare structures, promotional strategies, and advertising opportunities.
  2. Conduct comprehensive market research to identify and pursue opportunities for regional expansion and new service offerings.

## 6.3 Data Policies and Quality Standards

### 6.3.1 Expectation of High-Quality Data

| Stakeholder | High-Quality Data | Low-Quality Data |
|---|---|---|
| **Users** | Ensure user profiles are complete with verified identity and accurate contact details to | Incomplete profiles, fake or duplicate accounts, and unverified identities: |

| Stakeholder | High-Quality Data | Low-Quality Data |
|---|---|---|
| | enhance trust and service reliability:<br>**- Email:** Required field (not null) to ensure identification.<br>**- Phone Number:** Required field (not null) to ensure identification and verification by **OTP**.<br>**- Profile Name:** Required field (not null).<br>**- User Payment Information:** Card numbers and bank account details must be free of errors and follow standardized formats.<br>**- Geolocation:** Required field (not null) for pick-up and drop-off. | **- Email:** Missing or Fake Email – Reduces communication reliability.<br>**- Phone Number:** Invalid or Unverified Phone Number – Leads to failed OTP verification.<br>**- Profile Name:** Generic or Fake Profile Names – Affects trust and personalization.<br>**- User Payment Information:** Incomplete Card/Bank Details such as missing digits, incorrect expiration dates, or invalid CVV codes.<br>**- Geolocation:** Wrong pick-up or drop-off leads to an over- or underprice estimate. |
| **Drivers (3rd -Party)** | All transactions must be ACID, error-free, and fully recorded. Accurate driver identity and transport details, ensuring completeness and reliability:<br>**- License Plate:** Must be present (not null) and follow a standard alphanumeric format with validation rules. Verify by Car Registration.<br>**- Driver Name:** Required field (not null) to ensure identification and accountability.<br>- **Phone Number:** Required field (not null) with a validated format (+66 (0) followed by nine digits) to enable effective communication. | **- License Plate:** Null, missing, or incorrect format.<br>**- Driver Name:** Missing, incomplete, or does not match the assigned driver in the third-party system.<br>**- Phone Number:** Missing or null.<br>**- Pricing:** null, incorrect lead to wrong change, so the user can make a loss of profit.<br>**- Incorrect or missing timestamps:** leading to reconciliation issues and transaction disputes.<br>**- Incorrect or missing pickup estimates:** causing delays and confusion for customers. |

| Stakeholder | High-Quality Data | Low-Quality Data |
|---|---|---|
| | - **Pricing:** Required field (not null) for split pricing fee<br>- **Trip Date:** Transactions must have a correct timestamp for tracking and reconciliation.<br>- **Estimate Time to Pickup:** Transactions must include a correct estimated time for pickup, ensuring accurate tracking and user updates.<br>- **Estimate Time to Drop-off:** Transactions must include a correct estimated time for drop-off, ensuring accurate ride completion tracking.<br>- **Estimate Time to Drop-off:** Transactions must include a correct estimated time for drop-off, ensuring accurate ride completion tracking.<br>- **Distance:**<br>The total distance traveled must be accurately recorded for fare calculation and trip tracking.<br>Must match the actual route taken based on GPS data. | - **Missing or inaccurate drop-off estimates:** leading to unreliable service expectations.<br>- **Inaccurate trip distances:** lead to incorrect fare charges.<br>Missing or incorrect distance data, causing billing discrepancies. |
| **Payment Providers (3rd-Party)** | All transactions must be ACID, error-free, and fully recorded, ensuring correct fare calculations and complete reconciliation without discrepancies:<br>- **Fare:** Payment amounts should be based on accurate distance, time, and applicable fees. | - **Fare:** Payment amounts are miscalculated due to inaccurate distance, incorrect time tracking, or missing fees, leading to overcharging or undercharging.<br>- **Payment Details:** Transactions have incomplete records and are missing critical fields such as user ID, payment method, or timestamp. |

| Stakeholder | High-Quality Data | Low-Quality Data |
|---|---|---|
| | - **Payment Details:** Every transaction must have a complete dataset, including user ID, payment method, timestamp, and amounts<br>- **Payment Status:** Transactions should be confirmed instantly with clear status updates such as 'Pending,' 'Completed,' 'Failed'<br>- **Payment Date:** Transactions must have a correct timestamp for tracking and reconciliation. | - **Payment Status:** Transactions lack real-time updates or have unclear status labels, causing confusion (e.g., missing statuses, duplicated statuses).<br>- **Incorrect or missing timestamps:** leading to reconciliation issues and transaction disputes. |
| **Lift Data** | - **Split price:** Required field for change for each user for the trip.<br>- **Passenger Group:** Maintain a correct and updated list of passengers sharing a ride. Ensure passengers are matched based on similar routes and timing. Verify that the sequence of pickups and drop-offs is optimized.<br>- **Trip Date:** Transactions must have a correct timestamp for tracking and reconciliation. | - **Split price:** incorrect leads to loss of profits or user trust.<br>- **Incorrect passenger matching:** leading to inefficient routes and delays. Missing or outdated pooling data, causing passenger confusion and service disruptions. Unoptimized pickup/drop-off orders increase travel time and costs.<br>- **Incorrect or missing timestamps:** leading to reconciliation issues and transaction disputes. |

#### 6.3.2 Data Quality Strategies

##### Cost Leadership: Data-Driven Strategies

###### 1. Optimize IT Infrastructure

- Design a low-cost, reliable IT architecture to support daily operations with minimal overhead.
- Use scalable cloud-native solutions for automation, load balancing, and pay-as-you-go pricing.
- Consolidate systems and tools to reduce software licensing, integration, and maintenance costs.

### 2. Reduce External API Costs with Smart Caching

- Cache frequently used routes when pickup/drop-off locations are the same or nearby to avoid repeated Map API calls.
- Leverage IoT devices to collect and reuse real-time route data.
- Apply clustering algorithms to group similar locations and further reduce API usage.

### 3. Simplify User Experience to Reduce Operational Overhead

- Automatically fill in common fields (Name, Email, Phone). Enforce proper formatting to minimize errors and reduce customer support load.
- Suggest frequently used pickup/drop-off points.
- Allow users to select saved locations with a single tap.
- Enable users to link and store payment methods securely.
- Avoid repeated input by using stored credentials for faster checkouts.

## 6.3.3 Scope of Initial Assessment

- **User Data**

  User data is classified as critical because it directly affects system operations and decision-making. Since human errors can occur, proper validation and handling are essential.

  **Existing rules and patterns:**

  - **Email**: Ensure a valid email format using regex validation. (e.g.,user@example.com)
  - **Phone_Number**: Ensure valid compliance format, only 10 digits, and correct by using OTP to verify.
  - **Profile Name**: Must contain only alphabetic characters (with optional spaces) and be at least 2 characters long to ensure a valid user identity. Special characters and numbers should be restricted.
  - **Payment_Method**: Ensure valid compliance format, only 16 digits, and correctly verified by the payments provider, and check the Regex on input patterns.
  - **Geolocation Pickup/Drop-off**: Ensure latitude (Lat) and longitude (Lon) are within the predefined service area (GBKK).

- **Lift Data**

  Lift data is essential for ensuring accurate fare calculations, efficient ride-sharing, and seamless platform operations. It includes pricing details, ride pooling lists, and trip-related

metadata, which directly impact user experience, cost distribution, and business revenue.

**Existing rules and patterns:**

- **Price:** Ensure values are stored in decimal format (e.g., 100.00 THB) and match the selected payment method.
- **Passenger Group:** Each pooled ride must include unique user IDs of all passengers.
- **Trip Date:** Ensure it has been timestamped in the format ISO-8601

### 6.3.4 Perform Initial Data Quality Assessment

| Data Attribute | Assessment Criteria | Finding & Issues |
|---|---|---|
| Phone_Number | Check if all numbers have 9 digits and are OTP-verified. | - 95% successfully verified via OTP.<br>- 5% invalid numbers or missing OTP verification. |
| Payment_Method | Ensure 16-digit format, valid provider verification. | - 98% valid<br>- 2% incomplete card details or incorrect format |
| Geolocation (Pickup/Drop-off) | Ensure latitude (Lat) and longitude (Lon) are within the predefined service area (GBKK). | - 90% of locations correctly fall within the service area.<br>- 10% of users manually drop inaccurate pins, leading to mismatched pickup points or unavailable services. |
| Email | Ensure Email is in a valid format and successfully verified via the confirmation link. | - 97% verified emails<br>- 3% invalid or unverified |
| Profile Name | Ensure the name follows validation rules:<br>- Minimum 2 characters, Maximum 64 characters<br>- No numeric-only names<br>- No special characters or emojis. | - 96% valid profile names<br>- 2% too short or too long<br>- 1% numeric-only names<br>- 1% names with special |

| Data Attribute | Assessment Criteria | Finding & Issues |
|---|---|---|
| Price | Ensure values are stored in decimal format (e.g., 100.00 THB) and match the selected payment. | - 98% correct decimal format<br>- 2% incorrect rounding or mismatched payment method |
| Passenger Group | Each pooled ride must include unique user IDs of all passengers. | - 97% of unique user IDs stored correctly<br>- 3% duplicate or missing user IDs in pooled |
| Trip Date | Ensure timestamp is stored in ISO-8601 format (YYYY-MM-DDTHH:MM: SSZ). | - 99% ISO-8601 formatted timestamps<br>- 1% incorrectly formatted timestamps or missing values |

### 6.3.5 Identify & Prioritize Improvements

| Data Attribute | Issue Identified | Proposed Improvement | Priority | Timeline | Expected Outcome |
|---|---|---|---|---|---|
| Phone_Number | Incorrect format | - Enhance Application on Register check format 10digits ^0[689][0-9]{8}$ | **High** (Direct impact on ride-matching) | 1 month | Zero incorrect format for new user |
| Payment_Method | Incorrect format | - Enhance Applications while adding Payment details check format 16 digits ^([0-9]{16})$ | **High** (Affects trust & user retention) | 2-3 months | Zero incorrect format for new user |
| Email | Incorrect format | - Enhance Applications while add Payment | **High** (Critical for safety & trust) | 2-3 months | Zero incorrect format for new user |

| Data Attribute | Issue Identified | Proposed Improvement | Priority | Timeline | Expected Outcome |
|---|---|---|---|---|---|
| | | details check format ^[a-zA-Z0-9._%+-]+@[a-zA-Z0-9.-]+\.[a-zA-Z]{2,}$ | | | |
| Profile Name | Does not match real names or follow inconsistent naming conventions. | - Enhance Applications while adding Profile name latest A-Z 2 digit ^[a-zA-Z]{2,64}$ | **Medium** (Affects efficiency but not critical) | 1-2 months | Reduce delays, improve route optimization, and provide more efficient ride options |
| Price | Incomplete trip history records | - Enhance data logging mechanisms and introduce auto-recovery for failed transactions.<br>- Implement redundancy in API requests to prevent data loss. | **Medium** (Impacts reporting & analytics) | 1-2 months | Accurate trip data for billing, reporting, and analytics, reduced customer disputes |
| Passenger Group | Missing or incorrect passenger assignments | - Improve pooling algorithms to match riders based on optimized routes and timing | **Medium** (Impacts service efficiency) | 2 months | Better ride-matching, reduced detours, improved passenger experience |

| Data Attribute | Issue Identified | Proposed Improvement | Priority | Timeline | Expected Outcome |
|---|---|---|---|---|---|
| | | - Validate pickup/drop-off sequence to minimize delays | | | |
| Trip Date | Missing or inconsistent timestamps | Ensure all trips have properly recorded start and end timestamps<br>- Introduce automated error detection for incorrect trip date formats | **High** (Affects billing and compliance | 1 month | Accurate trip records, reduced disputes, and compliance with logging standards |

### 6.3.6 Data privacy and Ethics checklist

- Data Collection, Consent & User Rights
  - Clearly inform users about what data is collected.
  - Obtain explicit user consent for data collection, processing, and sharing.
  - Allow users to access, edit, and delete their personal data upon request.
  - Provide a privacy policy in clear, non-technical language.
  - Notify users of any data breaches or unauthorized access within the legally required timeframe.
- Data Security, Protection & Compliance
  - Encrypt personal, financial, and any sensitive data to prevent unauthorized access.
  - Regularly conduct security audits and penetration testing to detect vulnerabilities.
  - Adhere to PDPA and other data protection laws.
  - Maintain a data retention policy, specifying how long user data is stored and when it is deleted.
  - Ensure third-party ride-hailing providers comply with the same data protection standards.

- Responsible Data Sharing & Third-Party Integration
  - Limit data sharing with external parties to only what is necessary for service functionality.
  - Require third-party partners (e.g., Grab, Bolt, payment providers) to comply with LIFT's privacy policies.
  - Implement secure API connections to prevent unauthorized data access.

## 6.4 Data Governance Processes

**Step1:** Establish Governance Framework - Define objectives, policies, and responsibilities for data governance.

- Define objectives for data accuracy, security, and compliance.
- Identify key stakeholders (Data Governance Committee, IT, Compliance, AI & Analytics teams).
- Develop a data governance policy outlining roles, responsibilities, and compliance requirements.

Responsible: Data Governance Committee, Compliance Team

**Step2:** Data Classification - Identify data types, sources, and access controls.

- Identify and classify data types (e.g., personal data, ride history, payment details).
- Map data sources, storage locations, and third-party integrations.
- Establish access control policies based on data sensitivity.

Responsible: IT Team, Data Governance Team

**Step3:** Implement Data Security - Protect sensitive data and ensure regulatory compliance.

- Encrypt sensitive data (e.g., payment information, user identities).
- Ensure compliance with GDPR, PDPA, and other regulations.
- Conduct regular security audits and penetration testing.

Responsible: Compliance Team

**Step4:** Develop Data Retention and Deletion Policies - Define how long data is retained and establish deletion protocols.

- Define how long data is retained before automatic deletion.
- Implement secure data deletion processes to prevent unauthorized recovery.
- Allow users to request data deletion or modification.

Responsible: Data Governance Team

**Step5:** Third-Party Governance - Manage data sharing policies with external partners.

- Ensure ride-hailing and payment providers comply with LIFT's privacy policies.
- Implement secure API connections to prevent unauthorized data access.
- Regularly review third-party data-sharing agreements.

Responsible: IT Team, Business Partnerships Team

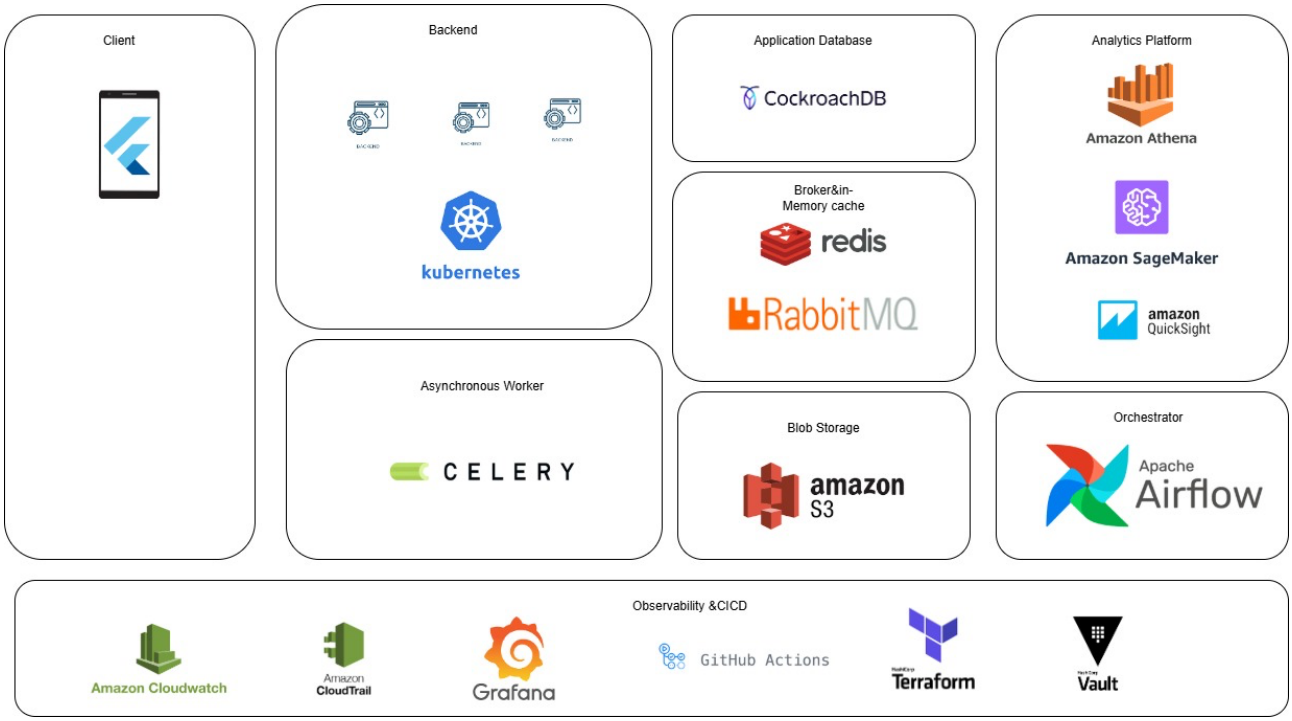
**Step6:** Monitor, Audit, and Continuous Improvement - Review governance policies and improve processes regularly.

- Conduct quarterly governance reviews and compliance checks.
- Gather user feedback on data privacy concerns.
- Update policies based on regulatory changes and emerging technologies.

Responsible: Data Governance Team, Compliance Team

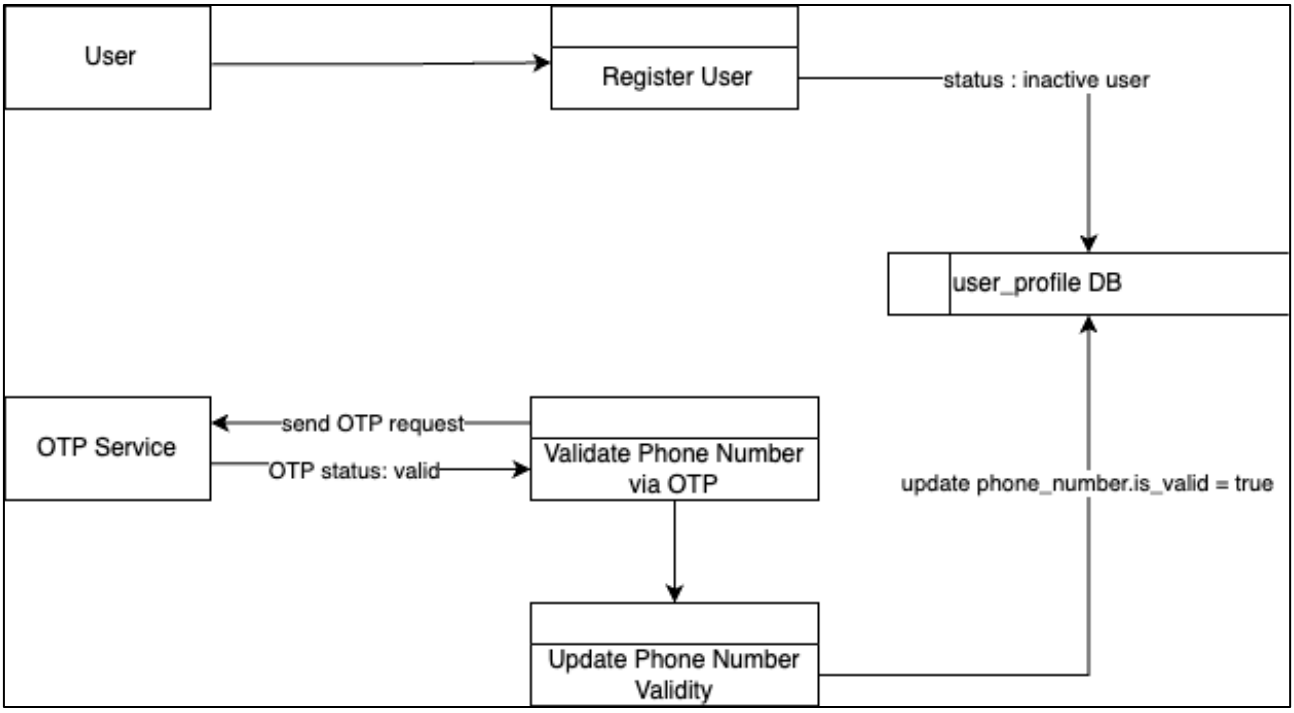
# 7. Data Architecture and Workflow

## 7.1 Architecture Framework

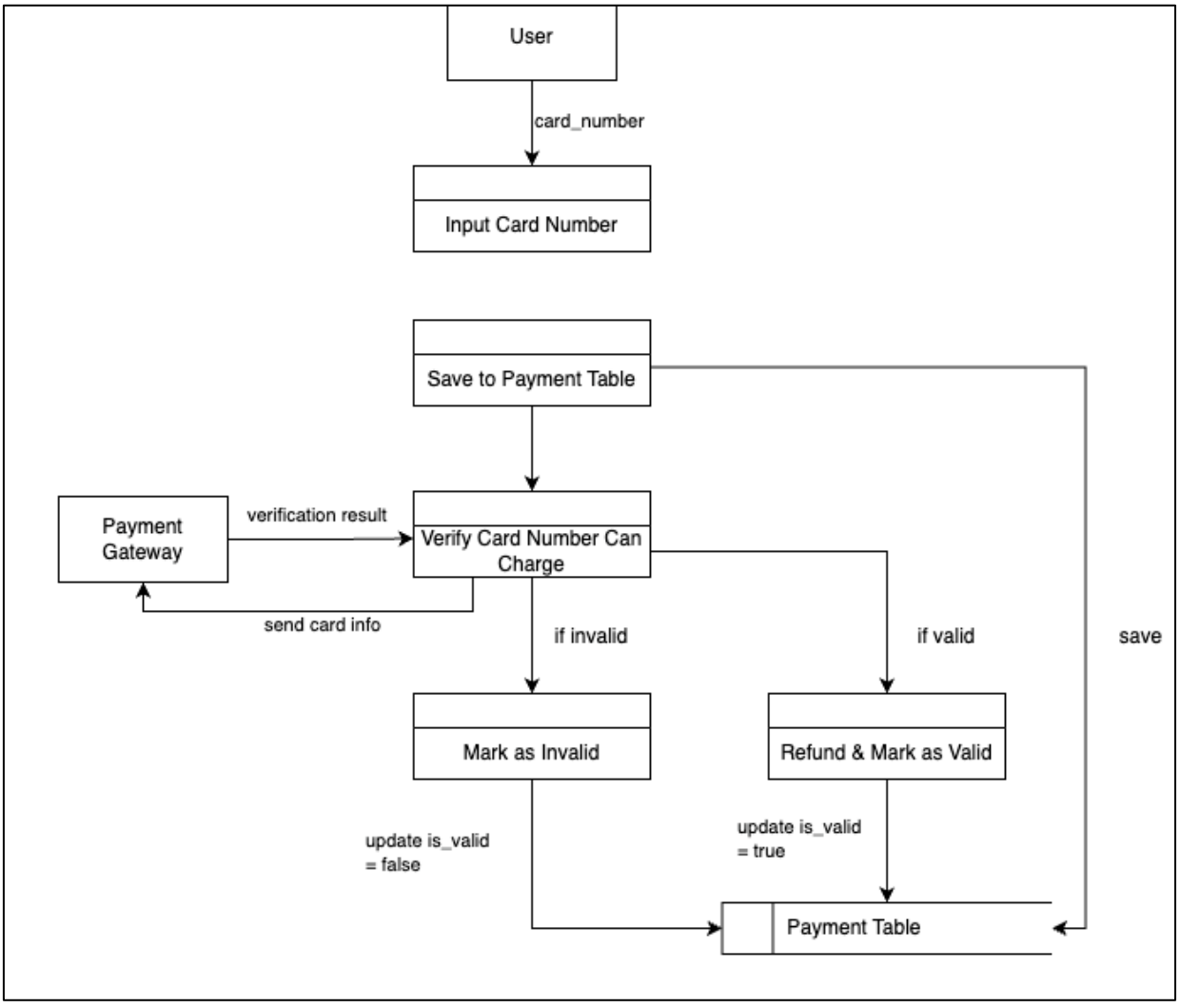


## 7.2 Data Flow Diagrams

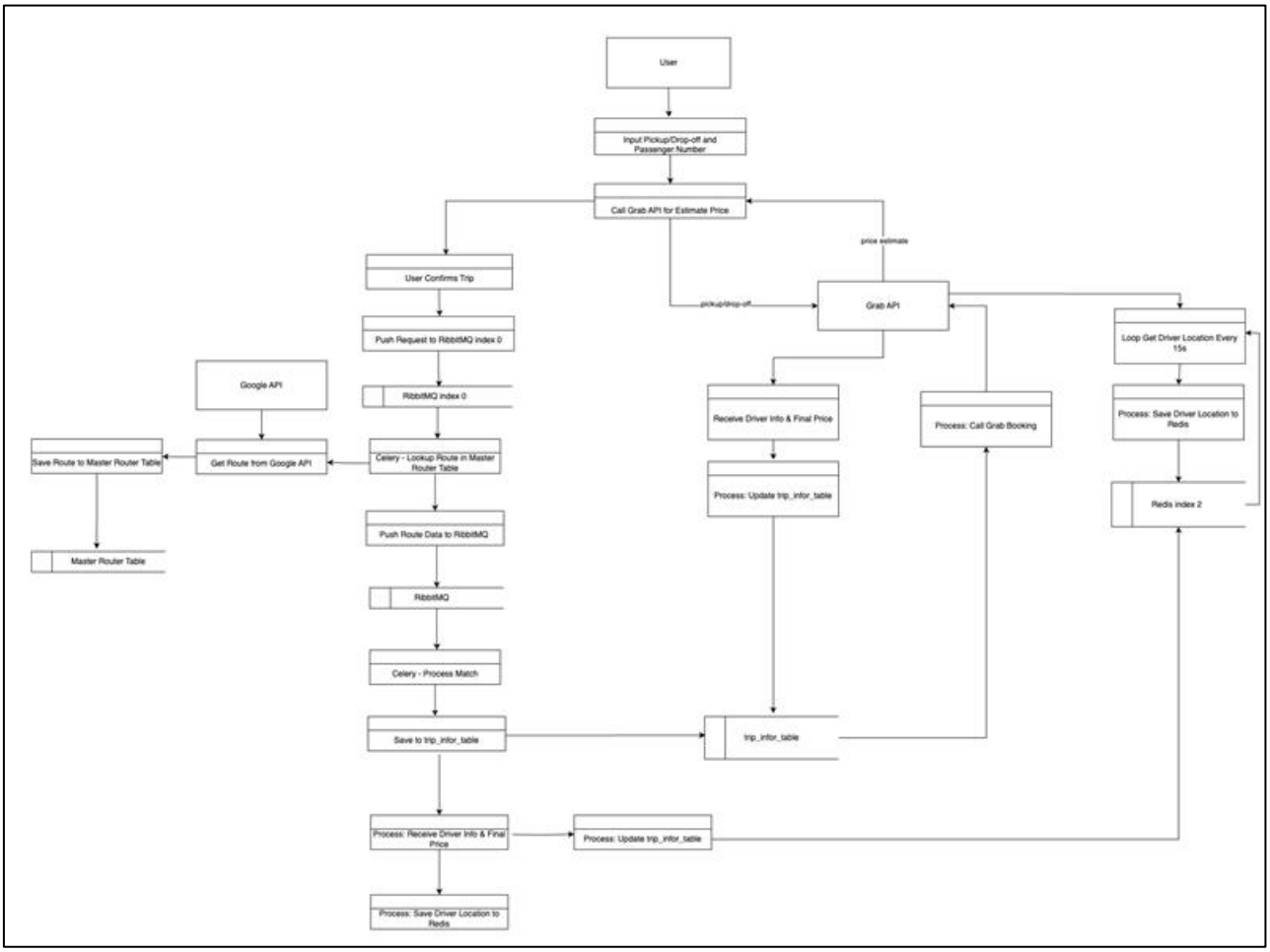
### User Register




### Payment



**Call Driver**




## 7.3 Data Integration

### 7.3.1 Client ↔ Backend Integration (Driver Request)

**Pattern:** Hub-and-Spoke (Loose Coupling)

**Use Case:** When a user requests a ride, the request is sent to a central service (hub), which then routes it to appropriate backend services (e.g., matching, notification, dispatch).

- Why Hub-and-Spoke?
  - Central control over routing, retry logic, and message enrichment.
  - Allows backend services (spokes) to evolve independently.
  - Suitable for scaling and decoupling.
- Implementation Ideas:
  - Use a message queue or event broker (e.g., Kafka, Pub/Sub, or RabbitMQ).
  - Backend services subscribe to relevant event topics.
  - Client calls a lightweight API gateway that publishes to the hub.

### 7.3.2. Third-Party Driver Platform Integration

**Pattern:** Loose Coupling via Asynchronous Messaging or Webhooks

**Use Case:** Allow external partners (e.g., local fleets or individual drivers) to receive ride offers and update statuses.

- Why Loose Coupling?
  - Third-party systems vary; enforcing tight schemas or contracts can break integration.
  - Loose coupling allows retry logic, buffering, and async updates.
- Implementation Ideas:
  - Use webhooks, REST APIs with polling, or event-driven architecture.
  - Use a partner API gateway to abstract and validate external payloads.
  - Store mapping configurations for each third-party in a config registry.
- Benefits:
  - Easier onboarding of partners with different tech stacks.
  - Resilient to delays or temporary unavailability on the partner's side.

### 7.3.3. Backend ↔ Payment Gateway Integration

**Pattern:** Point-to-Point (Tight Coupling)

**Use Case:** Real-time payment processing, refunds, and status updates.

- Why Tight Coupling?
  - Requires strong consistency and immediate responses.
  - High dependency on synchronous API contracts.
  - Payment operations are transactional and secure.
- Implementation Ideas:
  - Use direct REST/HTTPS API integration with retries and error handling.
  - Implement failover logic and logging for compliance.
  - Store transaction logs and status for auditing.
- Risks:
  - High dependency on payment gateway uptime and schema stability.
  - Any change in the API may affect the backend directly.

## 7.4 Data Processing Workflow

**Step1**: **Data Ingestion**

Collect real-time (e.g., live bookings, GPS) and batch data (e.g., ride history, payment logs) from an app, APIs, and partners.

**Step2: Data Validation**

Check for completeness, correctness (e.g,. phone format), and duplicate records.

**Step3: Data Cleaning**

Remove or correct inaccurate data, handle missing values, and standardize formats.

**Step4: Data Storage(EL)**

Load Raw data to Blob storage AWS S3

## 7.5 Analytics Workflow

**Step1: Data Transformation(ETL)**

Convert raw data into clean, business-ready datasets.

**Step2: Data Storage**

Persist transformed data into blob storage across these zones:

- Bronze: Raw, ingested data (minimal transformation)
- Silver: Cleaned and structured data
- Gold: Business-ready, aggregated, analytics-ready data

**Step3: Data Selection**

Choose relevant data fields (e.g., fare, route, ride time) from the Gold layer for analysis.

**Step4: Data Aggregation**

Summarize data for metrics such as average ride cost, matching time, fuel savings, etc.

**Step5: Modeling & AI**

Use ML models for ride-matching and demand forecasting.

**Step6: Visualization and Reporting**

Build dashboards and reports to track KPIs (e.g., $CO_2$ reduction, cost savings) and support business teams.

**Step7: Insight Delivery**

Share results with stakeholders through real-time dashboards, alerts, or periodic reports.

# 8. LIFT Mechanism and Solution Matching

## 8.1 Matching Flow

### 8.1.1 User Ride Request

- A user initiates a trip request by providing:
  - Pickup location
  - Drop-off location
  - Preferred departure time (or time window)

### 8.1.2 Matching Trigger

- When a new ride request is submitted, the system searches for existing requests with compatible routes and times.

### 8.1.3 Matching Logic

- Route Similarity Detection
  - Compute the spatial overlap between user routes using encoded polylines or latitude/longitude clusters.
  - Use algorithms like:
    - Haversine distance
    - Route vector comparison
    - Dynamic Time Warping (for time-distance sequence match)
  - Time Window Tolerance
    - Match only if departure times are within an acceptable delta (e.g., ±10 minutes).
    - Optionally apply weighting: closer times = higher match score.
  - Matching Score Calculation
    - Factors include:
      - Route similarity (overlap% %)
      - Time alignment
      - Past co-travel history (optional)
      - User preferences (e.g., language, gender, privacy)

### 8.1.4 Match Confirmation

- If a suitable match (e.g., User A ↔ User B) is found:
  - Show both parties the estimated cost, co-traveler info (if allowed), and shared trip benefits.
  - Both must accept before finalizing the match.

### 8.1.5 Booking with Driver Provider

- Once matched, Lift books a single ride via Grab API, using one pickup and optimized routing.
- Cost is either split automatically, or one user pays and is reimbursed later.

# 9. Monitoring & Evaluation

## 9.1 KPI & OKRs

**Objective 1 :** Boost User Engagement and Platform Adoption

**Key Results (KRs) :**

- Reach ≥ 30,000 active users within 3 years.
- Achieve ≥ 60% ride matching access rate from total ride requests.
- Maintain ≥ 50% user retention rate within 6 months of first use.

**KPIs :**

- Monthly Active Users
- Ride Matching Success Rate (%)
- 6-Month Retention Rate (%)

**Objective 2 :** Deliver Measurable Environmental and Economic Impact of Urban Mobility

**Key Results (KRs) :**

- Reduce ≥ 300,000 km of single-passenger driving within 3 years.
- Help users save ≥ 30% on commuting costs compared to single-passenger ride-hailing.
- Lower average travel time by ≥ 20% per trip

**KPIs :**

- Distance reduced from single-passenger trips (km)
- Average commute cost savings per user (%)
- Total $CO_2$ emissions reduced (tons)

# 10. Financial Projection & ROI

## 10.1 ROI : 6.5%

| ROI | Benefit Type | Detail | Annual Value (THB) |
|---|---|---|---|
| Hard ROI | Platform Fee | Charge a 10% fee from the travel fare | 18,450,088 |
| | Advertisement | Sell advertising space to related businesses | 1,800,000 |
| | Sell Carbon Credit | Calculated from reduced $CO_2$ (1 ton per 7,000 kilometers) | 86,760 |
| Soft ROI | Reduce Co2 and PM 2.5 | A medium-sized car emits 789 tons of $CO_2$ per year | |

| ROI | Benefit Type | Detail | Annual Value (THB) |
|---|---|---|---|
| | Reduce Traffic Congestion | | |
| | Reduce Transportation Cost | | |

## 10.2 Cost Estimation

### 10.2.1 Development Cost :

Development Application Costs 3,410,000 Baht for one-time

| Details | Price/Manday (Baht) | Total Manday (Day) | Total |
|---|---|---|---|
| UX/UI | 15,000 | 10 | 150,000 |
| Project Management | 18,000 | 30 | 540,000 |
| Solution Architect | 30,000 | 4 | 120,000 |
| Software Engineers | 15,000 | 90 | 1,350,000 |
| QA | 12,000 | 30 | 360,000 |
| Data Engineer | 15,000 | 10 | 150,000 |
| Data Analyst | 12,000 | 20 | 240,000 |
| Penetration Test | 500,000 | - | 500,000 |
| | Net Total | 194 | 3,410,000 |

### 10.2.2 Operation Cost :

Operation Cost for 36 months is 10,080,000 Baht, Monthly Cost is 280,000 Baht

| Details | Price/Month (Baht) | Total Month | Total |
|---|---|---|---|
| HR | 30,000 | 36 | 1,080,000 |
| Accounting & Finance (Outsource) | 30,000 | 36 | 1,080,000 |
| Operation Team | 100,000 | 36 | 3,600,000 |

| Details | Price/Month (Baht) | Total Month | Total |
|---|---|---|---|
| Marketing Team | 100,000 | 36 | 3,600,000 |
| Consultant | 20,000 | 36 | 720,000 |
| | | Net Total | 10,080,000 |

### 10.2.3 Infrastructure and Cloud Cost :

Infrastructure Cost for 36 months is 3,239,775 Baht

| Details | M1 - M6 | M7 - M12 | M13 - M18 | M19 - M36 | Total |
|---|---|---|---|---|---|
| Google Kubernetes Engine | 64,800 | 97,200 | 145,800 | 656,100 | 963,900 |
| Network IP | 21,600 | 32,400 | 48,600 | 218,700 | 321,300 |
| Database | 75,600 | 113,400 | 170,100 | 765,450 | 1,124,550 |
| Athena / Segemaker | 10,800 | 16,200 | 24,300 | 109,350 | 160,650 |
| GoogleMap API | 45,000 | 67,500 | 101,250 | 455,625 | 669,375 |
| Net Total | 217,800 | 326,700 | 490,050 | 2,205,225 | 3,239,775 |

## 11. Risk Mitigation & Issue Management

Risks & Mitigation Strategies

| Risk | Likelihood | Impact | Mitigation Strategy |
|---|---|---|---|
| Safety & Security Concerns | **High** | **High** | Enforce ID verification, introduce an SOS emergency alert system, and allow user ratings. |
| Regulatory & Compliance Issues | **High** | **High** | Ensure full legal compliance with data protection laws. |
| Pricing or Policy Change from Third-Party Ride-Hailing Services | **Medium** | **High** | Establish contingency plans to adapt to pricing or policy changes from service providers quickly. |
| Low User Adoption | **Medium** | **High** | Implement campaigns, referral incentives, and loyalty rewards to |

| Risk | Likelihood | Impact | Mitigation Strategy |
|---|---|---|---|
| | | | encourage adoption. Improve UI/UX for a seamless experience. |
| Dependency on Third-Party Ride-Hailing Services | **High** | **High** | Consider partnering directly with independent taxi providers to diversify service channels and reduce dependency on third-party platforms. |

# 12. Data Monetization

## 12.1. Data-as-a-Service (DaaS)

Offer API access to your location and ride-sharing data.

- Traffic conditions
- Routes efficiency
- User travel pattern

## 12.2. Map-Based Insights and Analytics

Sell custom reports or dashboards showing:

- Peak travel zones and times
- Carbon savings per route
- Demand heatmaps,
- Missed demand areas (where users couldn't get a ride)

## 12.3. Customer-Based Insights and Analytics

Sell custom reports or dashboards showing:

- Sell customer insights to partners such as an advertising agency
- Design personalized offers to customers to increase engagement
- Provide premium access to the dashboard for decision-making

# 13. MVP

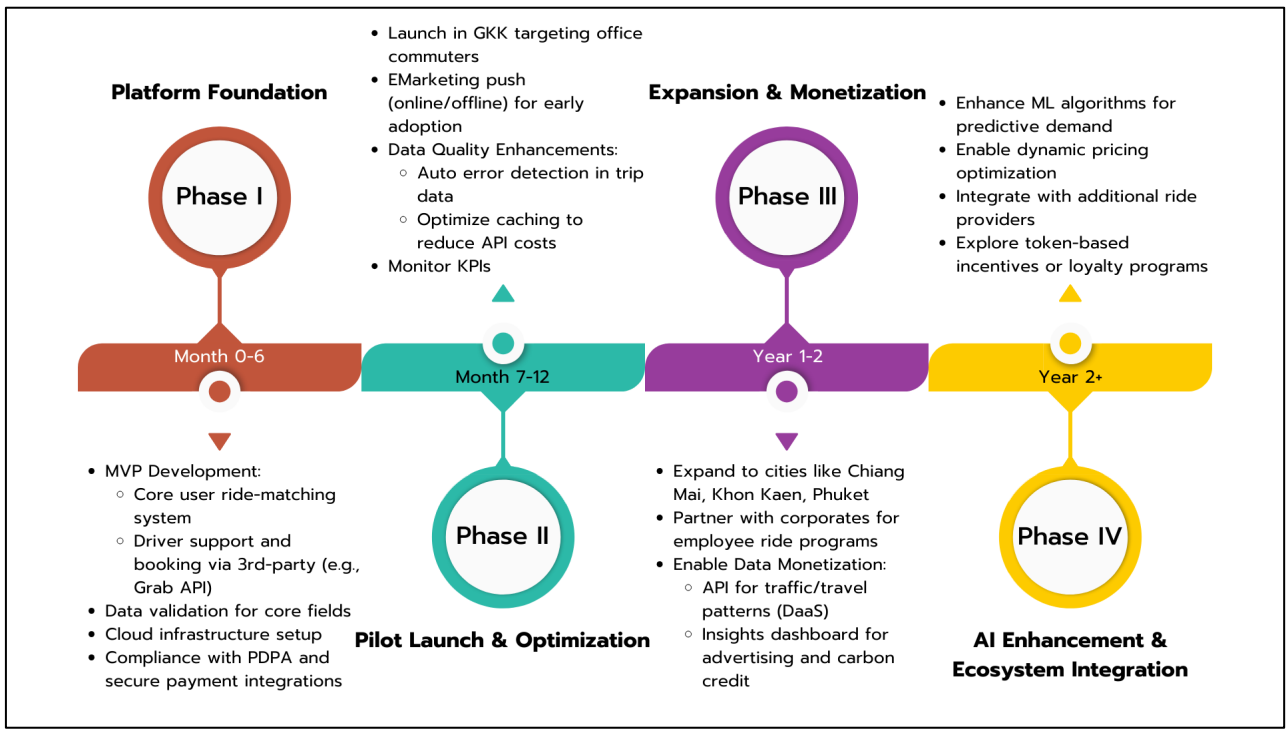
## 13.1 User Matching System

- Match users traveling in the same direction and time window.
- Use GPS to identify pickup and drop-off points.
- Limit the number of passengers per trip.

## 13.2 Driver Support

- Oz wizard to call a grab/taxi to serve the client manually.

## 14. Road Map Development




## 15. Working Team Operation

- CEO - Kittipit Matchakam 6710424029
- CFO - Thotsaphon Sirikutta 6710424031
- COO - Pachinee Jarutanasakgul 6710424030
- Head of Technology - Sarina Borisuit 6710400003
- Head of Marketing - Teerana Seechaipat 6710424026
- Head of Operation - Phuricha Romlee 6710424027