<u>**IDEATION PHASE**</u>

<u>**BRAINSTORMING & IDEA PRIORITIZATION**</u>

Date	16th June 2025
Team ID	LTVIP2025TMID28953
Project Name	CRM Application for Public Transport Management System
Maximum Marks	

Objective:
The ideation phase aimed to uncover inefficiencies in traditional public transportation operations and explore technology-driven solutions to enhance management of trips, employees, fare structures, and bus fleet. This involved problem identification, idea generation, and prioritization based on feasibility and business impact.

Step 1: Team Collaboration & Problem Identification

The team analyzed real-time challenges faced by public transport departments (like RTCs), primarily focusing on operational inefficiencies, manual fare tracking, lack of employee role validation, and error-prone trip planning. Key problem areas included:

- Fare mismanagement due to static or manual fare tracking.

- Assigning invalid drivers/conductors to trips.

- No auto-validation for trip times or passenger capacity.

- Incomplete or inconsistent employee and bus data.

Selected Problem Statement:
"Public transport systems lack an integrated digital solution to manage buses, routes, employees, trips, and fare structures efficiently, leading to errors, miscommunication, and operational delays."

Step 2: Brainstorming & Idea Grouping

Raw Ideas Collected:

- Validate trip passenger count against bus capacity

- Validate if selected employee is a driver or conductor

- Auto-fetch ticket fare based on route and bus model

- Validate phone number formatting

- Validate registration number format of buses

- Trigger alerts if departure and arrival times are equal

- Generate employee-wise and trip-wise reports

- Create dashboards for admin view of trips, drivers, conductors, fares

Grouped Ideas:

1. **Data Validation:**
   - Ensure phone number format correctness
   - Check registration number pattern
   - Ensure trip has valid departure and arrival times

2. **Employee Role Validation:**
   - Verify selected employee role (driver/conductor)
   - Restrict employee allocation to managed bus stations only

3. **Fare Automation:**
   - Auto-fetch ticket fare based on route and bus model using Flow
   - Custom error messaging for missing combinations

4. **Capacity & Trip Accuracy:**
   - Limit passenger count to match bus model capacity
   - Track bus and route combinations for correct fare mapping

5. **Reports and Dashboards:**
   - Trips per month
   - Drivers/Conductors by Bus Station
   - Dashboard visualizing key trip and staff data

Step 3: Idea Prioritization

Idea	Impact	Feasibility	Priority
Validate employee role	High	High	High
Auto-fetch ticket fare	High	Medium	High
Fare error handling via flow	Medium	High	Medium
Validate passenger count	High	Medium	High
Create summary reports	Medium	High	Medium
Validate bus registration	Medium	High	Medium

Final Shortlisted Ideas with Explanation:

1. Apex Trigger to Validate Employee Role

Ensures only correct employees (drivers/conductors) are assigned to trips:

- Validates role via employee record lookup

- Adds error on Trip record if mismatched

- Prevents operational errors and ensures rule-based assignment

Benefit: Prevents misassignment, reduces trip delays due to incorrect staff, ensures compliance.

2. Flow to Fetch Fare Based on Route and Bus Model

A record-triggered flow auto-populates fare by looking up route and bus type from the Ticket Fare object:

- Uses Decision element to verify fare exists

- Updates Trip record or shows custom error

Benefit: Eliminates manual fare input, improves billing accuracy, provides real-time fare automation

3. Validation Rule: Passenger Count vs Capacity

Checks that total passengers in a trip do not exceed bus capacity based on model:

- Supports Super Deluxe, Semi Sleeper, Sleeper models

- Validates against bus capacity field

Benefit: Avoids overbooking, ensures accurate seat assignment, enhances passenger experience

4. Validation Rules for Data Accuracy

Includes:

- Phone number format validation

- Bus registration pattern validation

- Departure and arrival time mismatch check

Benefit: Improves data hygiene, reduces manual correction efforts, ensures valid data entry

5. Custom Reports and Dashboards

Generated reports:

- Employees grouped by Bus Station

- Drivers and Conductors Info

- Trips for current/previous months

Dashboard:

- Graphical view of staff data, trip stats, and revenue insights

Benefit: Enables real-time tracking, performance monitoring, and decision-making for transport admins

EMPATHY MAP CANVAS

Who Are We Empathizing With?

- **Transport Administrators** – Responsible for overall route planning, trip scheduling, and staff assignment.

- **Drivers & Conductors** – Field staff executing the trip, dependent on clear assignments and timely information.

- **Ticketing Operators** – Need accurate fare data to issue tickets.

User Says

- "We often assign the wrong driver or conductor."

- "I wish the fare was calculated automatically based on route."

Implication:

- Need strict validation and automation

- Users expect error-free, intelligent suggestions

User Thinks

- "What if we accidentally book more passengers than allowed?"

- "This could be simpler with automation."

Implication:

- Worry about system errors and manual burden

- Open to tech solutions to reduce human error

User Does

- Manually checks bus capacity

- Refers printed lists to confirm fare amounts

Implication:

- Indicates inefficient and outdated practices

- Painful data retrieval, delay in response

User Feels

- Frustrated with manual tracking

- Relieved when data auto-fills correctly

Implication:

- Automation enhances user trust

- Reduces stress and improves adoption

Key Insights:

1. **Need for Employee Role Validation**
   Without role-based assignment checks, trips risk being manned by unauthorized personnel, impacting service.

2. **Fare Lookup Automation is Crucial**
   Staff manually match fares with routes and models, which is time-consuming and error-prone. Auto-fetching fares directly enhances speed and accuracy.

3. **Data Validation Protects Process Integrity**
   Format mismatches or incorrect data (e.g., phone number, registration) result in tracking delays. Validation rules help maintain high-quality CRM data.

4. **Visual Dashboards Enhance Admin Oversight**
   Admins need live access to trips, staff, and route performance. Dashboards give real-time analytics to manage efficiently.

5. **Empowering Staff through Simplified Workflows**
   Frontline workers feel more confident and effective when their systems guide them with logic checks and auto-filled data.

Problem Statement 1: Role Validation Gaps Lead to Trip Disruptions

We believe that transport operators and trip planners are struggling to assign the correct drivers and conductors because of the lack of real-time role validation and dependency on manual selection. This causes trip delays, re-assignments, and passenger dissatisfaction.

Problem Statement 2: Manual Fare Mapping Causes Billing Errors

We believe that ticketing agents and admins are struggling with accurately determining trip fares because fare data is stored in external sheets or memory, not integrated with the CRM. This causes fare mischarges, refund requests, and inefficiency in the booking process.

Problem Statement 3: Inconsistent Data Entry Hampers System Reliability

We believe that employees are struggling to maintain standardized records because of the absence of validation rules and data automation, leading to dirty data, errors in reporting, and reduced operational trust in the system.

Problem Statement 4: Lack of Insights on Trips and Staff Limits Decision-Making

We believe that transport administrators are struggling to get real-time data views on trip statistics and staff deployment because of the lack of consolidated dashboards and summary reports. This results in delayed response to issues and sub-optimal resource allocation.