Title:

A CRM Application for
Public Transport Management System

College: Seshadri Rao Gudlavalleru Engineering College

Team Details:

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User Story:

The Public Transport(RTC - Regional Transport corporation) Management System is a comprehensive Salesforce application designed to streamline and manage various operational aspects of the Public Transport.   This system will enable the Transport department to efficiently maintain details of employees, their roles, bus stations, buses, ticket fares, daily bus trips, passenger counts, and the total ticket fare amount. By leveraging Salesforce's robust platform, the Transport Department can improve operational efficiency, data accuracy, and reporting capabilities.

1. INTRODUCTION

1.1 Project Overview:

This project is to Consolidate all Transport-related data into a single Salesforce application to ensure easy access, management, and reporting. Enable real-time insights and reports on various operational metrics such as passenger count and revenue. Maintain detailed records of all Transport employees, including personal details, contact information. Define and assign roles and responsibilities to each employee. Schedule and manage employee shifts, especially for drivers and conductors. Maintain information on all bus stations, including location, facilities. Maintain detailed records of all buses, including model, capacity. Manage bus schedules and assign buses to specific routes and trips. Define and manage ticket fares for different routes and bus types. Track daily trips for each bus, including start and end times, routes, and driver details. Record the number of passengers on each trip. Calculate and track the total ticket fare amount collected from each trip. Provide real-time dashboards for quick insights into key metrics such as passenger count, trip efficiency, and revenue.

1.2 Purpose:

The primary objective of this project is to design and implement a scalable, efficient, and user-friendly Salesforce-based CRM application for managing public transport services. The system offers:

- A simplified interface to handle bus bookings and route assignments
- Automation of trip scheduling, bus-driver allocation, and passenger notifications
- Prevention of double bookings or conflicting schedules through validation logic.
- Real-time visibility into bookings, schedules, and trip statuses
- Reporting and dashboard features for operational tracking and decision-making

2. IDEATION PHASE

2.1 Problem Statement

Public transport providers face several operational challenges, such as:

- Lack of a centralized platform to manage passenger data, bus schedules, and routes
- Manual coordination between station staff and drivers leading to delays and inefficiencies
- Duplicate or overlapping bookings due to the absence of automated validation
- No real-time visibility into bookings, seat availability, or trip statuses
- Inability to generate timely reports for management and service optimization.

2.2 Empathy Map Canvas

Customer Persona: Daily Commuter / Intercity Passenger

- **Says:** "I want a reliable bus and on-time service."
- **Thinks:** "Will my booking be confirmed and the trip be on schedule?"
- **Does:** Checks with the station or online, waits for bus updates, and calls for confirmation
- **Feels:** Frustrated with delays and confused about schedules

Goals:

- Hassle-free online or counter-based ticket booking
- Real-time updates on bus timings and seat availability
- Clear route and fare details with booking confirmation

Challenges:

- Uncertainty due to last-minute schedule changes
- Long wait times or booking errors
- No clear channel for service feedback or communication

2.3 Brainstorming

- Following team discussions and analysis of existing transport challenges, the following solution components were identified:
- A centralized Salesforce CRM to manage all transport operations (buses, routes, bookings, passengers)
- Automated Flows to handle ticket booking confirmations, driver assignments, and notifications
- Validation Rules to prevent schedule conflicts or overbooking
- Custom Reports and Dashboards to visualize booking trends, bus utilization, and route performance.

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

The customer journey in the banquet hall management system follows these key stages:

- **Inquiry:** Customers contact the business through phone or website to inquire about availability and services.
- **Quotation & Confirmation:** A quotation is provided, and once approved, the booking details are entered into the CRM system.
- **Service Allocation:** Relevant services such as catering or decoration are scheduled and assigned to vendors or staff.
- **Event Execution:** The event is carried out with coordination between staff and service providers.
- **Post-Event:** Customer feedback is collected and stored for future reference.

Identified Pain Points:

- **Booking clashes** due to a lack of centralized scheduling.
- **Manual service assignment**, leading to delays and inefficiencies.
- **No structured system** for tracking service delivery or feedback.

3.2 Solution Requirements

- **Salesforce Developer Org** for building and testing the application.

Custom Objects:

- Trip__c: Stores details of each trip including source, destination, date, time, and assigned bus.
- Ticket_Fare__c: Captures fare-related information such as fare amount, ticket class, route, and associated trip.

Standard Objects:

- Account: Represents customer organizations.
- Contact: Stores individual customer information.

Automation:

- **Flows** for tasks like service scheduling and feedback collection.
- **Apex Triggers** for custom logic, such as preventing overlapping bookings.
- **Validation Rules** to maintain data integrity (e.g., ensuring valid contact info and preventing past dates).
- **Reports and Dashboards** to monitor performance metrics such as bookings per month and customer feedback.

3.3 Data Flow Diagram

3.4 Technology Stack

Component	Technology Used
Platform	Salesforce Developer Org
Backend Logic	Apex Triggers, Flows
Data Management	Custom & Standard Objects
User Interface	Salesforce Lightning (Lightning App Builder)
Reporting	Dashboards & Reports
Automation	Process Builder, Flow

4. PROJECT DESIGN

4.1 Problem–Solution Fit

The existing market for banquet hall and event booking management often relies on manual methods such as spreadsheets, phone calls, or registers. These traditional methods lead to inefficiencies like double bookings, poor coordination, and lack of service tracking.

The proposed CRM-based solution addresses this gap by introducing:

- **Centralized data management** for real-time access and update.
- **Automated workflows** to reduce manual dependency
- **Role-based access** to improve staff coordination
- **Streamlined operations** that enhance customer satisfaction and business efficiency.

4.2 Proposed Solution

The project delivers a customized Salesforce application that:

- Enables users to **create and manage event bookings** through an intuitive UI
- Utilizes **Flow logic** to automatically assign services such as catering, decoration, or security
- Offers **interactive dashboards and reports** to track event progress and service performance
- Implements **validation rules and Apex triggers** to ensure accurate and consistent data entry.

4.3 Solution Architecture

The architecture is organized into three key layers:

- **Presentation Layer**:
  Built using **Salesforce Lightning Experience**, offering responsive and user-friendly interfaces for event managers and staff.
- **Logic Layer**:
  Implemented using **Apex Triggers**, **Flows**, and **Validation Rules** to handle business processes like service assignment, booking verification, and feedback capture.
- **Data Layer**:
  Comprises **Custom Objects** (e.g.Ticket_Fare__c ,Trip__c) and **Standard Objects** (Account, Contact) for structured storage, along with Salesforce metadata for configuration.

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Milestones with relevant screenshots provided:

I. Salesforce Account Setup:

Activity 1: Creating Developer Account

Creating a developer org in salesforce.
1. Go to https://developer.salesforce.com/signup
2. On the sign up form, enter the following details :

1. First name & Last name
2. Email
3. Role : Developer
4. Company : College Name
5. Country : India
6. Postal Code : pin code
7. Username : should be a combination of your name and company.

This need not be an actual email id, you can give anything in the
format : username@organization.com
Click on sign me up after filling these.

Activity 2: Account Activation:
1. Go to the inbox of the email that you used while signing up. Click on the verify account to activate your account. The email may take 5-10mins.

2. Click on Verify Account

3. Give a password and answer a security question and click on change password.

4. Then you will redirect to your salesforce setup page.

2. Object Creation:

i. Employee

ii. Bus

iii. Bus Station

iv. Ticket Fare

v. Trip

5. Lightning App Configuration

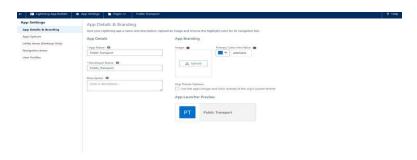## 5.1 Lightning App for Public Transport Management

To streamline operations such as trip scheduling, fare management, bus and staff tracking, a custom **Lightning App** titled **Public Transport** was created within Salesforce. This app consolidates all key modules into one interface for administrative efficiency.

Steps to Create the App:

1. **Access App Manager**
   In **Setup**, search for and select **App Manager**.

Create New Lightning App

2. Click **New Lightning App** and enter the **App Name** as: Public Transport

3. **App Options**
   Leave default options selected and proceed by clicking **Next**.
4. **Utility Items**
   No changes made; click **Next** to continue.
5. **Navigation Items**
   From the **Available Items** list, move the following into **Selected Items**:

- **Bus Stations**
- **Buses**
- **Trips**
- **Ticket Fares**
- **Employees**

6. **Assign Profiles**
Move **System Administrator** to the **Selected Profiles** section to allow access.

6. **Save the App**
Click **Save & Finish** to complete the app creation.

5. Fields:
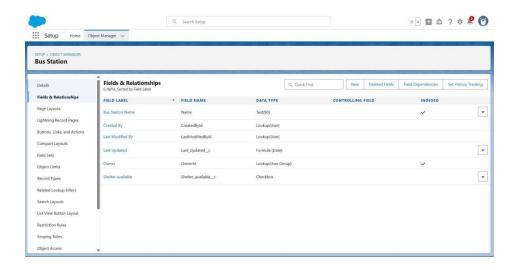
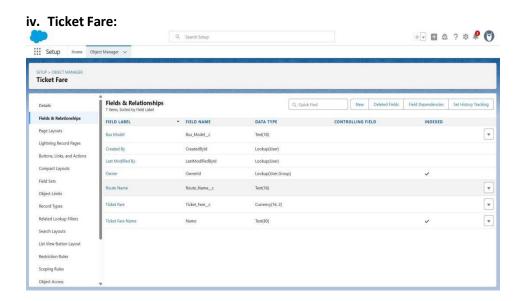Create respective fields for the objects
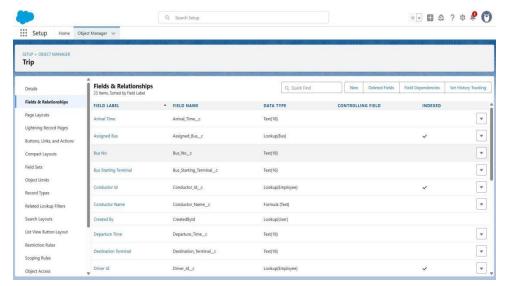
i. **Employee:**

ii. **Bus:**

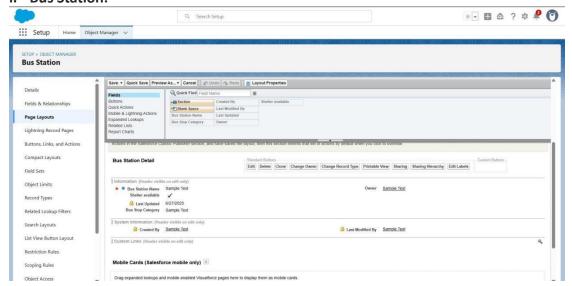### iii. Bus Station:
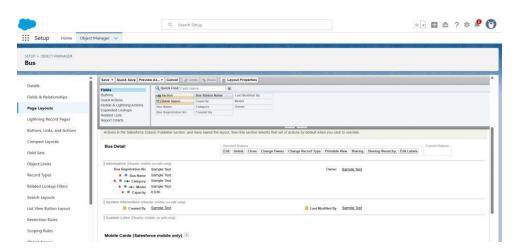

iv. Ticket Fare:

v. Trip:

6. Creation of Page Layouts:

I. Bus Station:
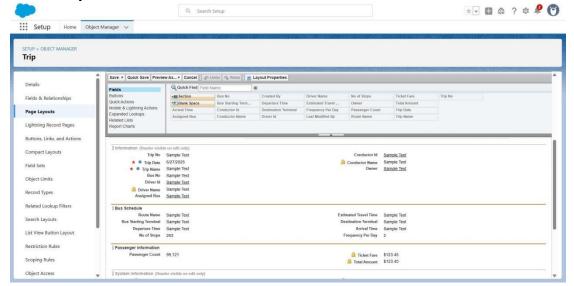

II. Bus :

III. Employee:

IV.   Trip:

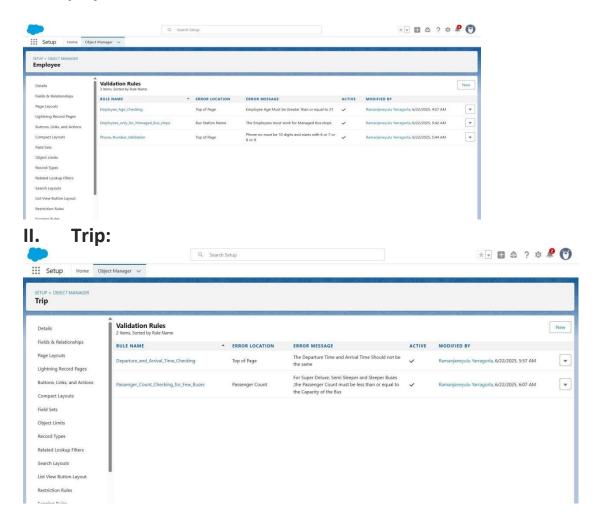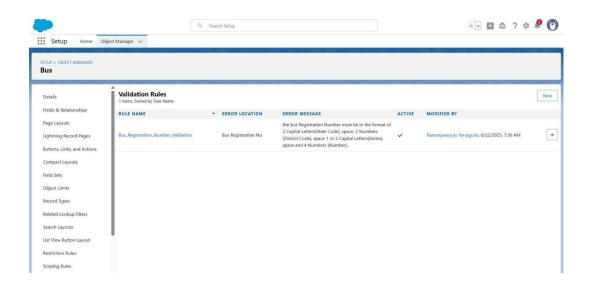
V. Ticket Fare:

7. Validation Rules:

I. Employee:
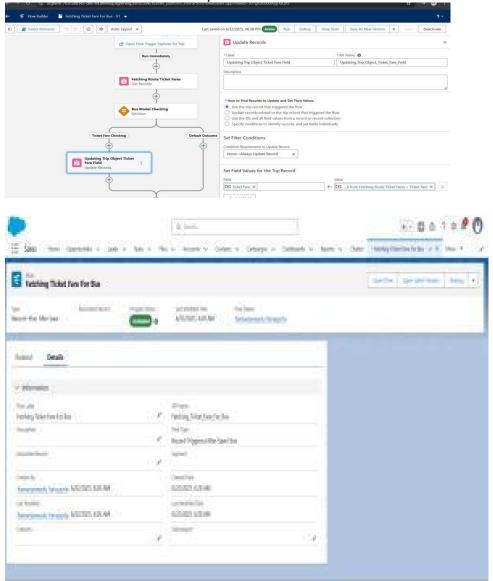

II. Trip:

III. Bus:

8. Flows:

Flows are declarative, drag-and-drop tools that allow administrators to create guided experiences for users, automate complex business processes, and integrate with other Salesforce features and external systems.
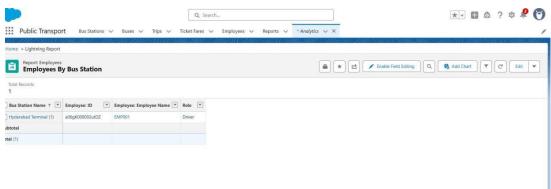

9. Triggers:

Triggers in Salesforce are pieces of Apex code that execute before or after specific database operations, such as insert, update, delete, or undelete. They allow you to perform custom actions on records in Salesforce when certain events occur. Triggers are particularly powerful for enforcing business logic and automating workflows.

10.   Reports:
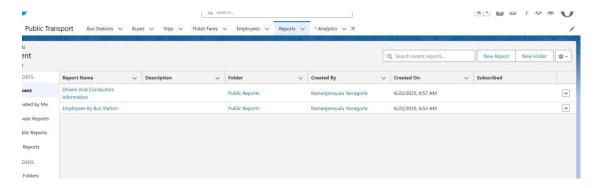
Reports in Salesforce are tools that allow you to analyze and present your Salesforce data in a structured format. They help you understand and monitor key metrics and trends, providing insights into your business operations. Salesforce reports are highly customizable and can be tailored to meet specific business requirements.

1.   **Create a Employees By Bus Station(Summary) Report**

2. Create a Drivers and Conductors Information Report

3. Create a Previous and Current Month Trip Details Report

11.   Dashboards

Dashboards in Salesforce are visual representations of your reports and key metrics, providing a consolidated view of your data. They allow you to monitor performance, track progress, and make informed decisions at a glance. Dashboards are composed of various components such as charts, tables, gauges, and metrics, each displaying data from one or more reports.

12. Conclusion:

By implementing this Salesforce-based Public Transport(RTC) Management System, the RTC department can significantly improve its operational efficiency, data management, and overall service quality to passengers. Data-driven decision-making capabilities for management. Accurate and up-to-date records of all operational data.

6. FUNCTIONAL AND PERFORMANCE TESTING

The application was manually tested by the developer through various real-life transport booking scenarios to ensure accurate functionality, data integrity, and system responsiveness.

Functional Testing:

Trip Creation, Editing, and Cancellation workflows validated

Ticket Fare assignments automated using Flows

Record-type-based page layout rendering verified for different object types

Lookup relationships between Contact and Trip objects confirmed

Validation rules for trip dates, fare entries, and bus capacity tested

Performance Testing:

Conducted using **30+ test records** for trips, buses, fares, and staff

Dashboards displayed metrics **accurately and with low latency**

No duplicate entries, errors, or crashes during manual stress testing

Automation Flows triggered in real-time under typical data loads

7. RESULTS

The final Salesforce application for the Public Transport Management System successfully achieves the following outcomes:

- **End-to-end trip scheduling and ticket fare management**
- **Automated bus and staff assignment using Flow logic**
- **Real-time monitoring** through dashboards and reports
- **High data integrity** ensured via validation rules and relationships

8. ADVANTAGES & DISADVANTAGES

Advantages:

- **Cloud-based access** enables usage from any location
- **Automated workflows** reduce manual efforts and errors
- **Accurate validations** ensure consistency and reliability
- **Real-time visual dashboards** support better operational decision-making

Disadvantages:

- **Learning curve** for new users unfamiliar with Salesforce
- **Requires stable internet connectivity** for access and operation
- **Limited flexibility** outside the Salesforce ecosystem unless integrated with external tools

9.FUTURE SCOPE

To enhance the application and align it further with real-world needs, the following improvements are proposed:

- **Online payment gateway integration** for full-cycle ticketing
- **Mobile app interface** using Salesforce Mobile Publisher or LWC
- **Customer feedback system** via custom objects and surveys
- **SMS/Email notifications** using Salesforce APIs or Marketing Cloud
- **Event calendar integration** to manage bus schedules and staff shifts

10.APPENDIX

- **Source Code / Configuration:** Implemented within the Salesforce Developer Org
- **Dataset:** Dummy records for trips, ticket fares, buses, and staff were used during testing
- **Demo Video Link:**
  https://drive.google.com/file/d/1FFjTpNr4lsWVGdq3EN9uwOjr pFOB1YzI/view?usp=sharing