

Vehicle Management System

Report submitted to



Bachelor of Technology
in
Computer Science Engineering

Submitted by
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1. INTRODUCTION

1.1 OVERVIEW

The inspiration for our idea is Salesforce, a renowned cloud-based platform renowned for its superior customer relationship management (CRM) features. A dependable car management system built within the Salesforce ecosystem is what we're aiming to build. This system is made to efficiently manage and keep an eye on drivers, passengers, and the cars they are in.

With the extensive feature set provided by Salesforce, our goal is to maximize resource allocation, increase operational efficiency, and provide a smooth experience to all parties engaged in the transportation process. Our solution takes advantage of Salesforce's powerful functions to improve vehicle assignments, monitor maintenance schedules, assess driver performance, and improve communication between passengers and drivers.

Our ground-breaking vehicle management solution aims to revolutionize transportation operations through the use of Salesforce's capabilities. more production, decreased expenses, and more customer happiness are the end results of this transition.

1.2 PURPOSE

The Vehicle Management System project's goal is to create a centralised platform that enables travel firms to efficiently manage vehicle operations, driver assignments, and passenger reservations. This initiative's main goal is to automate and simplify a variety of processes so that agencies may increase operational effectiveness and better allocate resources. The initiative aims to promote enhanced coordination and communication between agencies and drivers by providing real-time access to car availability, driver assignments, and passenger reservations. The technology also makes it easier to track scheduled maintenance for vehicles, ensuring the fleet of the agency is reliable and safe. In the end, this initiative hopes to streamline vehicle management, develop improved teamwork, and provide passengers with a streamlined booking experience, leading to higher productivity, cost savings, and improved customer happiness.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

The current issue with vehicle management systems is the lack of a centralised and effective platform for choosing and reserving vehicles, which creates complications and insufficient communication channels for consumers. The client experience is hampered by manual procedures, out-of-date data, and limited accessibility. Furthermore, fleet management and coordination are hampered by the lack of reliable vehicle tracking and driver management technologies. An additional annoyance is the absence of an online booking system, which necessitates human effort and lacks real-time updates. By addressing these issues with a centralised platform, cutting-edge tracking tools, and an online booking system, we can increase operational effectiveness, boost communication, and optimise the entire experience for clients and agencies.

2.2 PROPOSED SOLUTION

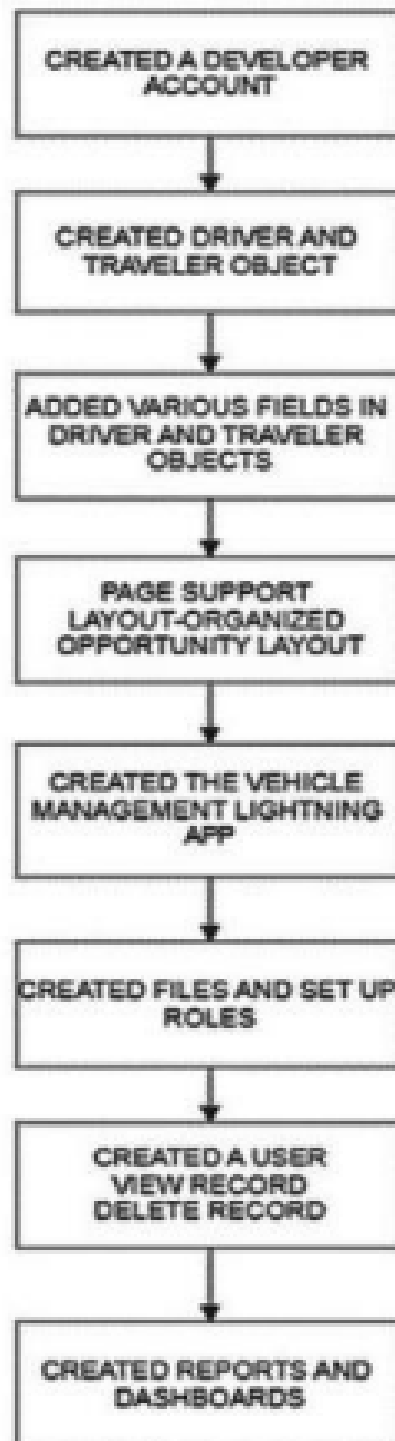
The proposed solution for the Vehicle Management System (VMS) using Salesforce combines the key components from both answers. The VMS leverages Salesforce's capabilities to address existing problems and enhance the vehicle management process through the following points:

1. **Centralized Customer Database:** Integrate with Salesforce to establish a centralized customer database, storing customer details, preferences, and travel history for personalized offers and improved communication.
2. **Real-time Vehicle Availability:** Provide up-to-date information about vehicle availability, pricing, and specifications through integration with Salesforce, ensuring customers have access to accurate and current data when selecting their desired vehicle.
3. **Personalized Offers and Updates:** Utilize Salesforce's capabilities to utilize stored customer data and provide personalized offers, seasonal discounts, and relevant updates, enhancing the overall customer experience.
4. **Efficient Communication Channels:** Utilize Salesforce's messaging and email capabilities to establish efficient communication channels, sending timely notifications to customers regarding their booking status, vehicle availability, and any changes related to their reservation.
5. **Vehicle Database:** Develop a centralized database within Salesforce to store information about vehicles, including vehicle details, availability, and maintenance history.
6. **Driver Management:** Create a driver management module that allows agencies to maintain a pool of drivers, including their contact information, licensing details, and availability.
7. **Real-time Booking System:** Implement a real-time booking system that enables travelers to book vehicles directly through a user-friendly interface, specifying trip details, vehicle preferences, and pickup/drop-off locations.
8. **Vehicle Allocation and Scheduling:** Develop an algorithm or rule-based system to automate vehicle allocation to drivers based on availability, proximity, traveler preferences, driver ratings, and vehicle capacity.
9. **Maintenance and Service Management:** Implement a module for scheduling and tracking vehicle maintenance tasks, including inspections, repairs, and regular servicing, with automated reminders for upcoming maintenance activities.
10. **Reporting and Analytics:** Develop reporting and analytics capabilities to generate insights on key metrics such as vehicle utilization, driver performance, and customer feedback, enabling data-driven decisions and identifying areas for improvement.

By implementing this comprehensive solution, organizations can overcome existing problems in vehicle management systems. The VMS streamlines vehicle selection, improves customer satisfaction through personalized offers and updates, and establishes effective communication channels. Additionally, it includes features for driver management, real-time booking, vehicle allocation and scheduling, maintenance and service management, reporting, and analytics, enhancing the overall efficiency of vehicle management operations.

3. THEORETICAL ANALYSIS

3.1 BLOCK DIAGRAM



3.2 Hardware / Software designing

Hardware:

- Processor: A modern dual-core processor, such as an Intel Core i3 or equivalent.
- Memory (RAM): 4 GB or more of RAM is required.
- Storage: 10 GB or more of free hard disc space is required.
- Display: A screen with a resolution of at least 1024x768 pixels.
- Internet connectivity: A consistent, dependable connection to the internet with a minimum network speed of 10 Mbps.
- Mobile devices: Optional - 2 mobile devices for testing purposes.

Software:

- Valid Salesforce account and subscription required for the Salesforce platform.
- Web browsers: The most recent iterations of browsers that are compatible, such as Chrome, Firefox, or Edge.
- One database management system, such as Oracle or MySQL, is optionally used for integrating external data.
- Integrated Development Environment (IDE): A single IDE, such as Salesforce Developer Console or Visual Studio Code with Salesforce Extensions, for developing Salesforce applications.

4. EXPERIMENTAL INVESTIGATIONS

During the development and implementation of the Vehicle Management System (VMS), several experimental investigations were conducted to analyse and validate the effectiveness of the solution. The investigations focused on different aspects of the system, including user experience, data accuracy, efficiency, and customer satisfaction. Here are some of the key areas that were explored:

- User Interface and Experience:

One of the primary considerations in the VMS was to ensure a user-friendly interface that would enable customers to easily navigate through the system and book vehicles. Experimental investigations involved conducting usability tests and collecting feedback from users to assess the intuitiveness and efficiency of the user interface. Iterative improvements were made based on the findings to enhance the overall user experience.

- Data Accuracy and Availability:

To evaluate the accuracy and availability of data within the VMS, extensive testing was conducted. The investigations involved scenarios such as updating vehicle availability in real-time, verifying the correctness of pricing information, and ensuring that the system provides accurate and up-to-date vehicle specifications. These experiments aimed to validate the system's ability to deliver reliable and consistent data to customers.

- Performance and Efficiency:

The performance and efficiency of the VMS were analyzed through experiments to ensure optimal system responsiveness and minimal processing delays. Load testing was performed to simulate high concurrent user traffic and assess the system's performance under such conditions. The investigations focused on identifying and resolving any bottlenecks or performance issues to ensure a smooth and efficient user experience.

- Booking Trends:

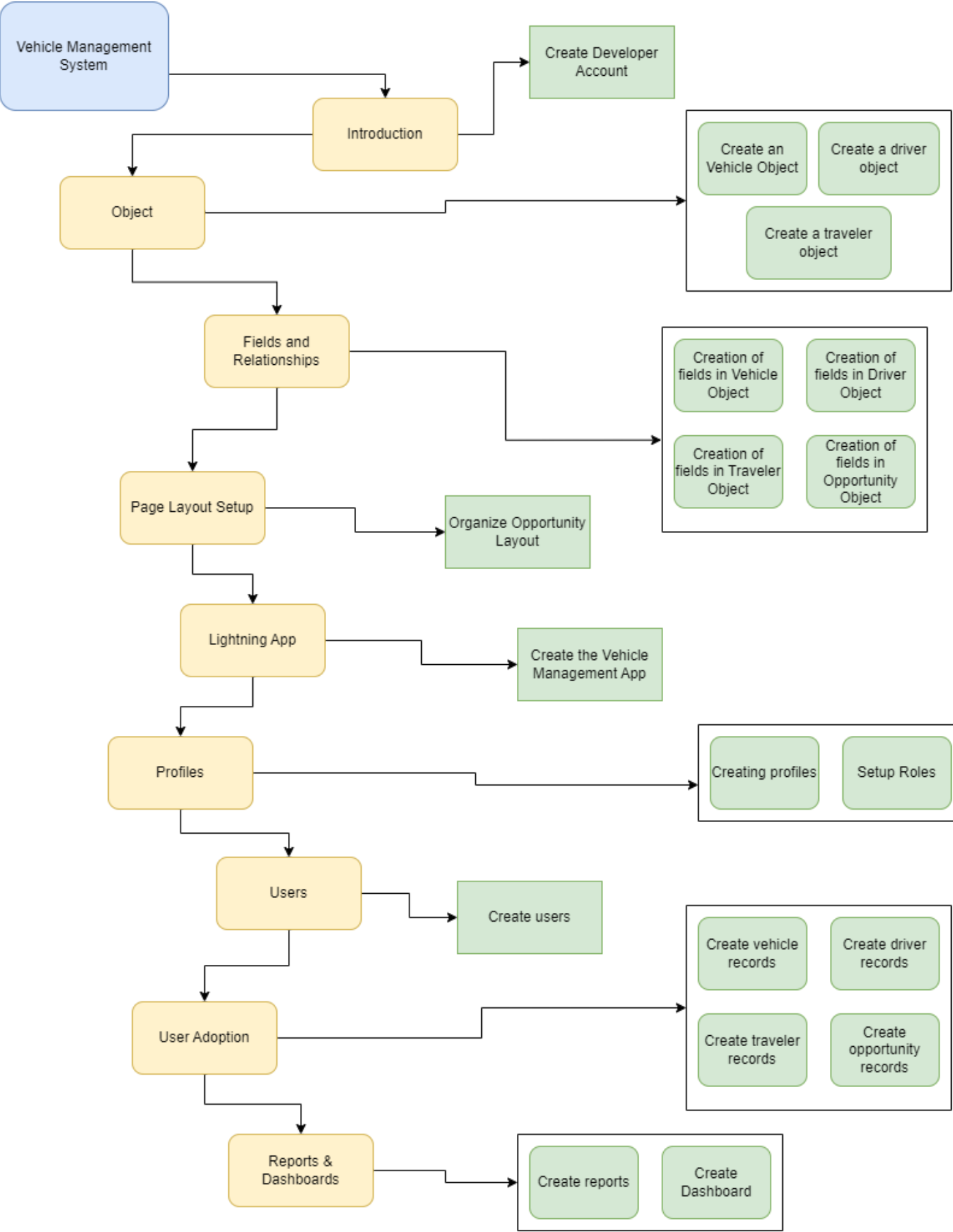
Analyze booking data to identify popular routes, peak booking times, and any seasonal trends. This analysis can assist in resource planning, ensuring the availability of vehicles and drivers during high-demand periods.

- Customer Satisfaction Evaluation:

Gather feedback from travelers to assess their satisfaction with the booking and travel experience. Look for common themes or issues raised by customers and address them to improve overall customer satisfaction.

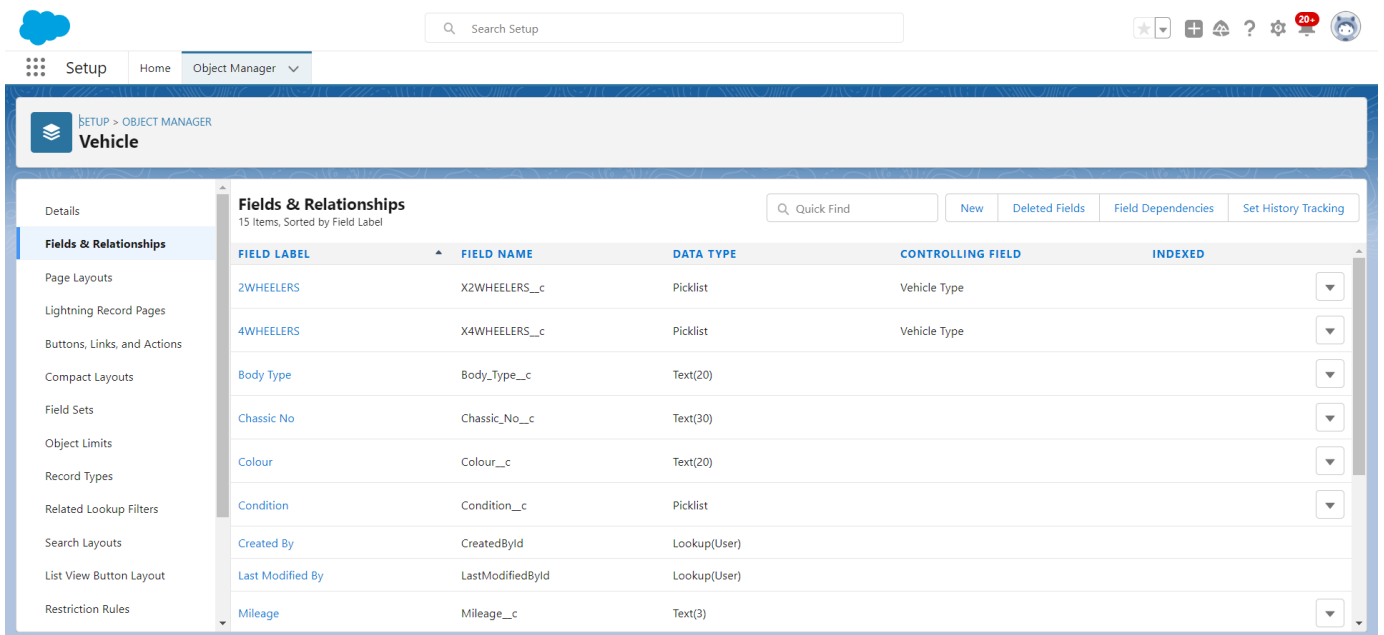
- Maintenance Analysis: Monitor maintenance records and analyze data related to vehicle breakdowns, repairs, and associated costs. Identify recurring issues or patterns that may require attention and implement preventive measures to minimize downtime and repair expenses.

5. FLOWCHART



6. RESULT

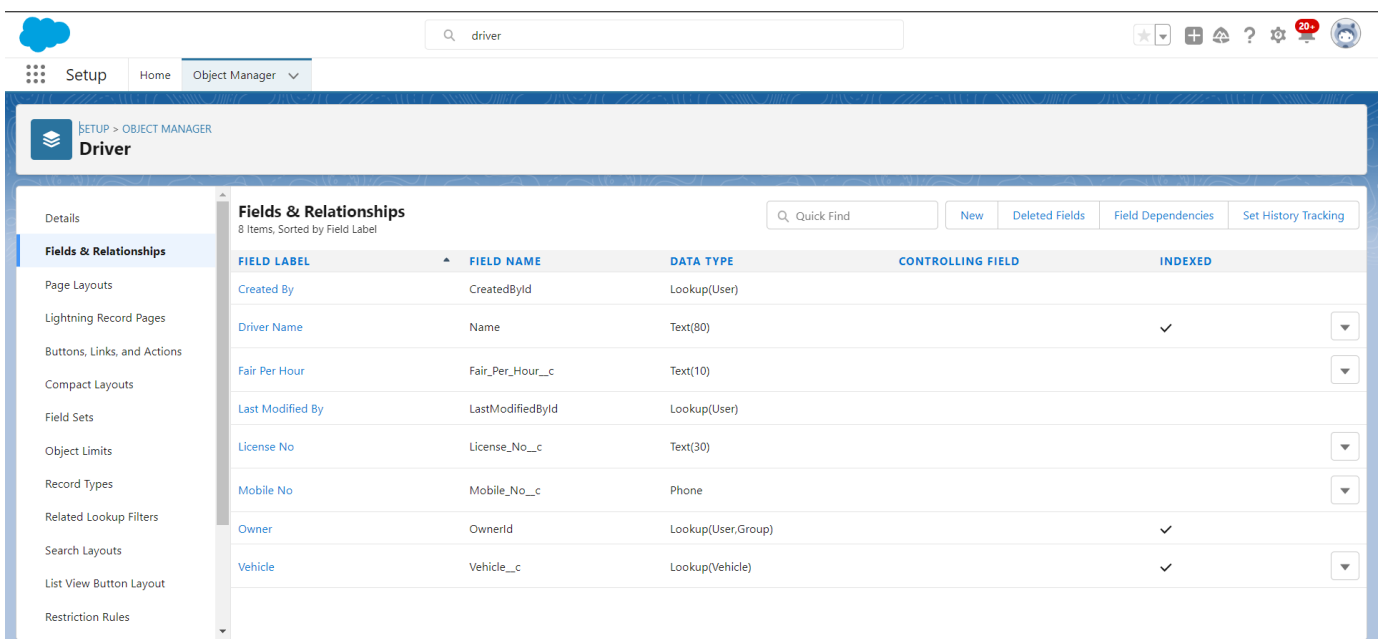
Custom Object – Vehicle and it's custom fields



The screenshot shows the Salesforce Setup interface for the 'Vehicle' custom object. The 'Fields & Relationships' tab is selected, displaying a list of 15 fields sorted by label. The fields include picklists for wheels, body type, chassis, and condition, as well as text fields for color, mileage, and lookup fields for created/modified by.

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
2WHEELERS	X2WHEELERS__c	Picklist	Vehicle Type	
4WHEELERS	X4WHEELERS__c	Picklist	Vehicle Type	
Body Type	Body_Type__c	Text(20)		
Chassic No	Chassic_No__c	Text(30)		
Colour	Colour__c	Text(20)		
Condition	Condition__c	Picklist		
Created By	CreatedById	Lookup(User)		
Last Modified By	LastModifiedById	Lookup(User)		
Mileage	Mileage__c	Text(3)		

Custom Object – Driver and it's custom fields



The screenshot shows the Salesforce Setup interface for the 'Driver' custom object. The 'Fields & Relationships' tab is selected, displaying a list of 8 fields sorted by label. The fields include lookup fields for created/modified by and owner, and text fields for driver name, license, and mobile number.

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Created By	CreatedById	Lookup(User)		
Driver Name	Name	Text(80)		✓
Fair Per Hour	Fair_Per_Hour__c	Text(10)		
Last Modified By	LastModifiedById	Lookup(User)		
License No	License_No__c	Text(30)		
Mobile No	Mobile_No__c	Phone		
Owner	OwnerId	Lookup(User,Group)		✓
Vehicle	Vehicle__c	Lookup(Vehicle)		✓

Custom Object – Traveler and it’s custom fields

Setup

Home

Object Manager

Search Setup

20

SETUP > OBJECT MANAGER

Traveler

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Field Sets

Object Limits

Record Types

Related Lookup Filters

Search Layouts

List View Button Layout

Restriction Rules

Fields & Relationships

6 Items, Sorted by Field Label

Quick Find

New

Deleted Fields

Field Dependencies

Set History Tracking

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Created By	CreatedById	Lookup(User)		
Last Modified By	LastModifiedById	Lookup(User)		
Owner	OwnerId	Lookup(User,Group)		✓
Traveler Contact No	Traveler_Contact_No__c	Phone		
Traveler Email	Traveler_Email__c	Email		
Traveler Name	Name	Text(80)		✓

Standard Object – Opportunity and it’s custom fields

Setup

Home

Object Manager

Search Setup

20

SETUP > OBJECT MANAGER

Opportunity

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Field Sets

Object Limits

Record Types

Related Lookup Filters

Search Layouts

List View Button Layout

Scoping Rules

Fields & Relationships

31 Items, Sorted by Field Label

Quick Find

New

Deleted Fields

Field Dependencies

Set History Tracking

Primary Campaign Source	CampaignId	Lookup(Campaign)		✓
Private	IsPrivate	Checkbox		
Probability (%)	Probability	Percent(3, 0)		
Quantity	TotalOpportunityQuantity	Number(16, 2)		
Route	Route__c	Long Text Area(32768)		
Stage	StageName	Picklist		
Total Fair	Total_Fair__c	Currency(8, 0)		
Tracking Number	TrackingNumber__c	Text(12)		
Type	Type	Picklist		
Vehicle	Vehicle__c	Lookup(Vehicle)		✓

Add Users –

Setup

Home

Object Manager

Search Setup

Users

Permission Set Groups

Permission Sets

Profiles

Public Groups

Queues

Roles

User Management Settings

Users

Feature Settings

Data.com

Prospector Users

Didn't find what you're looking for?

Try using Global Search.

SETUP

Users

All Users

Help for this Page

On this page you can create, view, and manage users.

In addition, download SalesforceA to view and edit user details, reset passwords, and perform other administrative tasks from your mobile devices: [iOS](#) | [Android](#)

View: All Users

Edit | Create New View

New User

Reset Password(s)

Add Multiple Users

A

B

C

D

E

F

G

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Other

All

Action	Full Name	Alias	Username	Role	Active	Profile
<input type="checkbox"/> Edit	Awad, Younes	yawad	yawad.81ng7w ubxd.5pgk1ebizzou.x27z6(ccwasc.glk4nhk7 tuw @project.vit		<input checked="" type="checkbox"/>	Cross Org Data Proxy User
<input type="checkbox"/> Edit	Chatter Expert	Chatter	chattv.00d21000000fsaoea2.crnhoptantup@chatter.salesforce.com		<input checked="" type="checkbox"/>	Chatter Free User
<input type="checkbox"/> Edit	Guison, Auggie	aguus	aguus.ybda8eoyf2pk.8pibwixczyp.9sn6jwk0laqw.hruko2bdgk0 @project.vit		<input checked="" type="checkbox"/>	Cross Org Data Proxy User
<input type="checkbox"/> Edit	Hitler, Adolf	ahiti	yanun.belma2@gmail.com	Operator 2	<input checked="" type="checkbox"/>	operator
<input type="checkbox"/> Edit	Obama, Barak	bobam	yanun.belma1@gmail.com	Operator 1	<input checked="" type="checkbox"/>	operator
<input type="checkbox"/> Edit	Pandey, Vanun	VPand	yanun@project.vit		<input checked="" type="checkbox"/>	System Administrator
<input type="checkbox"/> Edit	Teddy, John	tedd	yanun.belma@gmail.com	Vehicle Manager	<input checked="" type="checkbox"/>	Vehicle Manager
<input type="checkbox"/> Edit	User Integration	integ	integration@00d21000000fsaoea2.com		<input checked="" type="checkbox"/>	Analytics Cloud Integration User
<input type="checkbox"/> Edit	User Security	sec	insightssecurity@00d21000000fsaoea2.com		<input checked="" type="checkbox"/>	Analytics Cloud Security User

New User

Reset Password(s)

Add Multiple Users

Add profiles –

Setup

Home

Object Manager

Search Setup

Users

Profiles

Didn't find what you're looking for?

Try using Global Search.

SETUP

Profiles

Profiles

Help for this Page

All Profiles

Edit | Delete | Create New View

New Profile

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Y

Z

Other

All

Action	Profile Name	User License	Custom
<input type="checkbox"/> Edit Del ...	Vehicle Manager	Salesforce	<input checked="" type="checkbox"/>

1-1 of 1

0 Selected

Previous


Next

Page 1 of 1

Setup Roles -


[illegible]

Add Vehicle Records –




Vehicle Management

Accounts ▾Contacts ▾Opportunities ▾Vehicles ▾Drivers ▾Travelers ▾Reports ▾Dashboards ▾







 Vehicles





Recently Viewed ▾




4 items • Updated a few seconds ago

Q Search this list...



	<input type="checkbox"/> Vehicle Name	
1	<input type="checkbox"/> Pulser	
2	<input type="checkbox"/> XUV-500	
3	<input type="checkbox"/> X60	
4	<input type="checkbox"/> honda	

Add Drivers Records –



★

+

🔄

?

⚙️

🔔20

Vehicle Management

Accounts

Contacts

Opportunities

Vehicles

Drivers

Travelers

Reports

Dashboards

Drivers

Recently Viewed

🔽

👤

New

Import

Change Owner

🔍 Search this list...

⚙️

📄

🔄

✎


🗑️

🔼

4 items • Updated a few seconds ago

	<input type="checkbox"/> Driver Name	
1	<input type="checkbox"/> Dhruv Rathi	🔼
2	<input type="checkbox"/> pravanshu pati	🔼
3	<input type="checkbox"/> Abhay Singh	🔼
4	<input type="checkbox"/> Ramesh Babu	🔼

Add Traveler Records –



★

+

🔄

?

⚙️

🔔20

Vehicle Management

Accounts

Contacts

Opportunities

Vehicles

Drivers

Travelers

Reports

Dashboards

Travelers

Recently Viewed

🔽

👤

New

Import

Change Owner

🔍 Search this list...

⚙️

📄

🔄

✎

🗑️

🔼

3 items • Updated a few seconds ago

	<input type="checkbox"/> Traveler Name	
1	<input type="checkbox"/> Sukhi Yatra	🔼
2	<input type="checkbox"/> Nagar Nigam Travels	🔼
3	<input type="checkbox"/> Verma Travels	🔼

Create reports –

Reports

Recent

3 items

Q Search recent reports...

New Report

New Folder

⚙

REPORTS	Report Name	Description	Folder	Created By	Created On	Subscribed	
Recent	New Vehicles Report		Private Reports	Varun Pandey	3/7/2023, 7:19 pm		▼
Created by Me	New Drivers Report		Private Reports	Varun Pandey	3/7/2023, 7:17 pm		▼
Private Reports	New Travelers Report		Private Reports	Varun Pandey	3/7/2023, 7:16 pm		▼
Public Reports							
All Reports							
FOLDERS							
All Folders							
Created by Me							
Shared with Me							
FAVORITES							
All Favorites							

Create Dashboard -

Vehicle Management
 Accounts
 Contacts
 Opportunities
 Vehicles
 Drivers
 Travelers
 Reports
 Dashboards

+ Component
+ Filter

Save
Done

New Drivers Report

Driver: Driver Name ↑	License No	Mobile No	Fair Per Hour
Abhay Singh	654321	9871236540	50
Dhruv Rathii	555555	9999999990	70
pravanshu pati	123987	9638527410	150
Ramesh Babu	123456	9876543210	999

View Report (New Drivers Report)

New Travelers Report

Traveler: Traveler Name ↑	Traveler Email	Traveler Contact No
Nagar Nigam Travels	nagar.nigam@gmail.com	0731124578
Sukhi Yatra	sukhi.yarta@gmail.com	9988776655
Verma Travels	verma.travels@gmail.com	07311234567

View Report (New Travelers Report)

New Vehicles Report

Vehicle: Vehide Name ↑	2WHEELERS	4WHEELERS	Body Type	Chassic No
honda	HONDA	-	-	2002
Pulser	BAJAJ	-	sportbikes	6666
X60	-	VOLVO	SUV	123456
XUV-500	-	MAHINDRA	SUV	8520

View Report (New Vehicles Report)

7. ADVANTAGES & DISADVANTAGES

Advantages

Streamlined Processes: Salesforce's vehicle management system enables customers to consolidate and automate their vehicle management procedures. As a result, operations become more streamlined, decreasing the need for manual labor and enhancing overall efficiency.

Improved Resource Allocation: By providing instant access to information on vehicle availability and driver assignments, Salesforce empowers customers to optimize how they allocate their resources. This enables effective utilization of vehicles and drivers, minimizing periods of inactivity and maximizing overall productivity.

Enhanced Customer Experience: The system enables customers to provide a seamless and convenient booking experience to travelers. Real-time updates, automated notifications, and easy communication channels contribute to an enhanced customer experience.

Data-Driven Decision Making: Leveraging Salesforce's powerful analytics features, customers can examine essential measurements like vehicle utilization, driver effectiveness, and customer feedback. This empowers them to make informed decisions based on data, fostering ongoing enhancements and more effective strategic planning.

Disadvantages

Learning and Training: Adapting to a new vehicle management system built on Salesforce might necessitate training and acclimation for the customer's staff. The initial phase of getting acquainted with the system may affect productivity temporarily as the transition takes place.

Cost Considerations: Deploying and sustaining a vehicle management system through Salesforce may entail expenses such as licensing fees, customization charges, and recurring subscription costs. It is crucial for customers to thoroughly assess the financial considerations involved and guarantee a favorable return on investment.

Data Security and Privacy: It is essential for customers to establish suitable security measures to protect sensitive data within the Salesforce system. Adhering to data protection regulations and preserving data privacy are crucial factors that need to be taken into account.

System Customization: Salesforce offers extensive customization options, but customers need to invest time and effort to tailor the system to their specific requirements. This may involve collaboration with Salesforce consultants or administrators to ensure the system aligns with the customer's unique needs.

8. APPLICATIONS

Travel and Transportation Agencies: Implementing vehicle management systems can assist travel and transportation agencies in effectively handling tasks such as fleet management, driver allocation, and real-time traveler bookings. This leads to enhanced operational efficiency, improved customer service, and optimized resource utilization.

Car Rental Companies: Car rental companies can leverage vehicle management systems to streamline their operations, effectively handle vehicle inventory, monitor vehicle availability, and automate the booking process. This simplifies the rental experience for customers and enhances internal workflows within the company.

Logistics and Delivery Services: Vehicle management systems can be applied in logistics and delivery services to track and manage a fleet of vehicles used for transporting goods. It facilitates efficient routing, driver assignment, and real-time tracking of deliveries, ensuring timely and optimized logistics operations.

Corporate and Employee Transportation: Companies that provide corporate transportation services or manage their employee transportation can leverage the vehicle management system to schedule and coordinate trips, assign drivers, and monitor vehicle usage. This improves efficiency, reduces administrative overhead, and enhances the overall transportation experience.

Tour and Travel Companies: Vehicle management systems can be utilized by tour and travel companies to manage their transportation services for group tours or excursions. It helps in organizing transportation logistics, assigning drivers, and handling traveler bookings, leading to smooth and well-coordinated travel experiences.

Municipalities and Government Organizations: Municipalities and government organizations responsible for managing public transportation systems can benefit from a vehicle management system. It enables effective management of buses, routes, and driver schedules, resulting in improved public transportation services.

9. CONCLUSION

In conclusion, the vehicle management system built on Salesforce provides a comprehensive solution for effectively managing vehicles, drivers, and traveler bookings. With a centralized database for storing and accessing vehicle information, operations are streamlined and data accuracy is improved. Real-time updates and integration capabilities facilitate collaboration between travel agencies, drivers, and travelers, optimizing resource allocation and coordination.

Through analysis, valuable insights can be gained, such as identifying underutilized vehicles, assessing driver performance, and planning for peak demand periods. Evaluating customer feedback enhances the overall experience, while maintenance analysis and cost assessment help minimize downtime and optimize expenses.

Maintenance analysis helps identify recurring issues and implement preventive measures, minimizing downtime and repair expenses. Cost assessment enables optimization of vehicle management costs, such as fuel consumption and maintenance expenses. Although there may be a learning curve, the benefits of streamlined operations, improved resource allocation, enhanced customer experience, and data-driven decision-making outweigh the disadvantages. However, cost considerations, data security, customization efforts, and training should be carefully addressed during implementation.

10. FUTURE SCOPE

In the future, several enhancements can be made to further improve the Vehicle Management System:

- **Route Optimization:** Implement a feature to optimize routes considering traffic conditions, distance, and vehicle capacity.
- **Automated Alerts and Notifications:** Set up automated notifications for booking confirmations, driver assignments, trip reminders, and vehicle maintenance schedules.
- **Integration with Mapping Services:** Integrate the system with mapping services like Google Maps or Waze for route visualization and real-time traffic monitoring.
- **Driver Performance Tracking:** Monitor driver behavior, safety compliance, and customer feedback to identify areas for improvement.
- **Vehicle Inspection and Checklist:** Enable drivers to perform vehicle inspections and complete checklists before each trip to ensure vehicle safety.
- **Predictive Maintenance:** Use predictive analytics to schedule maintenance activities based on historical data and usage patterns.
- **Integration with Payment Gateways:** Integrate secure payment gateways for online payment options during bookings.
- **Integration with IoT Devices:** Explore integrating IoT devices for real-time vehicle data monitoring, fuel consumption, engine diagnostics, and GPS tracking.

By incorporating these enhancements, the Vehicle Management System can continue to evolve and provide an even more comprehensive and efficient solution for vehicle management needs.

11. BIBLIOGRAPHY

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- Salesforce AppExchange: <https://appexchange.salesforce.com/>
- Salesforce YouTube Channel: <https://www.youtube.com/user/salesforce>
- Salesforce Developer Blogs: <https://developer.salesforce.com/blogs/>