

LONGTERM INTERNSHIP ON SALESFORCE

PROJECT TITLE : VEHICLE MANAGEMENT

FACULTY MENTOR : SRINIVASA RAO

TEAM SIZE : 04 STUDENTS

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INTRODUCTION TO VEHICLE MANAGEMENT

To use the application at Lightning end, it is required to register the domain first. Kindly go through the article: Once you get registered with your Domain, please make sure that custom tabs related to Cab Management System should be default on.

Follow In our previous blog, we reviewed how the right digital platform is key for operational efficiency and better customer experience in fleet management. In this blog, we deep dive into the Fleet Management Solution. We will go over all the elements of a robust Fleet Management Solution and share our perspective and experience in building such a solution on the Salesforce platform

THE PURPOSE OF FLEET MANAGEMENT

- **A complete Fleet Management Solution, if done right, can prove to be a strategic advantage. The solution must be cloud enabled, secure, with mobile first user experience, equipped with data analytics and should be easily integratable with other platforms and partner systems through APIs. To incorporate these aspects, the technology platform should have some core capabilities and some specialized functionalities.**
- **First, let us look at the functionality and what makes up a modern Fleet Management Solution.**



Accident & Infringement



Registration/Renewal



Insurance Details



Vehicle Documents



Fuel Management



Service & Repairing



Notification & Alert System



Vehicle & Driver Allocation



Reports



GPS Tracking



EXISTING PROBLEM

Vehicle 360 – Just like a CRM showing customer 360 view to provide information about various aspects of a customer, a vehicle 360 provides different information about the vehicle such as drivers, insurance details, registration details, mileage details, inspection records, violations, damages, work orders etc.

- **Vehicle Lifecycle** – Vehicle goes through various stages such as PDI, in service, repairs in its lifecycle and the audit history of all these stages may need to be tracked
- **Vehicle Assignment** – Assigning vehicles to drivers, owners. Various assignment rules also need to be evaluated to ensure the assignment constraints are met. The assignment rules could be related to department codes, quotas, budgets, or state level rules about vehicle lease or ownership.
- **Repair Orders** – Managing vehicle repairs, tracking various tasks as part of repairs, adding required and actual parts and labor, tracking time taken to complete. Vehicles may need to go to partners for certain jobs e.g. Body shops. The solution should have a way of capturing the estimates (time and cost) and compare it with the actual time and invoice.

PROPOSED SOLUTION

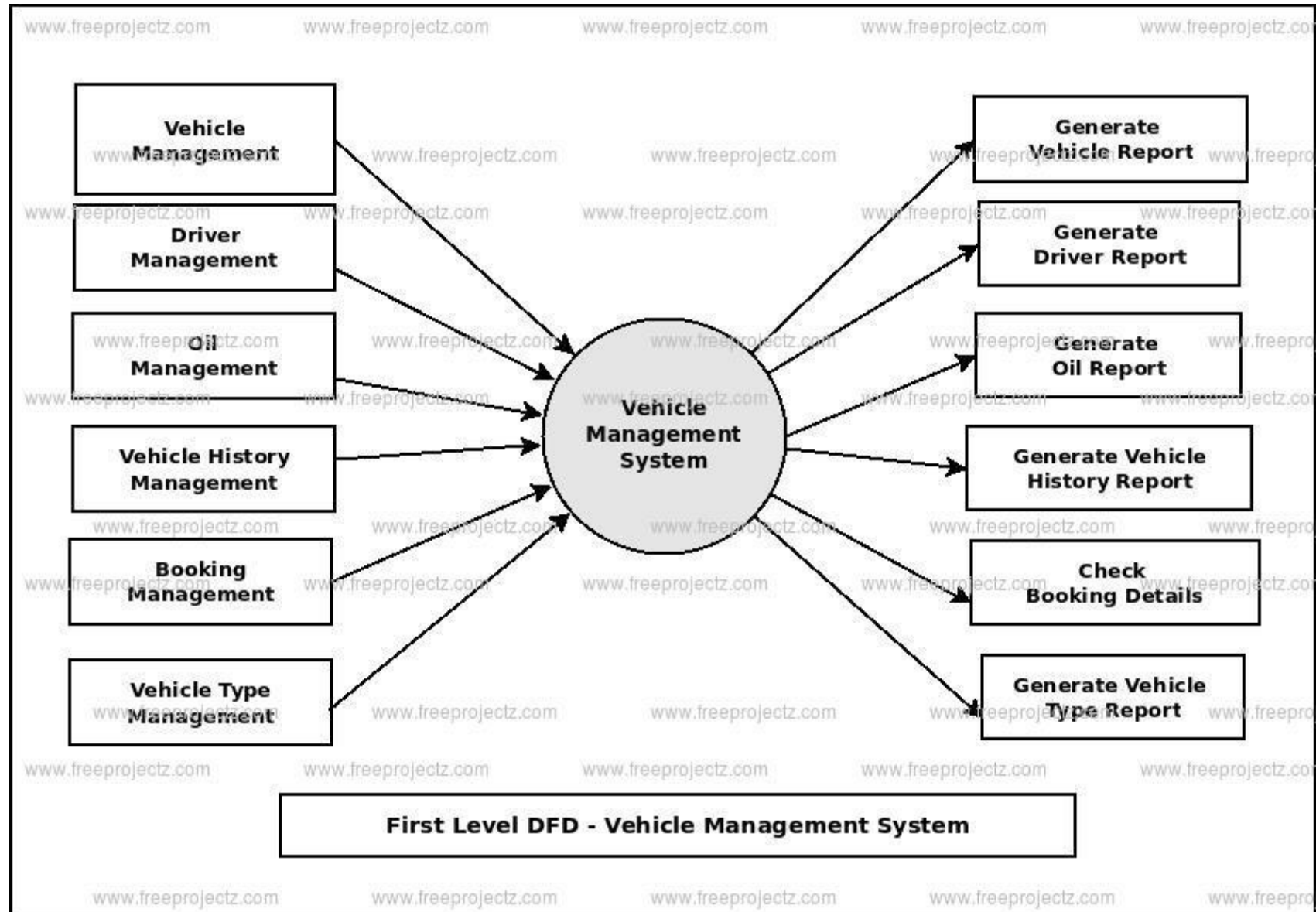
- **Inventory Management** – Managing parts inventory, tracking quantity by location, transferring inventory from warehouse or external vendor to site. Inventory may include vehicle spare parts, consumables or just floor supplies like rags and cleaning supplies.
- **Self Service Portal** – Fleet Management operations typically have a need for a self service portal. It includes managing your lease vehicle ordering, repairs, returns etc. It can also include a portal for administrators to manage shared vehicles. In addition, external vendors/partners can also login to manage their transactions/invoices/payments. The portal may have a driver or location centric functionality to help the vehicles on the road. These services may include finding the best route, nearest fuel station with the best price, repair and service locations.
- **Integrations** – Integrations with government systems, external vendor systems, internal pricing and ERP system etc. need to be in place. Some common integrations would be with finance systems for worker pay and customer billing, insurance companies, title and registrations, violation tracking and compliance.



BLOCK DIAGRAM

Block diagram of the Vehicle Control Unit 2.3 Main functions of VCU

- ① Vehicle driving control: collect driver's driving needs and manage vehicle power.
- ② Network management: monitor communication network, information scheduling, information summary, and act as a gateway.
- ③ The auxiliary drive of the instrument monitors and displays the vehicle status.
- ④ Fault diagnosis processing: Diagnose and detect the faults of sensors, actuators and other components of the system and carry out corresponding fault processing, and display faults in real time.
- ⑤ Energy management and online configuration and maintenance.
- ⑥ Power distribution: Calculate the distribution of motor power through comprehensive vehicle information including battery SOC, battery pack temperature, motor temperature, etc., and perform vehicle drive and braking energy feedback control.
- ⑦ Other driving assistance functions, such as anti-slip car control when starting on a hill.



HARDWARE AND SOFTWARE REQUIREMENTS

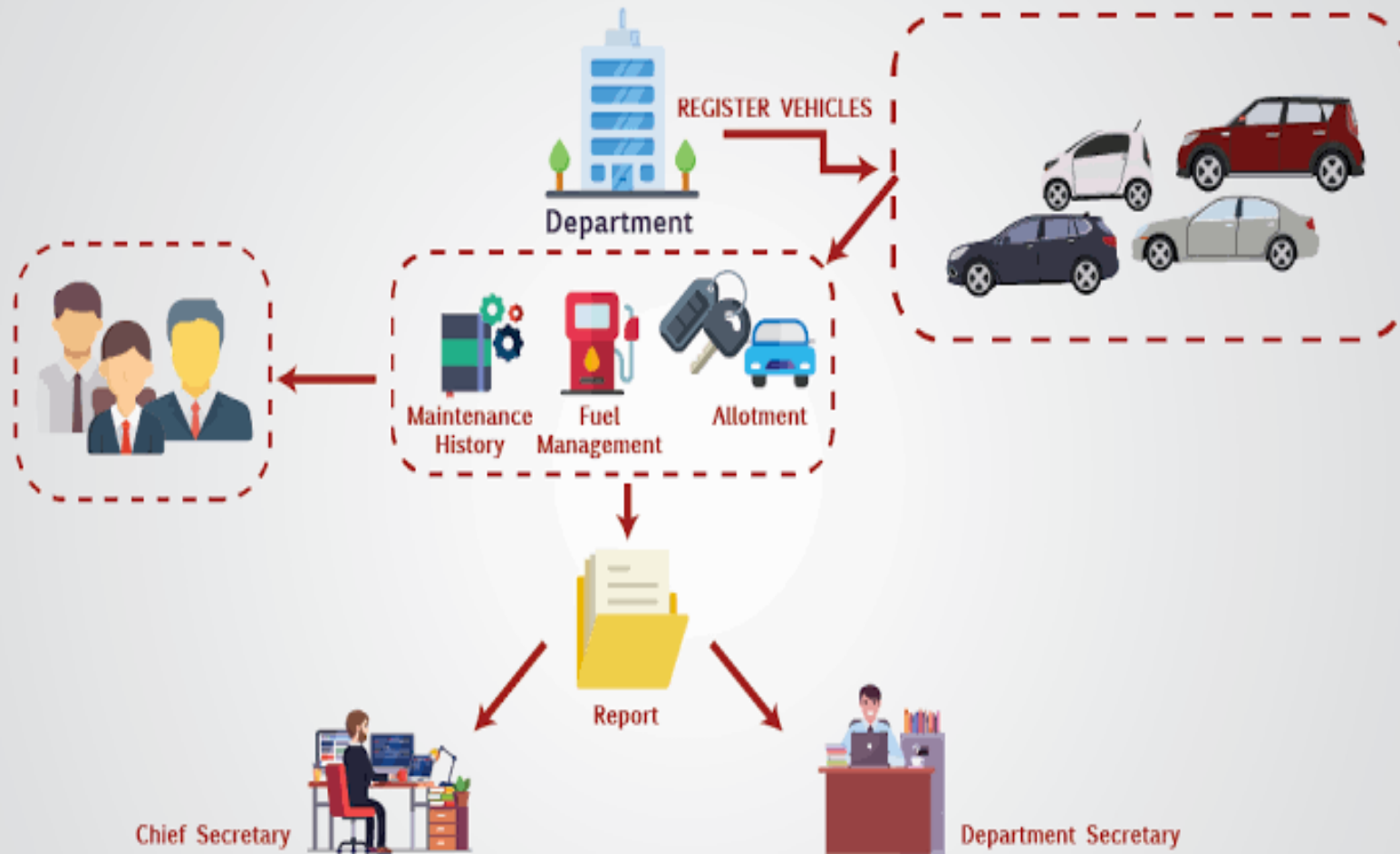
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FINAL FINDINGS

- **Collaboration:** Work gets done through distributed but well connected teams. Ensuring seamless collaboration among internal and external players is a key platform capability. Some important features for collaboration are: Email/Calendar integration, multi-channel alerts, Reminders/Tasks and activity tracking, update feeds, Queue based workflows, groups, sharing documents and working together.
- **Extensible data model and UX:** The solution is not built just once. It is enhanced through iterations as the internal and external needs evolve. Ability to extend and customize not only the user interface but also the underlying platform data model is essential.
- **Intelligence:** You need to have the ability to monitor and continuously improve the key metrics that help you optimize your operations without compromising on service quality. Reports, Dashboards and basic analytics provide the necessary information for this. But beyond basic analytics, the platform also needs to be ready for advanced analytics using machine learning. As more and more data about the fleet is collected through location tracking, photos/images and engine data, the need for advanced analytics is even more compelling. A platform natively providing scoring, machine learning, deep learning, vision/voice processing, recommendation engine, sentiment analysis will have an edge

Vehicles Management System





Vehicle Tracking



Fleet Management

**How Does The Vehicle
Tracking System & Fleet Management Works**

Fleet Management ADVANTAGES

- **A Fleet Management solution will provide essential fleet management functionality to the users but it will still need to leverage various partner, government or agency systems. Seamless functioning of the system will require flexible integration options provided by the platform.**
- **Automation: Rules and Constraints driven automation flows, time based actions, low code workflow configuration, approvals/escalations automate tasks and workflows in the system and make it more efficient. Ability to configure these through a metadata driven approach rather than customized code make it easy to maintain and replicate across Fleet Manager's customer base.**
- **These capabilities provide basic building blocks for any modern digital solution. You have two choices here. You can either piece together all the components of the platform using open source tools and frameworks or go with a platform like Salesforce that is constantly evolving and upgrading its platform three times a year.**

- Inventory management is made easier with out-of-the-box data model and workflows to manage asset and parts inventory. Common tasks such as tracking inventory by location, consuming parts in work orders, transferring inventory, required parts for jobs, shipments and returns can be easily configured in Salesforce Field Service
- With Einstein Vision, mobile employees can use image recognition to immediately identify assets and parts in images. Ensure the right product part is fixed or replaced.
- **Design Considerations**
- When Salesforce is used as a platform to design a Fleet Management solution, all the core and specialised capabilities are used as base building blocks. But when building a solution that will cater to different customer processes and requirements, a few design considerations to keep in mind
- **Configurability of Vehicle Lifecycle:** Fleet vehicles typically go through a lifecycle from acquisition to end of life. Each of the steps will also have some sub-steps or statuses that the vehicle may go through depending on the situation. E.g. A newly received vehicle will go through Pre-Delivery Inspection check and will also get new plates. But a returned vehicle will go through Pre-Delivery Inspection but won't go through plates and registration steps. These stages are also likely to be different for different customer accounts.

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- **Tracking History of Vehicle Attributes:** Certain vehicle information will need to be tracked along with changes in that information. History records will need to be maintained for such cases. e.g., maintaining vehicle drivers, insurance policies, registration history, different types of inspection records over time, mileage records, work orders. All these will have a one-to-many relationship with the main vehicle record.
- **Specialised Desktop and Mobile Views/Workflows:** Certain areas of the solution will need to be designed separately for optimised mobile experience. While the platform provides mobile readiness, mobile optimised UX is needed in specific areas for superior customer experience. The examples of such use cases include vehicle VIN scanning, worker location based activities, tracking time spent on work orders or other related tasks.
- **Notifications:** Notifications and reminders are part of any standard workflow in a solution. But the Fleet Management solution will have a need for various kinds of notifications to be configured at different frequencies, intervals and mode of communication.

- **Vehicle Assignment Rules:** When vehicles in the fleet are assigned to drivers or users, certain assignment rules need to be applied to ensure that specified constraints are met. These rules could be based on state regulations or company policies or based on payment details. Also the assignment rules are not going to be fixed. New rules will need to be added by the users. While the entire assignment rule and criteria doesn't have to be fully configurable, at least a few parameters for each rule will need to be configurable by the user. E.g. Maximum number of vehicles that can be assigned to a single user.
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FLEET MANAGEMENT SOFTWARE



FLEET MANAGEMENT DISADVANTAGES

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- Monthly email to customer for lease renewals starting from 6 months before expiry for up to 4 times or until lease renewed
- When vehicle goes out for specialised repairs, create a task reminder to follow up after a couple of weeks if the vehicle status hasn't changed
- The platform will provide core functionality but additional options must be enabled.
- Extensibility: Your partners or even third party service providers may want to leverage your Fleet Management Solution and provide value added services to your customers. If nurtured well, this could create an ecosystem around your solution that could significantly increase the value and stickiness of your solution.
-
- Compatible with Salesforce Lightning.
- User has the option to link the driver with the specific vehicle .

- **Lightning Configuration**
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- **An Overview**
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Self Service Portal

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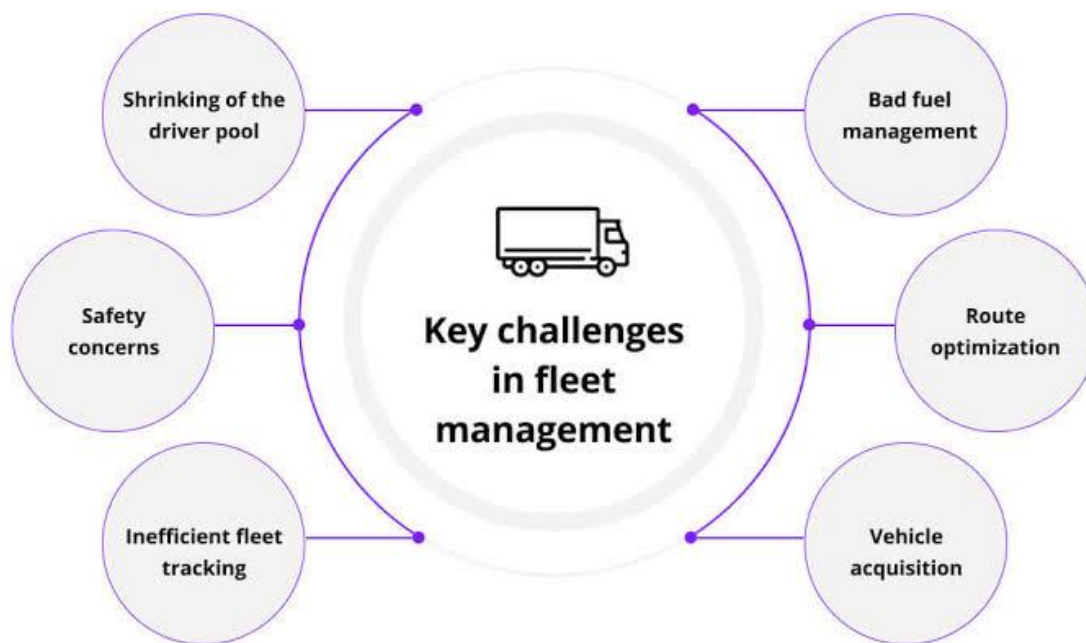
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Fleet Management APPLICATIONS

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CONCLUSION

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Fleet Management Made Easy



- **Extensibility:** Your partners or even third party service providers may want to leverage your Fleet Management Solution and provide value added services to your customers. If nurtured well, this could create an ecosystem around your solution that could significantly increase the value and stickiness of your solution.
- **Compatible with Salesforce Lightning.**
- **User has the option to link the driver with the specific vehicle.**
- **A separate tab for listing of drivers and assigning routes to them. It allows to manage the assigned cabs dispatched for particular route.**
- **User has the option to reserve cab. A calendar view is being displayed to book slot based on time, day and date on basis of route. A history of booking is maintained at admin end.**



FUTURE SCOPE

Tracking History of Vehicle Attributes: Certain vehicle information will need to be tracked along with changes in that information. History records will need to be maintained for such cases. e.g., maintaining vehicle drivers, insurance policies, registration history, different types of inspection records over time, mileage records, work orders. All these will have a one-to-many relationship with the main vehicle record.

Vehicle | Salesforce x Smartinternz x (1) WhatsApp x +

https://d5j00000bcp1neab-dev-ed.develop.lightning.force.com/lightning/setup/ObjectManager/0115j000002qPK0/Details/view

Setup Home Object Manager

Vehicle

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

Scoping Rules

Details

Description

API Name: Vehicle_c

Custom

Singular Label: Vehicle

Plural Label: vehicles

Enable Reports: ☒

Track Activities: ☒

Track Field History: ☐

Deployment Status: Deployed

Help Settings: Standard salesforce.com Help Window

Edit Delete

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Vehicle Field Dependencies

Back to Custom Object: Vehicle

This page allows you to define dependencies between fields (e.g., dependent picklists).

Field Dependencies

Action	Controlling Field	Dependent Field	Modified By
Edit Del	Vehicle Type	2WHEELERS	lahseen shifa shaik, 26/08/2023, 12:39 pm
Edit Del	Vehicle Type	4WHEELERS	lahseen shifa shaik, 26/08/2023, 12:41 pm

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Search Setup

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Instructions

- Double click on a cell to toggle its visibility for the Controlling Field value shown in the column heading.
- To change multiple cells at once, select multiple cells and then click the Include Values or Exclude Values button to change the visibility of all selected cells at once.
- Use SHIFT + click to select a range of adjacent cells. Use CTRL + click to select multiple cells that are not adjacent.
- Use the Preview button to test the results.

Legend

Excluded Value

Included Value

Click button to include or exclude selected values from the dependent picklist.

Include Values

Exclude Values

Showing Columns: 1 - 5 (of 10) < Previous | Next > View All Go to

	HERO	HONDA	BAJAJ	ROYAL ENFIELD	TVS
Vehicle Includes:	Fire Extinguisher	Fire Extinguisher	Fire Extinguisher	Fire Extinguisher	Fire Extinguisher
	First Aid Kit	First Aid Kit	First Aid Kit	First Aid Kit	First Aid Kit
	Multi	Multi	Multi	Multi	Multi
	Charger Kit	Charger Kit	Charger Kit	Charger Kit	Charger Kit
	Stepney	Stepney	Stepney	Stepney	Stepney
	Tool Kit	Tool Kit	Tool Kit	Tool Kit	Tool Kit
	Tracking Device	Tracking Device	Tracking Device	Tracking Device	Tracking Device
	Tyre	Tyre	Tyre	Tyre	Tyre
	Jack	Jack	Jack	Jack	Jack

Showing Columns: 1 - 5 (of 10) < Previous | Next > View All

Click button to include or exclude selected values from the dependent picklist.

Include Values

Exclude Values

Save Cancel Preview

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New Field Dependency

Help for this Page

Create a dependent relationship that causes the values in a picklist or multi-select picklist to be dynamically filtered based on the value selected by the user in another field.

- The field that drives filtering is called the "controlling field." Standard and custom checkboxes and picklists with at least one and less than 300 values can be controlling fields.
- The field that has its values filtered is called the "dependent field." Custom picklists and multi-select picklists can be dependent fields.

Step 1. Select a controlling field and a dependent field. Click Continue when finished.

Step 2. On the following page, edit the filter rules that control the values that appear in the dependent field for each value in the controlling field.

Continue Cancel

Controlling Field ZWHEELERS

Dependent Field Vehicle Type

Continue Cancel