

FIELD SERVICE WORKORDER OPTIMIZATION Report

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PROJECT ABSTRACT

The Field Service Workorder Optimization project aims to enhance the efficiency and effectiveness of managing field service operations. By implementing automated scheduling systems, the project ensures work orders are prioritized and assigned based on technician availability, skills, and proximity, thereby reducing downtime and travel time. Real-time data integration and GPS tracking provide technicians with up-to-date information and directions, facilitating seamless communication with the back office. An intuitive user interface allows technicians to easily access and update job details, while managers benefit from dashboards displaying key performance metrics. This optimization not only increases operational efficiency and reduces costs but also improves customer satisfaction by ensuring timely and high-quality service delivery. Overall, the project leverages technology and data analytics to streamline field service management, resulting in significant improvements in resource utilization and service outcomes.

INTRODUCTION

Efficient management of field service operations is crucial for organizations aiming to provide timely and high-quality service to their customers. The Field Service Workorder Optimization project addresses this need by leveraging advanced scheduling algorithms, real-time data integration, and intelligent resource allocation. In an industry where minimizing downtime, reducing travel time, and enhancing customer satisfaction are paramount, this project seeks to streamline the process of managing and executing work orders. By incorporating technology and data-driven strategies, the project aims to transform traditional field service management, ensuring optimal use of resources and improved service outcomes.

1. Project Overview

Field Service Workorder Optimization is a project aimed at enhancing the efficiency and productivity of managing field service operations. This system focuses on automating the scheduling, assignment, and tracking of work orders for field technicians. It integrates real-time data analytics, location tracking, and resource availability to allocate tasks intelligently, minimizing downtime and travel costs. The solution enables seamless communication between dispatchers and field agents through mobile-friendly interfaces, ensuring updates on task status, priority, and completion. By optimizing workflows and leveraging data-driven decision-making, the system improves service quality, reduces operational expenses, and enhances customer satisfaction.

2. Objectives

The primary objectives of the Field Service Workorder Optimization project are to streamline operations and enhance resource utilization by optimizing the scheduling, assignment, and execution of work orders. It aims to reduce travel time and downtime for field technicians through intelligent routing and scheduling, thereby improving overall productivity and operational efficiency. By leveraging real-time tracking and data analytics, the system enables informed decision-making and continuous performance improvement. Additionally, it fosters seamless communication between dispatchers, technicians, and customers to enhance collaboration and transparency. The project seeks to boost customer satisfaction by ensuring timely service delivery and accurate updates while reducing operational costs through efficient resource management. Designed with scalability in mind, the solution is capable of adapting to increasing workloads and expanding service areas, ensuring long-term business growth and sustainability.

3. Key Salesforce Features and concepts applied

- **Work Order Management:** Utilize Salesforce's Work Order objects to create, assign, and track service tasks. These objects enable efficient documentation and management of service requests.

- **Service Cloud:** Leverage the Service Cloud to centralize customer support, automate workflows, and provide tools for tracking service history, customer interactions, and case resolutions.
- **Reports and Dashboards:** Use Salesforce's reporting and dashboard capabilities to track key performance indicators (KPIs), monitor operational efficiency, and provide actionable insights.
- **Automation with Flows and Process Builder:** Streamline routine processes by automating task creation, notifications, and status updates, reducing manual effort and improving accuracy.

4. Solution Design Steps

Data Model Design

- **Custom Objects:** Products, Orders, Inventory, and Suppliers.
- **Relationships:** Lookup and master-detail for smooth data interaction.

User Interface Design

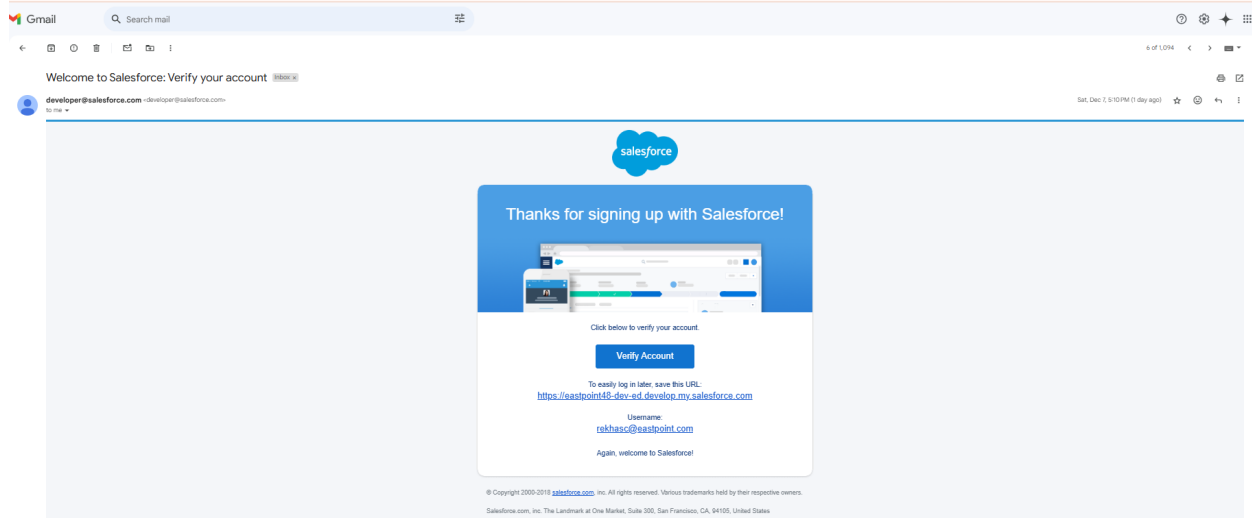
- Designed Lightning pages for intuitive navigation.
- Customized layouts for Accounts, Contacts, and Opportunities. Business Logic.

Implementation

- Automated order approvals through workflow
- Developed Apex triggers for updating inventory post-sales.

1. Salesforce

- Creating Developer Account : Created a developer organization in salesforce platform by filling all the relevant details.



1. **Account Activation** : Then I have got the mail, verified my account, and set up a password.

2.Object

- **Create Technician Object** : After downloading the given Technician spreadsheet, create custom object from spreadsheet, upload the technician.csv file and import the data as shown
- **Create WorkOrderObject** : Same steps to be followed for work order object, here we no need to import the data as shown in the steps.
- **Create Assignment Object** : Creating a custom object with the label name as Assignment and enter the details, then save.

Create a custom object from a spreadsheet

Define object and fields

Choose the data source, map fields and their types, and import field data.

CSV File Details

Encoding Format: Values Separated By: Field Label Source: ☐ Enter manually ☒ Detect from row * Field Labels Row: Import 5 rows of Data?: ☐ No, skip Import ☒ Yes, Import data Record Name Field:

Fields 7 of 7 to import ☐ Hide mapped fields

IMPORT FILE FIELD NAME	SALESFORCE FIELD NAME	SALESFORCE FIELD TYPE	ADD TO LAYOUTS	FIELD PREVIEW
✓ Technician ID	Technician ID	Text	<input checked="" type="checkbox"/>	T-0001
✓ Name	Name	Text	<input checked="" type="checkbox"/>	Raghu
✓ Phone	Phone	Phone	<input checked="" type="checkbox"/>	7892341500
✓ Email	Email	Email	<input checked="" type="checkbox"/>	raghu@gmail.com
✓ Location	Location	Picklist	<input checked="" type="checkbox"/>	Hyderabad
✓ Availability	Availability	Picklist	<input checked="" type="checkbox"/>	Available
✓ Skills	Skills	Picklist	<input checked="" type="checkbox"/>	Machine Installation

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FIG 2.1: Create Technician Object

Create a custom object from a spreadsheet

Define object and fields

Choose the data source, map fields and their types, and import field data.

CSV File Details

Encoding Format: Values Separated By: Field Label Source: ☐ Enter manually ☒ Detect from row * Field Labels Row: Import 2 rows of Data?: ☒ No, skip Import ☐ Yes, Import data Record Name Field:

Fields 7 of 7 to import ☐ Hide mapped fields

IMPORT FILE FIELD NAME	SALESFORCE FIELD NAME	SALESFORCE FIELD TYPE	ADD TO LAYOUTS	FIELD PREVIEW
✓ WorkOrder ID	WorkOrder ID	Text	<input checked="" type="checkbox"/>	WO-[0001]
✓ Email	Email	Email	<input checked="" type="checkbox"/>	example1@workorder.com
✓ Service Type	Service Type	Text	<input checked="" type="checkbox"/>	Maintenance
✓ Description	Description	Text	<input checked="" type="checkbox"/>	
✓ Location	Location	Picklist	<input checked="" type="checkbox"/>	Pune
✓ Priority	Priority	Picklist	<input checked="" type="checkbox"/>	Low
✓ Status	Status	Picklist	<input checked="" type="checkbox"/>	Submitted

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FIG 2.2 : Create WorkOrderObject

FIG 2.3 : Create Assignment Object

Assignment

Custom Object Definition Edit

Save Save & New Cancel

Custom Object Information

The singular and plural labels are used in tabs, page layouts, and reports. Be careful when changing the name or label as it may affect existing integrations and merge templates.

Label: Example: Account

Plural Label: Example: Accounts

starts with vowel sound: ☐

The Object Name is used when referencing the object via the API.

Object Name: Example: Account

Description:

Contact-Sensitive Help Setting: ☒ Open the standard Salesforce.com Help & Training window ☐ Open a window using a Visualforce page

Content Name:

Enter Record Name Label and Format

The Record Name appears in page layouts, key lists, related lists, lookups, and search results. For example, the Record Name for Account is "Account Name" and for Case it is "Case Number". Note that the Record Name field is always called "Name" when referenced via the API.

Record Name: Example: Account Name

Data Type: Warning: If you plan to insert a high volume of records in this object, via the API for example, use the Text data type.

Display Format: Example: A-0000 What is This?

3.Tabs

Creating a Custom Tab : Select the Tabs option in Quick find box and create new tab named Assignment

The image shows two screenshots from the Salesforce Setup interface. The top screenshot is the 'Edit Custom Object Tab' page for 'Assignments'. It shows the 'Custom Tab Definition Edit' section with fields for 'Tab Label' (Assignments), 'Object' (Assignment), 'Tab Style' (Cell phone), and a 'Splash Page Custom Link' dropdown set to '--None--'. There is also a 'Description' text area. The bottom screenshot is the 'Custom Tabs' overview page. It shows a list of 'Custom Object Tabs' with columns for 'Action', 'Label', 'Tab Style', and 'Description'. The tabs listed are 'Assignments' (Airplane style), 'Technician - Technician' (Box style), and 'Work Order ID' (Box style). There is also a section for 'Web Tabs' which currently shows 'No Web Tabs have been defined'.

Custom Tab Definition Edit

Custom Object Tab Information

Tab Label: Assignments

Object: Assignment

Tab Style: Cell phone

(Optional) Choose a Home Page Custom Link to show as a splash page the first time your users click on this tab.

Splash Page Custom Link: --None--

Enter a short description.

Description:

Custom Tabs

You can create new custom tabs to extend Salesforce functionality or to build new application functionality.

Custom Object tabs look and behave like the standard tabs provided with Salesforce. Web tabs allow you to embed external web applications and content within the Salesforce window. Visualforce tabs allow you to embed Visualforce pages. Lightning Component tabs allow you to add Lightning components to the navigation menu in Lightning Experience and the mobile app. Lightning Page tabs allow you to add Lightning Pages to Lightning Experience and the mobile app.

Action	Label	Tab Style	Description
Edit Del	Assignments	Airplane	
Edit Del	Technician - Technician	Box	
Edit Del	Work Order ID	Box	

Web Tabs

No Web Tabs have been defined

By default, Technician and WorkOrder tabs will be created once the custom object is created.

4. The Lightning App

1. **Create a Lightning App :** Again, in quick find box, go to app manager and create new lightning app with the name of project and some further details.
 - a. Add Navigation Items (i.e, Home, WorkOrder, Assignments, Technician, Reports and Dashboards)

- b. Add User Profile(i.e, System Administrator)
- c. Then click save and finish

App Details & Branding

Give your Lightning app a name and description. Upload an image and choose the highlight color for its navigation bar.

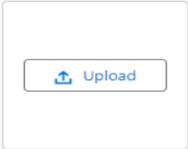
App Details


* App Name ⓘ
Field Service WorkOrder Optimization

* Developer Name ⓘ
Field_Service_WorkOrder_Optimization

Description ⓘ
Give a meaningful description
Image

App Branding

Image ⓘ



Primary Color Hex Value ⓘ
 #0070D2

Org Theme Options
☐ Use the app's image and color instead of the org's custom theme









FIG 4.1: Create LightningApp

Navigation Items







Choose the items to include in the app, and arrange the order in which they appear. Users can personalize the navigation to add or move items, but users can't remove or rename the items that you add. Some navigation items are available only for phone or only for desktop. These items are dropped from the navigation bar when the app is viewed in a format that the item doesn't support.

Available Items ⓘ  Create ▼

Type to filter list...

	Accounts
	All Sites
	Alternative Payment Methods
	Analytics
	App Launcher
	Appointment Categories
	Appointment Invitations
	Annual Requests

Selected Items

	Home
	WorkOrder
	Assignments
	Technician
	Reports
	Dashboards

Navigation controls: < > < >

FIG 4.2 : Add Navigation Items

User Profiles

Choose the user profiles that can access this app.

Available Profiles

Analytics Cloud Integration User

Analytics Cloud Security User

Authenticated Website

Selected Profiles

System Administrator

FIG 4.3 Add User Profile

5. Fields & Relationships

Creating Lookup Field In Assignment Object : In Assignment go to Fields& Relationships and createa new field labeled as WorkOrder and datatype as Lookup

The screenshot shows the Salesforce Setup interface. The breadcrumb trail is: SETUP > OBJECT MANAGER > Assignment. The left sidebar shows the 'Fields & Relationships' tab selected. The main content area is titled 'Assignment Custom Field Work Order ID' with a 'Back to Assignment' link. Below this is the 'Custom Field Definition Detail' section, which includes a table of field information and a 'Validation Rules' section.

Field Information			
Field Label	Work Order ID	Object Name	Assignment
Field Name	Work_Order_ID	Data Type	Lookup
API Name	Work_Order_ID__c		
Description			
Help Text			
Data Owner			
Field Usage			
Data Sensitivity Level			
Compliance Categorization			
Created By	Rekha S.C. 07/12/2024, 5:39 pm	Modified By	Rekha S.C. 07/12/2024, 5:39 pm

Manage your Picklist Values: In ObjectManager select WorkOrder object go to fields &relationships. In that location field add new values (i.e,Nasik, Warangal, Nanded).

Validation Rules

No validation rules defined.

Values

New Reorder Replace Printable View Chart Colors

Delete Selected Deactivate Selected Replace Selected

Action	Values	API Name	Default	Chart Colors	Modified By
<input type="checkbox"/> Edit Del Deactivate	Value1	Value1	<input type="checkbox"/>	Assigned dynamically	Rekha S.C., 07/12/2024, 5:59 pm
<input type="checkbox"/> Edit Del Deactivate	Nasik	Nasik	<input type="checkbox"/>	Assigned dynamically	Rekha S.C., 07/12/2024, 6:06 pm
<input type="checkbox"/> Edit Del Deactivate	Warangal	Warangal	<input type="checkbox"/>	Assigned dynamically	Rekha S.C., 07/12/2024, 6:06 pm
<input type="checkbox"/> Edit Del Deactivate	Nanded	Nanded	<input type="checkbox"/>	Assigned dynamically	Rekha S.C., 07/12/2024, 6:06 pm

Inactive Values

Delete Unused Values

No Inactive Values values defined.

Back To Top

Always show me more records per related list

Add more values in the fields of priority(i.e, High) and Servicetype(i.e, Hardware repair,Troubleshoot/Debugging, Lane-Management).

Creating Formula Field in WorkOrder Object:Now create a Formula Datatypeand give the field label as "date". The formula is "CreateDate".

Custom Field Definition Detail

Edit Set Field-Level Security View Field Accessibility Where is this used?

Field Information

Field Label	Date	Object Name	Assignment
Field Name	Date		
API Name	Date__c		
Description			
Help Text			
Data Owner			
Field Usage			
Data Sensitivity Level			
Compliance Categorization			
Created By	Rekha S.C., 07/12/2024, 6:20 pm	Modified By	Rekha S.C., 07/12/2024, 6:20 pm

Formula Options

Data Type	Formula
CreateDate	

Now, in the Assignment object, create a Formula Datatypein Fields &relationships. Add Technician ID with return type Date.

Add Assignment Date with Formula with return type date (WorkOrder_ID_r.Date_c).
Add Completion Date with Formula with return type date " IF(ISPICKVAL(WorkOrder_ID_r.Status_c , 'Resolved'), WorkOrder_ID_r.LastModifiedDate ,NULL)"

6.Profiles

Technician Profile : To create a new profile in Salesforce, navigate to Setup, type "Profiles" in the Quick Find box, and select "Profiles." Click "New Profile," choose "Standard Platform User" as the existing profile, name it "Technician," and click "Save." On the profile page, click "Edit." Scroll to Custom Object Permissions and grant Read- only access for Technician, WorkOrder, and Assignment objects, then click "Save." On the profile detail page, scroll to Custom Field-Level Security, click "View" next to the WorkOrder object, then "Edit." Enable the checkbox for the Status field and click "Save."

eastpoint48-dev-ed.develop.lightning.force.com/lightning/setup/EnhancedProfiles/page?address=%2F00eWU000007g7lp

Search Setup

Setup Home Object Manager

profiles

Users

Profiles

Didn't find what you're looking for? Try using Global Search.

Profiles

Object	Basic Access	Data Administration
	Read Create Edit Delete View All Modify All	View All Modify All
Contact Point Addresses	<input type="checkbox"/>	<input type="checkbox"/>
Contact Point Consents	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Contact Point Emails	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sellers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Streaming Channels	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
User External Credentials	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Custom Object Permissions

Object	Basic Access	Data Administration
	Read Create Edit Delete View All Modify All	View All Modify All
Assignments	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Technician - Technician	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Work Order ID	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Session Settings

Session Times Out After: 2 hours of inactivity

Session Security Level Required at Login

Password Policies

User passwords expire in: 90 days

Enforce password history: 3 passwords remembered

7.Users

Create User : Go to User and create a new one with new name and other details such as last-name, alias, email, username, nickname, user license, and profiles.

eastpoint48-dev-ed.develop.lightning.force.com/lightning/setup/ManageUsers/page?address=%2F005WU000008cjCQ%3FnoRedirect%3D1%26isUserE...

Search Setup

Setup Home Object Manager

users

Users

Permission Set Groups

Permission Sets

Profiles

Public Groups

Queues

Roles

User Management Settings

Users

Feature Settings

Data.com

Prospector Users

Users

User Profile Help for this Page

User: Elina Gilbert

Permission Set Assignments (0) | Permission Set Assignments: Activation Required (0) | Permission Set Group Assignments (0) | Permission Set License Assignments (0) | Personal Groups (0) | Public Group Membership (0) | Queue Membership (0) | Team (0) | Managers in the Role Hierarchy (0) | OAuth Apps (0) | Third-Party Account Links (0) | Installed Mobile Apps (0) | Authentication Settings for External Systems (0) | Login History (0+) | User Provisioning Accounts (0)

User Detail

Edit Sharing Reset Password Freeze View Summary

Name	Elina Gilbert	Role	
Alias	elina	User License	Salesforce Platform
Email	rekhasc48@gmail.com [Verify]	Profile	Technician
Username	elina@eastpoint.com	Active	<input checked="" type="checkbox"/>
Nickname	elina	Marketing User	<input type="checkbox"/>
Title		Offline User	<input type="checkbox"/>
Company		Knowledge User	<input type="checkbox"/>
Department		Flow User	<input type="checkbox"/>
Division		Service Cloud User	<input type="checkbox"/>
Address	SOKKE Ajjampura taluk Chikmagalur district	Site.com Contributor User	<input type="checkbox"/>

8.Apex Trigger

Create Apex Class : To create a new Apex Class in Salesforce, go to Setup, click the gear icon, and select "Developer Console." The Developer Console will open in a new window. Click on "File," then "New," and select "Apex Class." Name the class "WorkOrderClass" and click "OK."

Create Apex Trigger : To create a new Apex Trigger in Salesforce, open the Developer Console, click on "File," then "New," and select "Apex Trigger." Name the trigger "WorkOrderTrigger" and select "WorkOrder c" from the sObject dropdown. Click "Submit" to create the trigger.

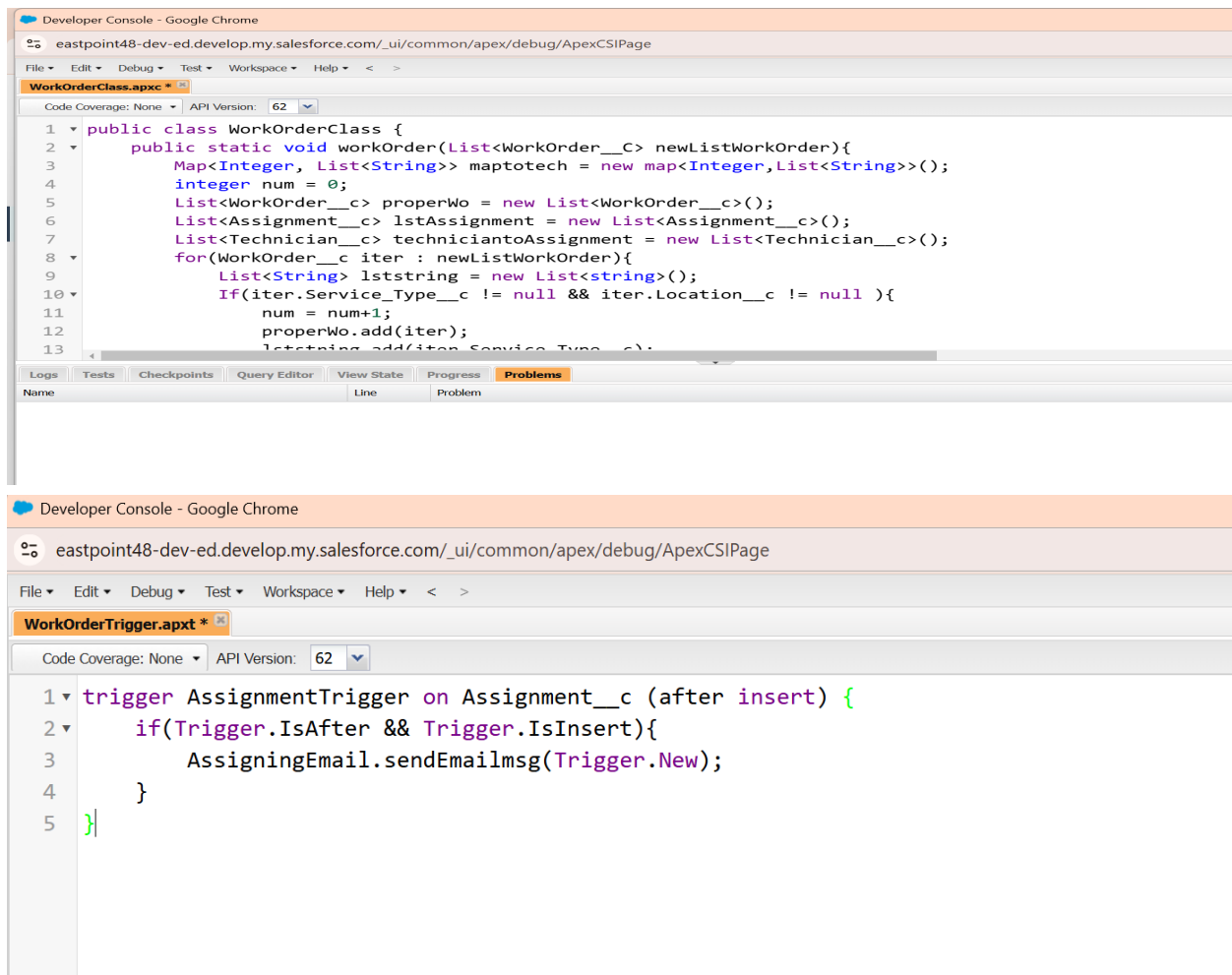


FIG 8.1 WorkOrder Apex Class and Trigger Code

Create Apex Class : To create a new Apex Class in Salesforce, go to Setup, click the

gear icon, and select "Developer Console." The Developer Console will open in a new window. Click on "File," then "New," and select "Apex Class." Name the class "AssigningEmail" and click "OK."

Create Apex Trigger : To create a new Apex Trigger in Salesforce, open the Developer Console, click on "File," then "New," and select "Apex Trigger." Name the trigger "AssignmentTrigger" and select "WorkOrder c" from the sObject dropdown. Click "Submit" to create the trigger.

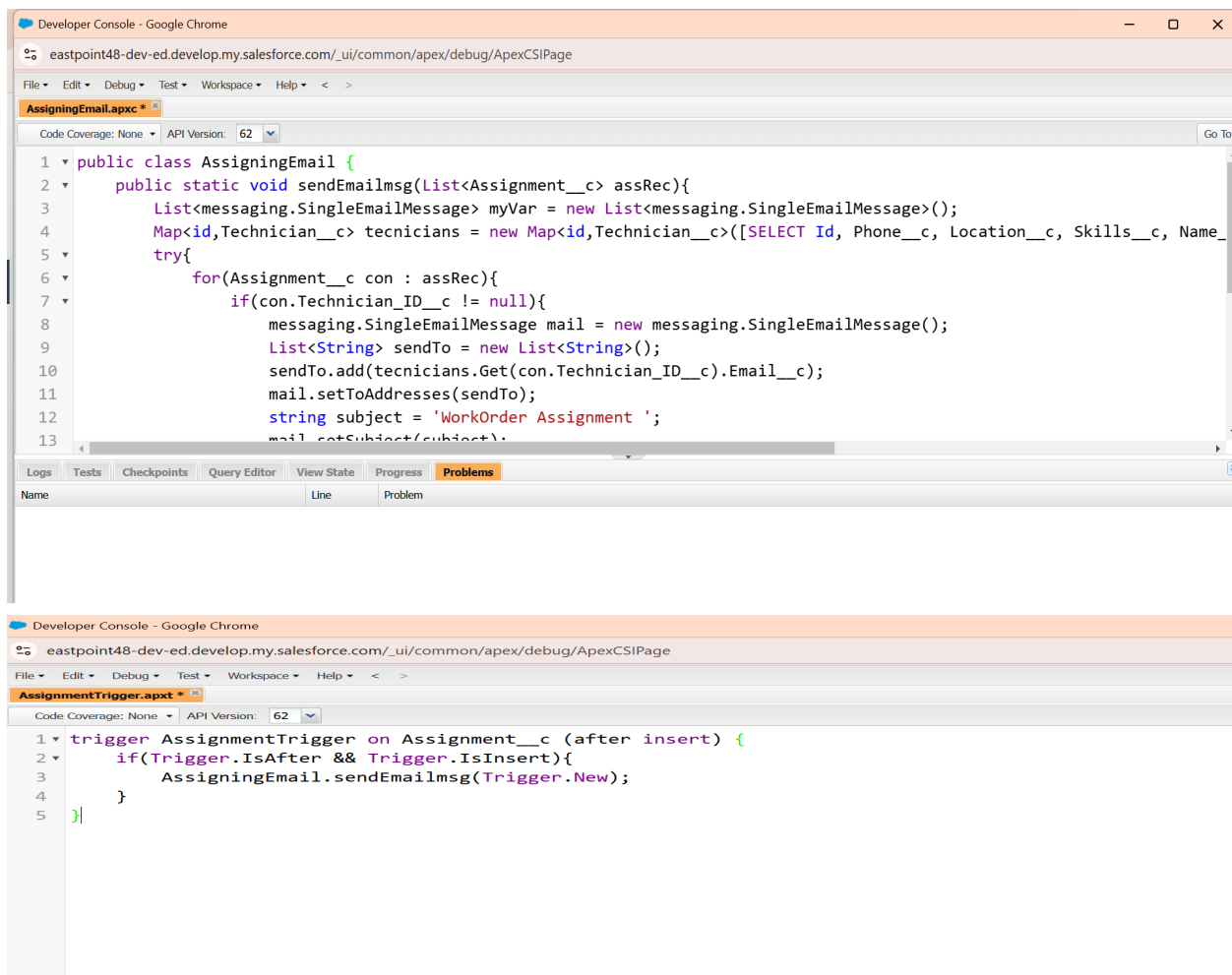


FIG 8.2 Assignment Apex Class and Trigger Code

Create Apex Class : To create a new Apex Class in Salesforce, go to Setup, click the gear icon, and select "Developer Console." The Developer Console will open in a new window. Click on "File," then "New," and select "Apex Class." Name the class

"CompletionMail" and click "OK".

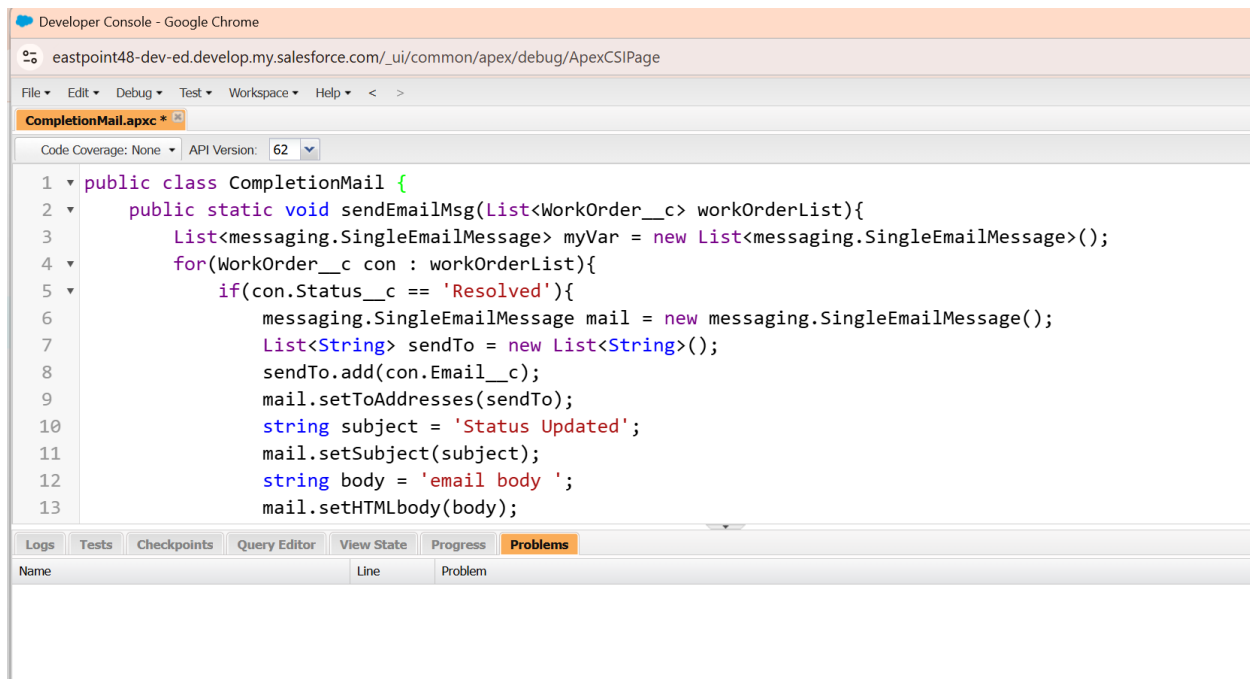


FIG 8.3 Completion Apex Class Code

Create an Asynchronous Apex Class : To create a new Apex Class in Salesforce, go to Setup, click the gear icon, and select "Developer Console." The Developer Console will open in a new window. Click on "File," then "New," and select "Apex Class." Name the class "Record Deletion" and click "OK."

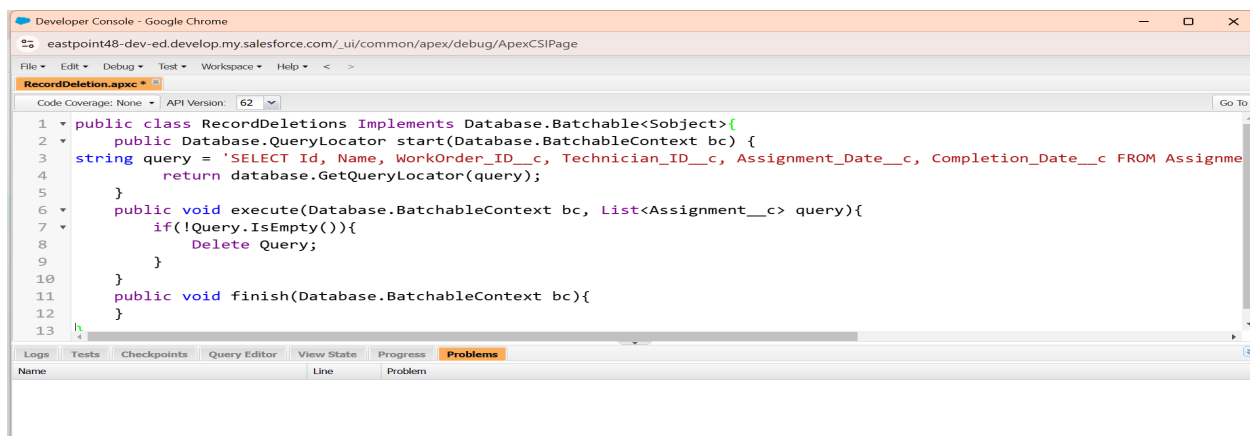
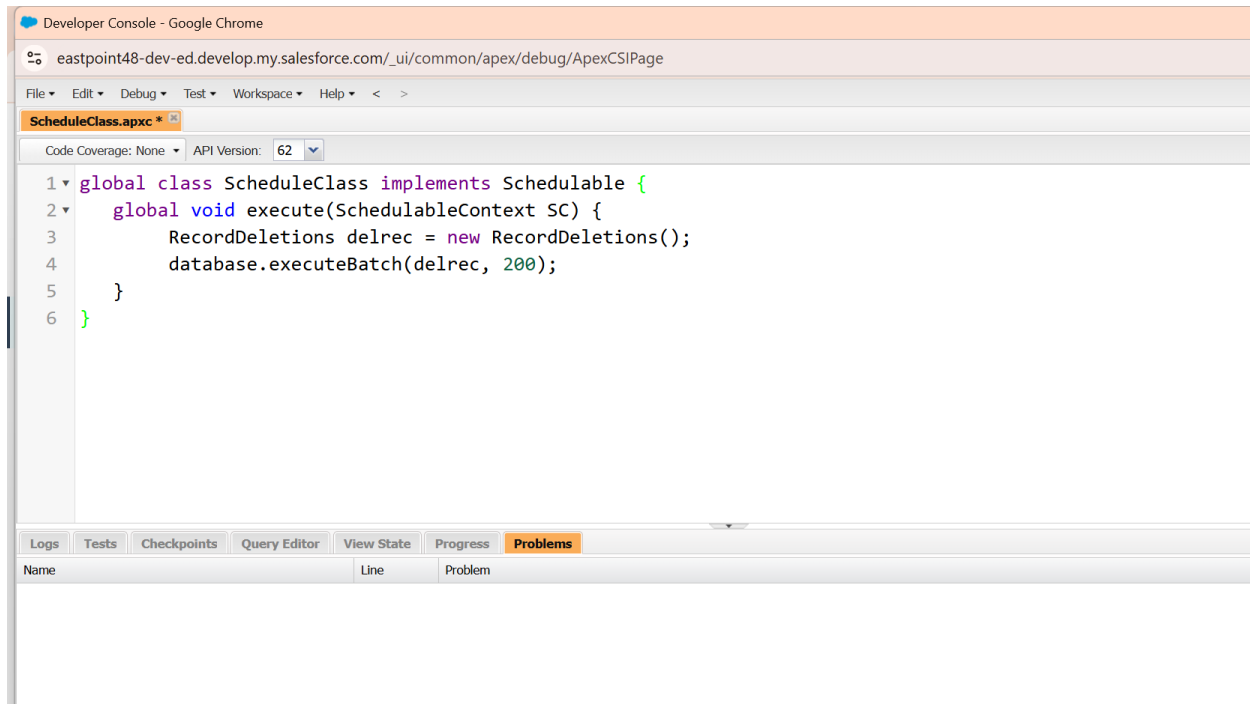


FIG 8.4 RECORD DELETION APEX CLASS CODE

Create an Apex Schedule Class : To create a new Apex Class in Salesforce, go to Setup, click the gear icon, and select "Developer Console." The Developer Console will open in a new window. Click on "File," then "New," and select "Apex Class." Name the class

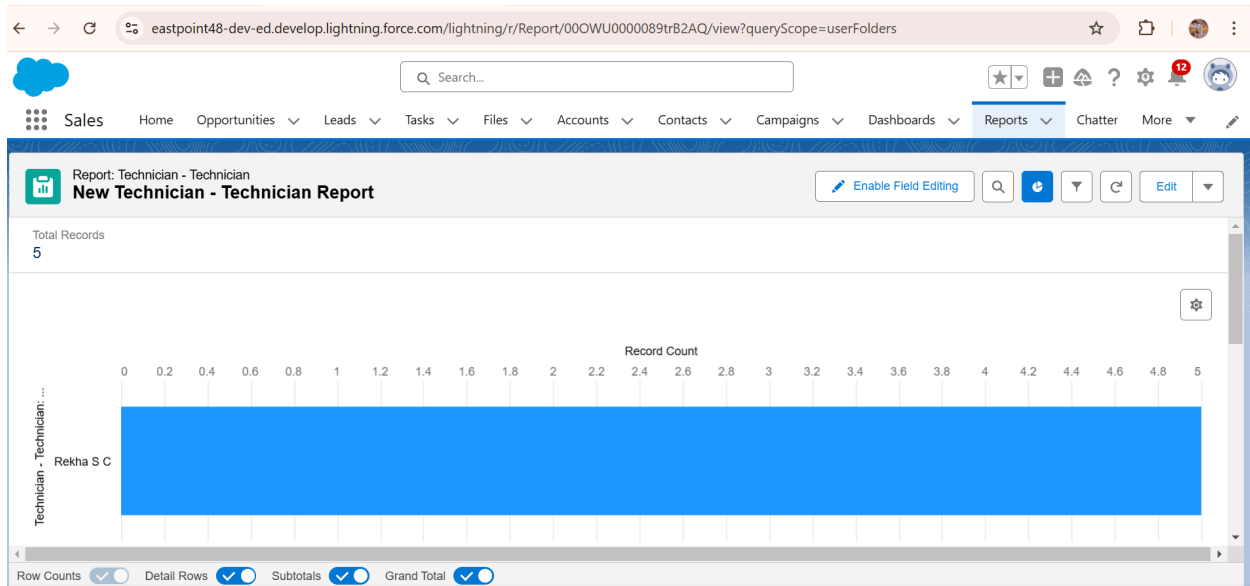
"Schedule" and click "OK."



Create A Schedule Apex : To schedule an Apex class in Salesforce, go to Setup and search for "Apex Classes" in the Quick Find box. Click on "Schedule Apex." Enter the Job Name as "DeleteAssignmentSchedule," select "ScheduleClass" using the lookup icon for the Apex Class, set the Frequency to "Monthly," and choose a Preferred Start Time. Save the schedule to automate the Apex class execution.

9. Reports & Dashboards

Create Reports : To create a new report in Salesforce, go to the app and click on the Reports tab. Click "New Report." Select the report type from the category, report type panel, or search panel, then click "Start Report." Customize your report by adding fields from the left pane. Group the report by Work Order ID for better organization. Save and run the report to view the results.



Create Dashboards : To create a dashboard in Salesforce, go to the app and click on the Dashboards tab. Click "New Dashboard," give it a name, and click "Create." Select "Add Component," choose the report you created previously, and click "Select." Click "Add," then "Save," and finally, click "Done" to complete the dashboard setup.

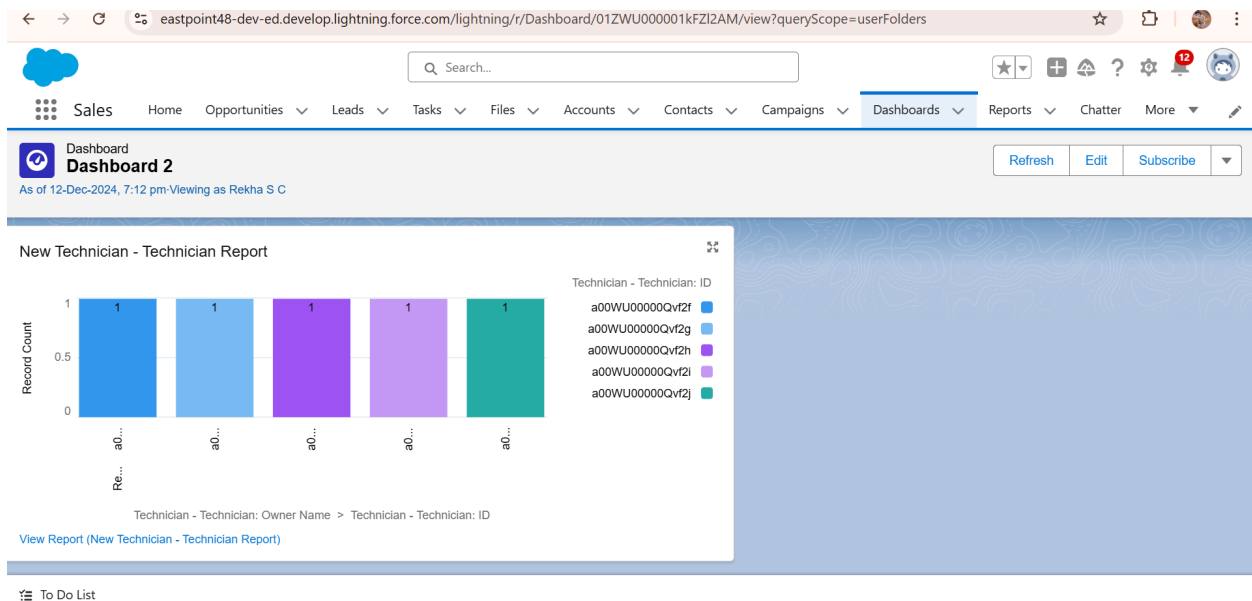


FIG 9.1 Technician and Assignment Details Report Dashboard

5. Testing and Validation

Unit Testing

- Apex classes and triggers achieved over 90% code coverage.

User Interface Testing

- Verified responsiveness and usability across multiple device

End-to-End Testing

- Confirmed seamless integration and workflow performance.

6. Salesforce Use Case Addressed

The Salesforce solution addresses the **Field Service Management** use case, where organizations face challenges in efficiently managing and optimizing their field operations. This includes scheduling and dispatching technicians, tracking work orders, reducing operational inefficiencies, and enhancing customer experiences. By leveraging Salesforce's Field Service Lightning (FSL), Service Cloud, and mobile capabilities, the system enables real-time management of work orders, intelligent task allocation, and seamless communication between field technicians and the back office.

This use case focuses on improving resource utilization, minimizing travel time, and ensuring timely service delivery while providing customers with updates on job status. It also supports data-driven insights to optimize field operations, ensuring that businesses can meet service-level agreements (SLAs), reduce costs, and increase customer satisfaction.

7. Conclusion

The Field Service Workorder Optimization project, powered by Salesforce, provides a comprehensive solution to address the complexities of managing field operations. By leveraging Salesforce features such as Field Service Lightning, Service Cloud, and mobile capabilities, the system streamlines work order management, enhances resource allocation, and facilitates real-time communication.

It not only improves operational efficiency and reduces costs but also enhances customer satisfaction through timely service delivery and transparent updates. With its scalability and data-driven insights, this solution positions organizations to meet evolving service demands while maintaining high standards of performance and reliability.