

# 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**

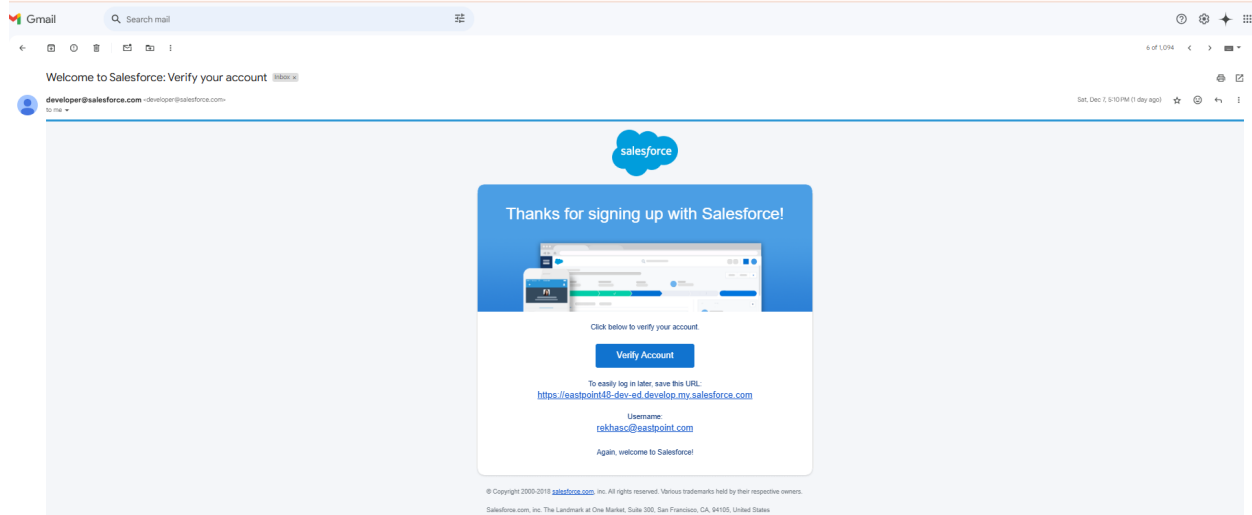
Efficient management of field service operations is crucial for organizations aiming to provide timely and high-quality service to their customers. The Field Service Workorder Optimization project addresses this need by leveraging advanced scheduling algorithms, real-time data integration, and intelligent 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.

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# 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"/>	7892341560
✓ 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

Back Next

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

Back Next

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 screenshot shows the 'Edit Custom Object Tab' page for 'Assignments'. The page title is 'Assignments' with a 'Help for this Page' link. Below the title, it says 'Fill in the fields below to define the custom tab.' The main section is 'Custom Tab Definition Edit' with a sub-section 'Custom Object Tab Information'. This section includes fields for 'Tab Label' (Assignments), 'Object' (Assignment), and 'Tab Style' (Cell phone). There is an optional field for 'Splash Page Custom Link' set to '--None--'. A description field is also present. The browser address bar shows 'eastpoint48-dev-ed.develop.lightning.force.com/lightning/setup/CustomTabs/home'. The left sidebar shows the 'Setup' menu with 'Home' and 'Object Manager' options. The 'Custom Tabs' section in the sidebar is expanded, showing a list of tabs: 'Assignments' (Airplane style), 'Technician - Technician' (Box style), and 'Work Order ID' (Box style). Below this, there is a section for 'Web Tabs' which is currently empty.

Action	Label	Tab Style	Description
<a href="#">Edit</a>   <a href="#">Del</a>	Assignments	Airplane	
<a href="#">Edit</a>   <a href="#">Del</a>	Technician - Technician	Box	
<a href="#">Edit</a>   <a href="#">Del</a>	Work Order ID	Box	

Action	Label	Tab Style	Description
No Web Tabs have been defined			

By default, Technician and WorkOrder tabs will be created once the customobject 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.

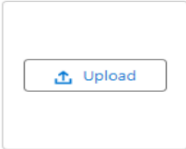
#### App Details


\* 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

**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

eastpoint48-dev-ed.develop.lightning.force.com/lightning/setup/ObjectManager/01IWU0000022cXt/FieldsAndRelationships/00NWU000006Q1mb/view

Search Setup

Setup

Home

Object Manager

SETUP > OBJECT MANAGER

Assignment

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Field Sets

Object Limits

Record Types

Related Lookup Filters

Assignment Custom Field

Work Order ID

Back to Assignment

Validation Rules [0]

Custom Field Definition Detail

Edit

Set Field-Level Security

View Field Accessibility

Where is this used?

Field Information	
Field Label	Work Order ID
Field Name	Work_Order_ID
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).



eastpoint48-dev-ed.develop.lightning.force.com/lightning/setup/ObjectManager/01IWU0000022dLt/FieldsAndRelationships/00NWU000006Q1uk/view

Setup Home Object Manager

SETUP > OBJECT MANAGER

### Work Order ID

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters

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).

Values					
<div> New Reorder Replace Printable View Chart Colors </div> <div> Delete Selected Deactivate Selected Replace Selected </div>					
Action	Values	API Name	Default	Chart Colors	Modified By
<input type="checkbox"/> Edit   Del   Deactivate	Value1	Value1	<input type="checkbox"/>	Assigned dynamically	Swetha Gudivada, 25/07/2024, 6:56 pm
<input type="checkbox"/> Edit   Del   Deactivate	High	High	<input type="checkbox"/>	Assigned dynamically	Swetha Gudivada, 25/07/2024, 7:29 pm

**FIG 5.1 Priority Field**

Values					
<div> New Reorder Replace Printable View Chart Colors </div> <div> Delete Selected Deactivate Selected Replace Selected </div>					
Action	Values	API Name	Default	Chart Colors	Modified By
<input type="checkbox"/> Edit   Del   Deactivate	Value1	Value1	<input type="checkbox"/>	Assigned dynamically	Swetha Gudivada, 25/07/2024, 6:56 pm
<input type="checkbox"/> Edit   Del   Deactivate	Hardware repair	Hardware repair	<input type="checkbox"/>	Assigned dynamically	Swetha Gudivada, 25/07/2024, 7:30 pm
<input type="checkbox"/> Edit   Del   Deactivate	Troubleshoot/Debugging	Troubleshoot/Debugging	<input type="checkbox"/>	Assigned dynamically	Swetha Gudivada, 25/07/2024, 7:30 pm
<input type="checkbox"/> Edit   Del   Deactivate	Lane-Management	Lane-Management	<input type="checkbox"/>	Assigned dynamically	Swetha Gudivada, 25/07/2024, 7:30 pm

**FIG 5.2 Service Type Field**

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

eastpoint48-dev-ed.develop.lightning.force.com/lightning/setup/ObjectManager/01IWU0000022cXt/FieldsAndRelationships/00NWU000006Q3TR/view

Setup Home Object Manager

SETUP > OBJECT MANAGER

### Assignment

Details

**Fields & Relationships**

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Field Sets

Object Limits

Record Types

Related Lookup Filters

**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
CreatedDate	

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

eastpoint48-dev-ed.develop.lightning.force.com/lightning/setup/ObjectManager/01IWU0000022cXt/FieldsAndRelationships/00NWU000006QeCr/view

Setup Home Object Manager

SETUP > OBJECT MANAGER

### Assignment

Details

**Fields & Relationships**

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Field Sets

Object Limits

Record Types

Related Lookup Filters

**Custom Field Definition Detail** Edit Set Field-Level Security View Field Accessibility Where is this used?

**Field Information**

Field Label	Technician ID	Object Name	Assignment
Field Name	Technician_ID		
API Name	Technician_ID__c		
Description			
Help Text			
Data Owner			
Field Usage			
Data Sensitivity Level			
Compliance Categorization			
Created By	Rekha S.C. 08/12/2024, 9:50 am	Modified By	Rekha S.C. 08/12/2024, 9:50 am

**Formula Options**

Data Type	Formula
Work_Order_ID__r.CreatedDate	

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."

Search Setup

Setup Home Object Manager

profiles

Users

Profiles

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

**Profiles**

Object	Read	Create	Edit	Delete	View All	Modify All
Contact Point Addresses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contact Point Consents	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contact Point Emails	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assignments	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technician - Technician	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work Order ID	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input 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.

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: Elina Gilbert

Permission Set Assignments (0) | Permission Set Assignments: Activation Required (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)

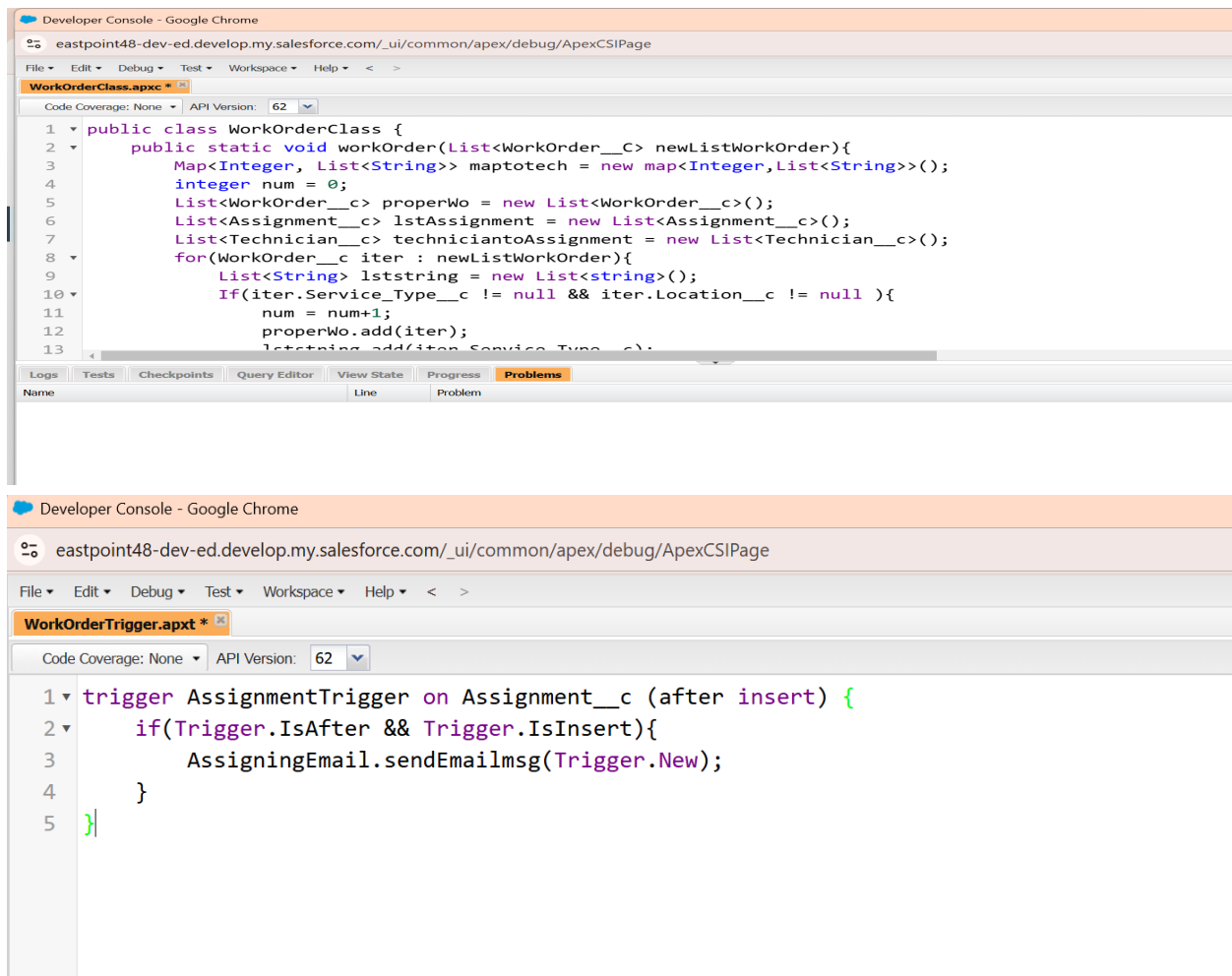
**User Detail** Edit Sharing Reset Password Freeze View Summary

Field	Value	Field	Value
Name	Elina Gilbert	Role	Salesforce Platform
Alias	elina	User License	Technician
Email	rekhasc49@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 Ajampura taluk Chikmandore 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.

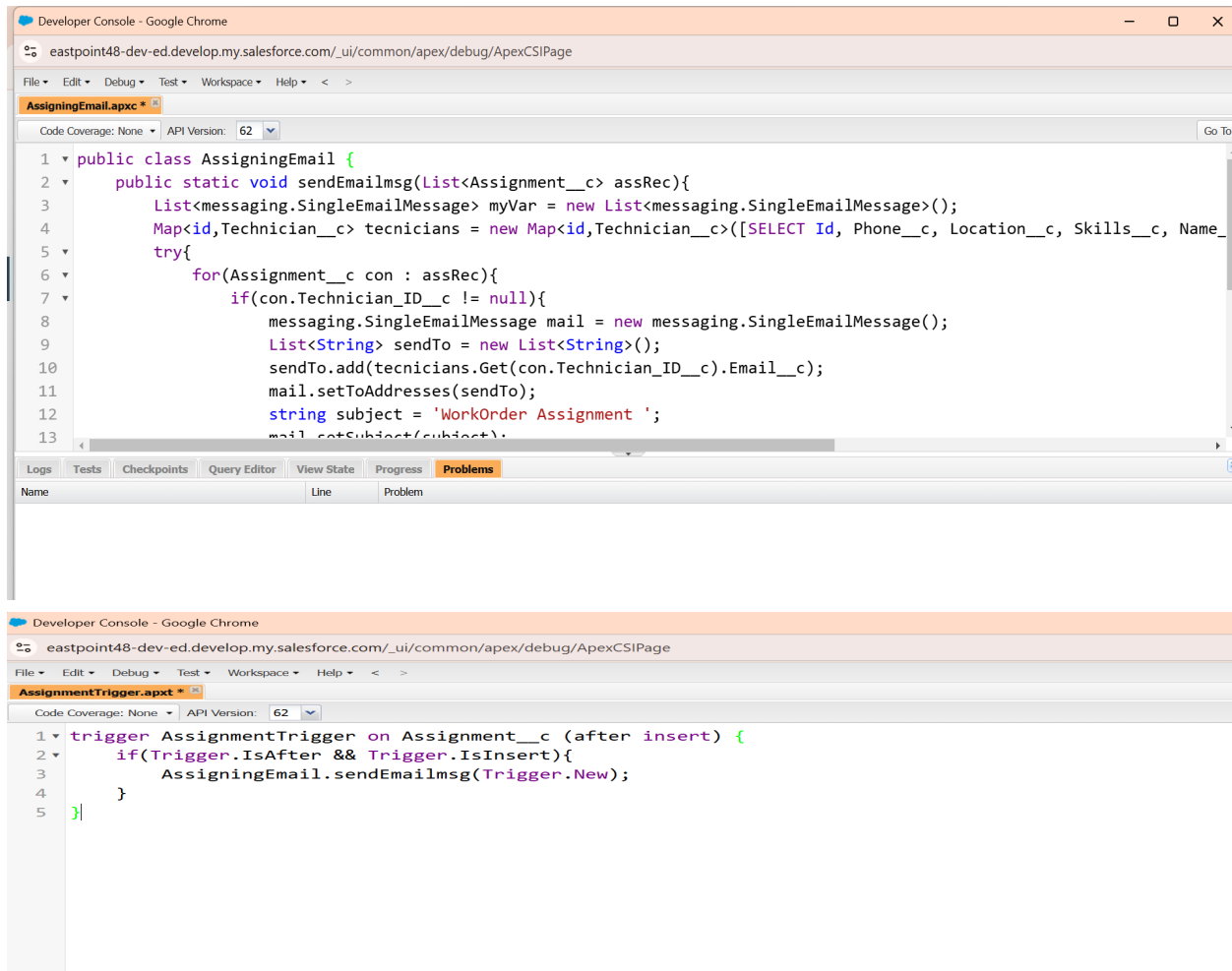


**FIG 8.1 WorkOrder Apex Class and Trigger Code**

**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

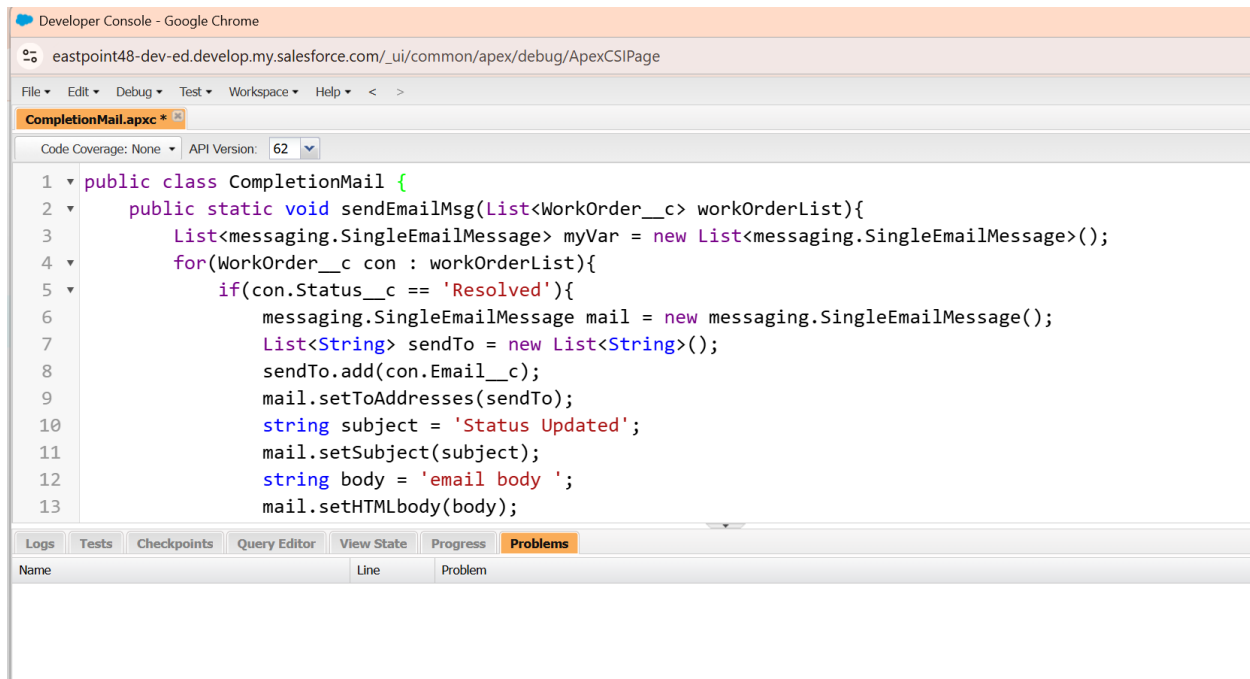
window. Click on "File," then "New," and select "Apex Class." Name the class "AssigningEmail" and click "OK."

**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.



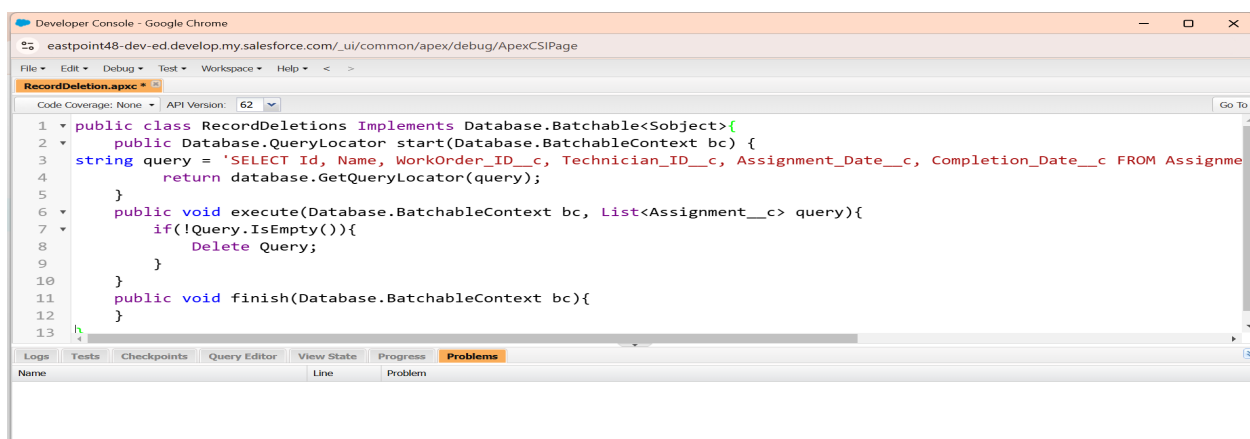
**FIG 8.2 Assignment Apex Class and Trigger Code**

**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".



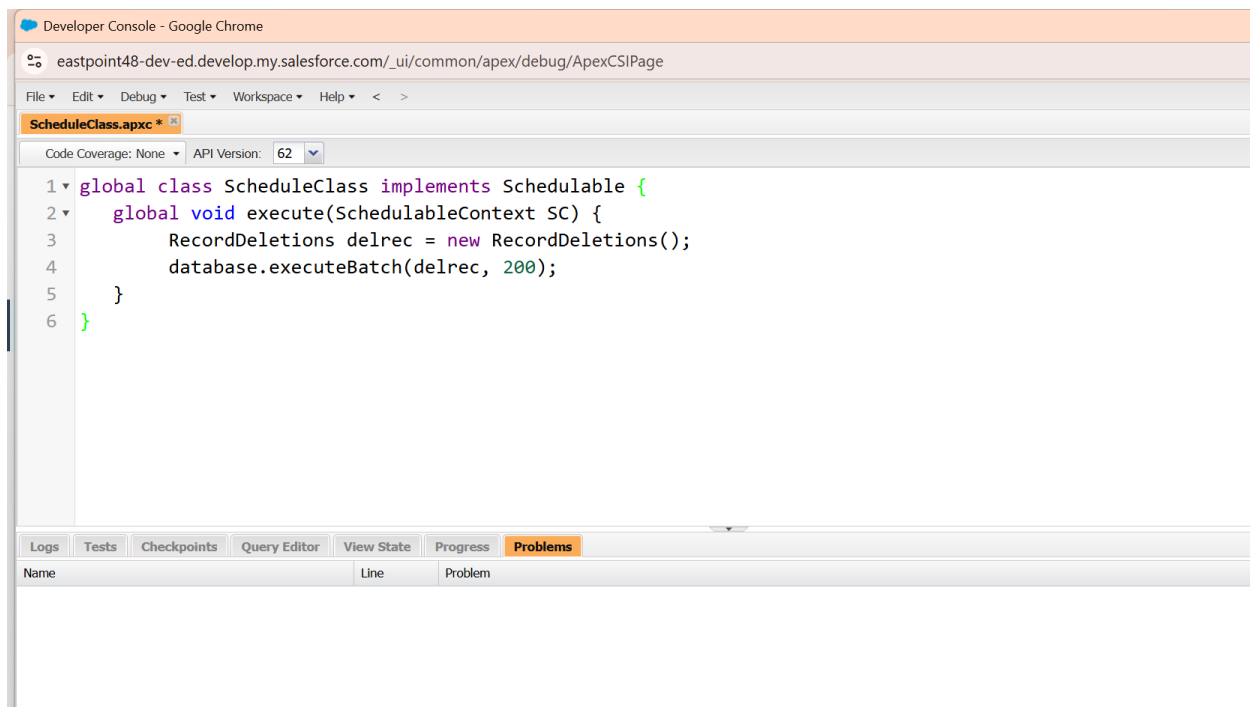
**FIG 8.3 Completion Apex Class Code**

**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."



The screenshot shows the Salesforce Developer Console in Google Chrome. The browser address bar displays the URL: eastpoint48-dev-ed.develop.my.salesforce.com/\_ui/common/apex/debug/ApexCSIPage. The console title is "Developer Console - Google Chrome". The menu bar includes File, Edit, Debug, Test, Workspace, and Help. The active tab is "ScheduleClass.apxc". Below the tab, there are settings for "Code Coverage: None" and "API Version: 62". The main editor area contains the following Apex code:

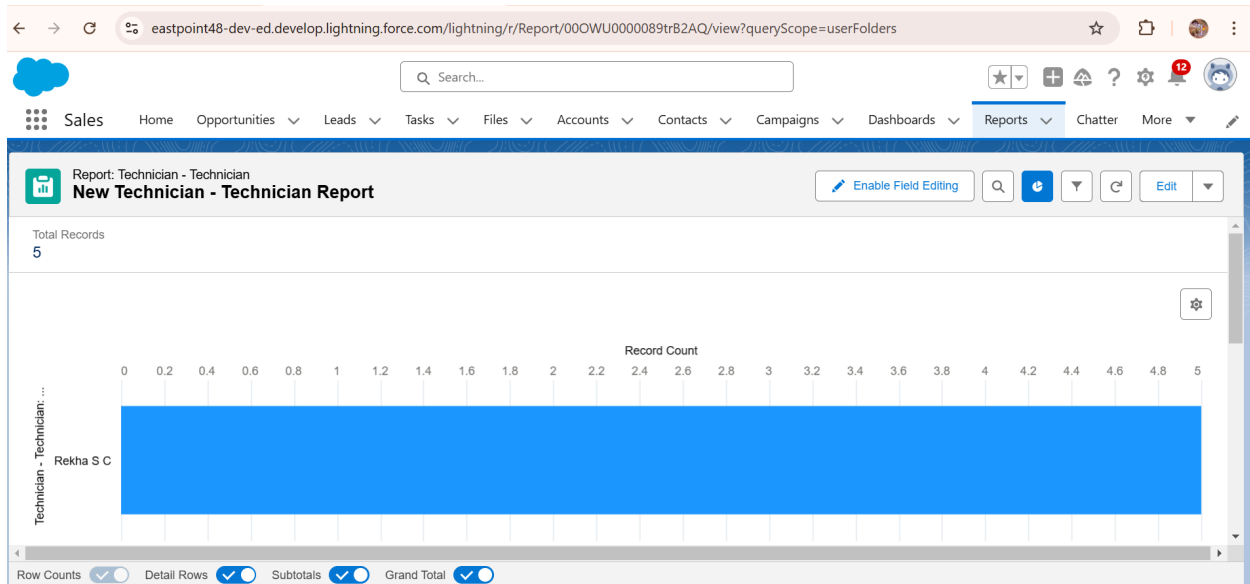
```
1 global class ScheduleClass implements Schedulable {  
2     global void execute(SchedulableContext SC) {  
3         RecordDeletions delrec = new RecordDeletions();  
4         database.executeBatch(delrec, 200);  
5     }  
6 }
```

At the bottom of the console, there is a tab bar with "Logs", "Tests", "Checkpoints", "Query Editor", "View State", "Progress", and "Problems". The "Problems" tab is currently selected, showing a table with columns "Name", "Line", and "Problem". The table is currently empty.

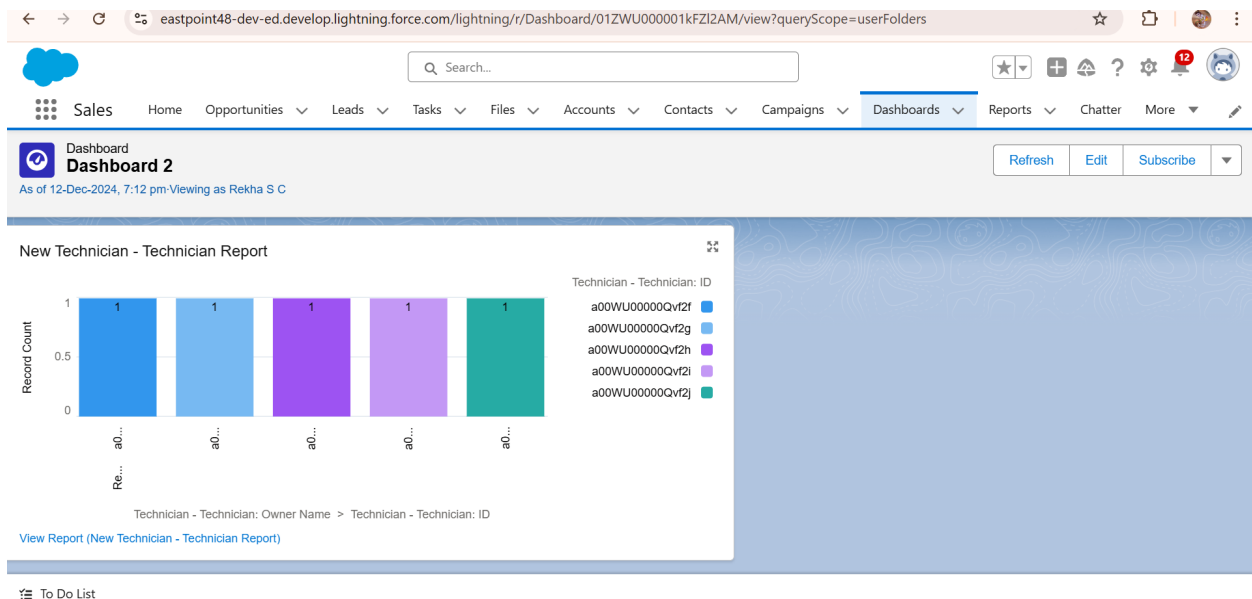
**Create A Schedule Apex :** To schedule an Apex class in Salesforce, go to Setup and search for "Apex Classes" in the Quick Find box. Click on "Schedule Apex." Enter the Job Name as "DeleteAssignmentSchedule," select "ScheduleClass" using the lookup icon for the Apex Class, set the Frequency to "Monthly,"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