FIELD SERVICE WORKORDER OPTIMIZATION Report

Rekha S C

rekhasc49@gmail.com

East point College Of engineering and Technology

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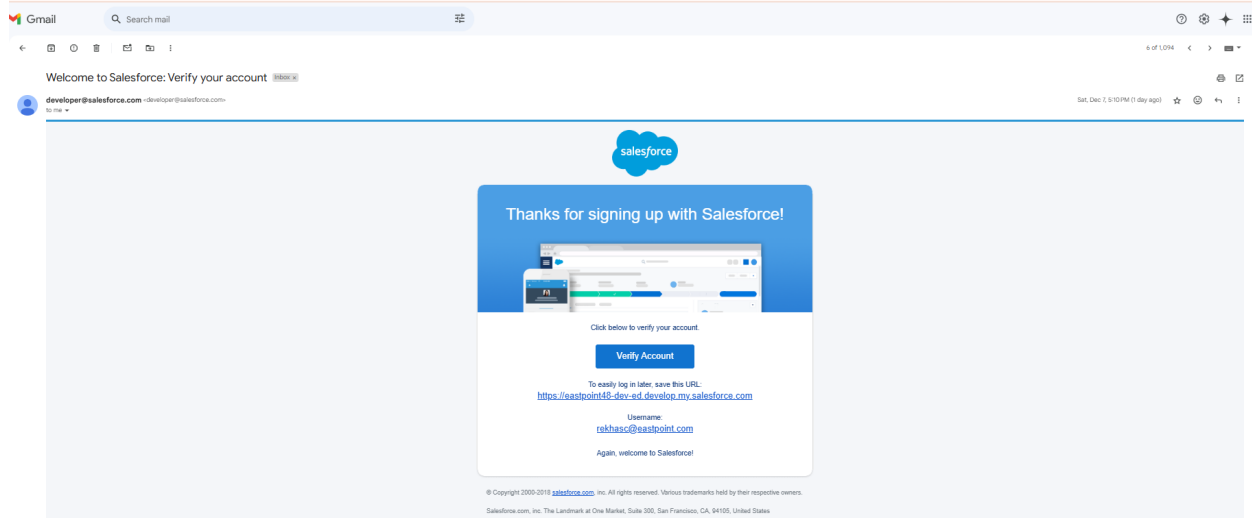
1. **Account Activation :** Then I have got the mail, verifiedmy account, and set up a password.

2.Object

- **Create Technician Object :** After downloading the given Technician spreadsheet, create custom object from spreadsheet, upload the technician.csv file and importthe 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	* Field Labels Row	Import 5 rows of Data?	Record Name Field
Unicode (UTF8)	Comma	○ Enter manually ● Detect from row	1	○ No, skip import ● Yes, import data	Let Salesforce Create a Default Record

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	☑	T-0001
✓	Name	✕	Name	Text	☑	Raghu
✓	Phone	✕	Phone	Phone	☑	7892341560
✓	Email	✕	Email	Email	☑	raghu@gmail.com
✓	Location	✕	Location	Picklist	☑	Hyderabad
✓	Availibility	✕	Availibility	Picklist	☑	Available
✓	Skills	✕	Skills	Picklist	☑	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	* Field Labels Row	Import 2 rows of Data?	Record Name Field
Unicode (UTF8)	Comma	○ Enter manually ● Detect from row	1	● No, skip import ○ Yes, import data	WorkOrder ID

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	☑	WO-{0001}
✓	Email	✕	Email	Email	☑	example1@workorder.com
✓	Service Type	✕	Service Type	Text	☑	Maintenance
✓	Description	✕	Description	Text	☑	
✓	Location	✕	Location	Picklist	☑	Pune
✓	Priority	✕	Priority	Picklist	☑	Low
✓	Status	✕	Status	Picklist	☑	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	Assignment	Example: Account
Plural Label	Assignments	Example: Accounts
Starts with vowel sound	☐	

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

Object Name	Assignment	Example: Account
Description		

Context-Sensitive Help Setting
● Open the standard Salesforce.com Help & Training window
○ Open a window using a Visualforce page

Content Name   --None--

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	Assignment ID	Example: Account Name
Data Type	Auto Number	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	A-{0000}	Example: A-{0000} What Is This?

3.Tabs

Creating a Custom Tab : Select the Tabs optionin Quick find box and create new tab namedAssignment

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 newlightning app with the name of project and some furtherdetails.
   a. Add Navigation Items (i.e, Home, WorkOrder, Assignments, Technician, Reportsand 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.
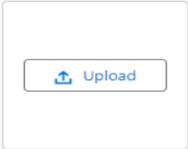
App Details

*App Name ⓘ

Field Service WorkOrder Optimization

*Developer Name ⓘ

Field_Service_WorkOrder_Optimization

Description ⓘ

Give a meaningful description
Image

App Branding

Image ⓘ

Upload

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	
Approval Requests	

▶
◀

Selected Items

🏠 Home	
WorkOrder	
Assignments	
Technician	
Reports	
Dashboards	

▲
▼

FIG 4.2 : Add Navigation Items

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

.

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).

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".

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

Add Assignment Date with Formulawith 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."

7.Users

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

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.


```
trigger AssignmentTrigger on Assignment__c (after insert) {
    if(Trigger.IsAfter && Trigger.IsInsert){
        AssigningEmail.sendEmailmsg(Trigger.New);
    }
}
```

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.

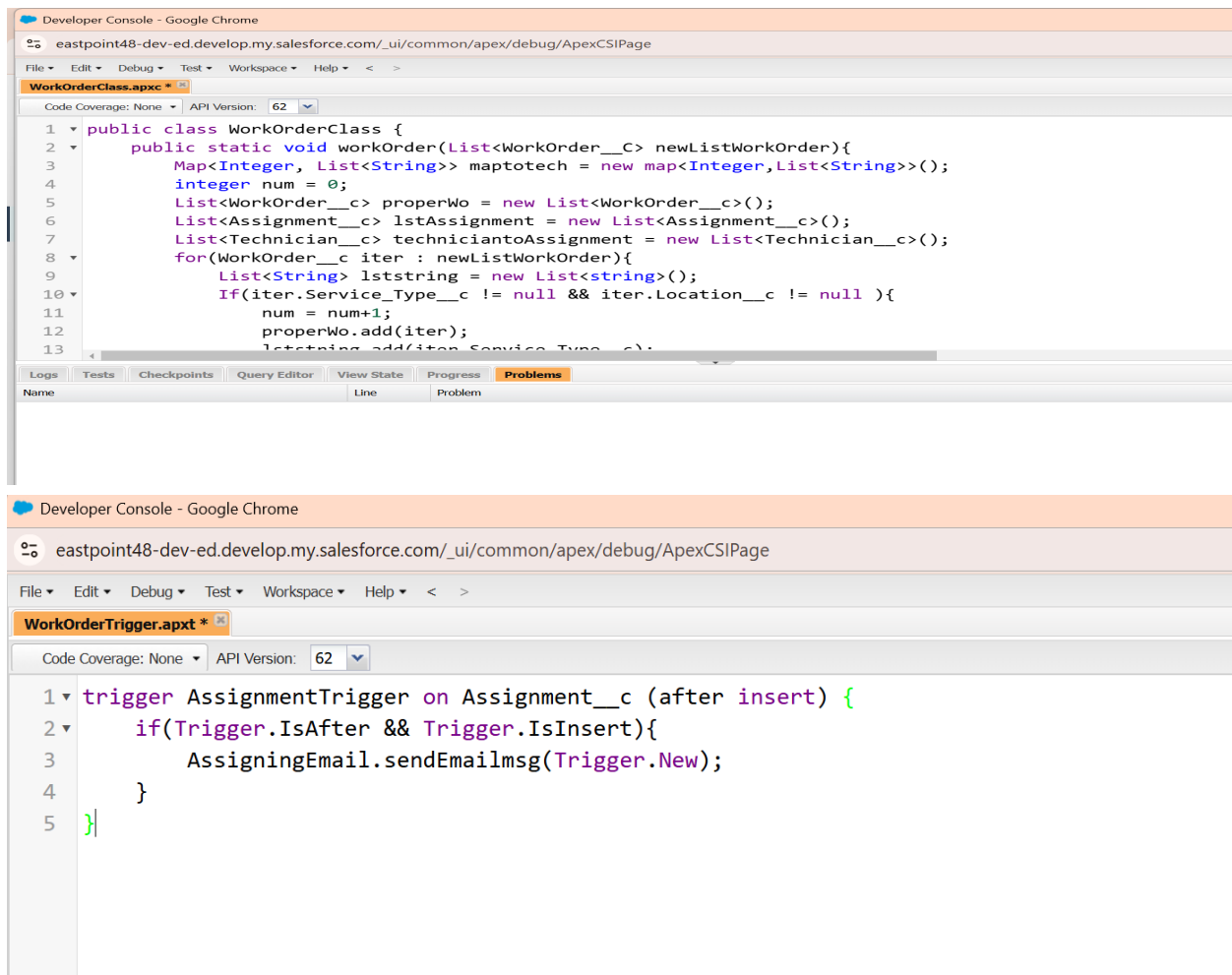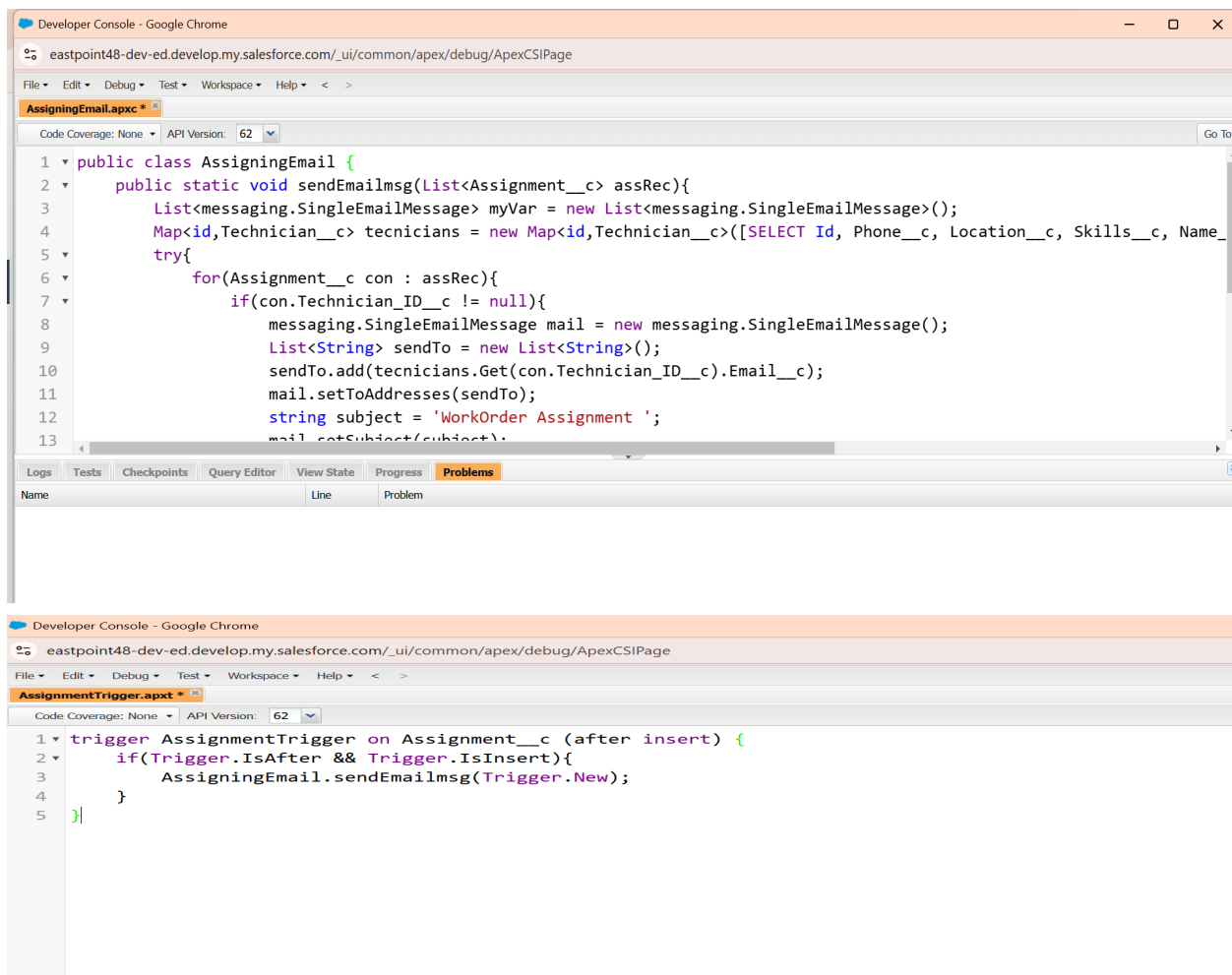**FIG 8.2 Assignment Apex Class and Trigger Code**

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".
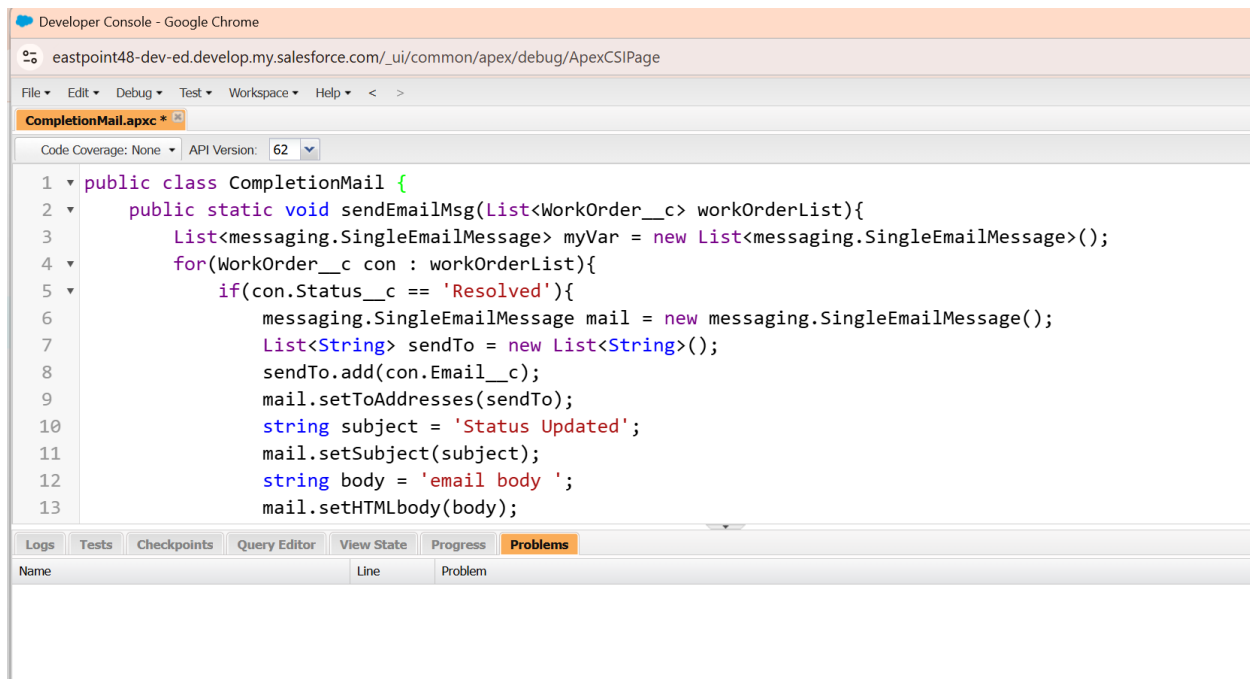
FIG 8.3 Completion Apex Class Code

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
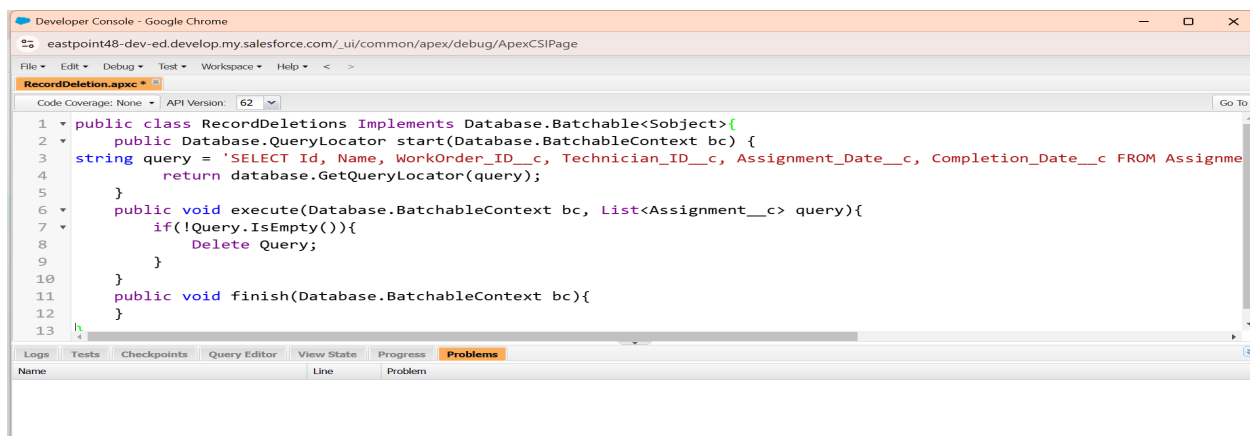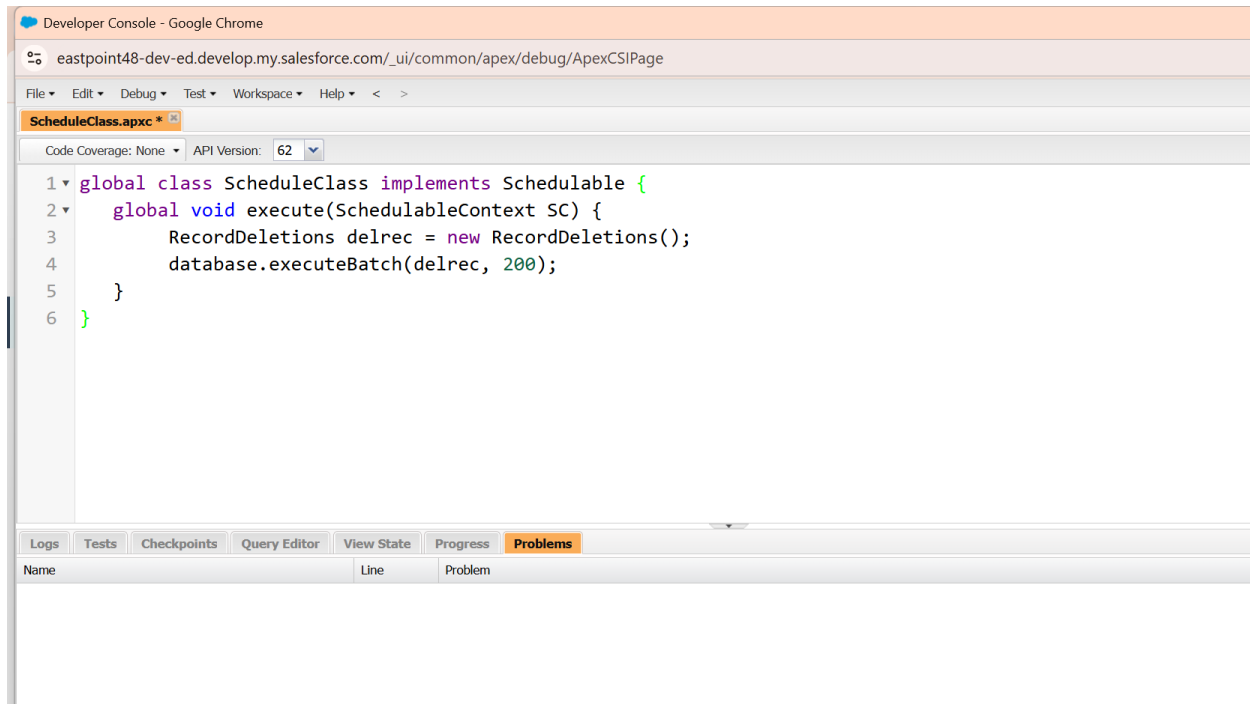
"Schedule" and click "OK."

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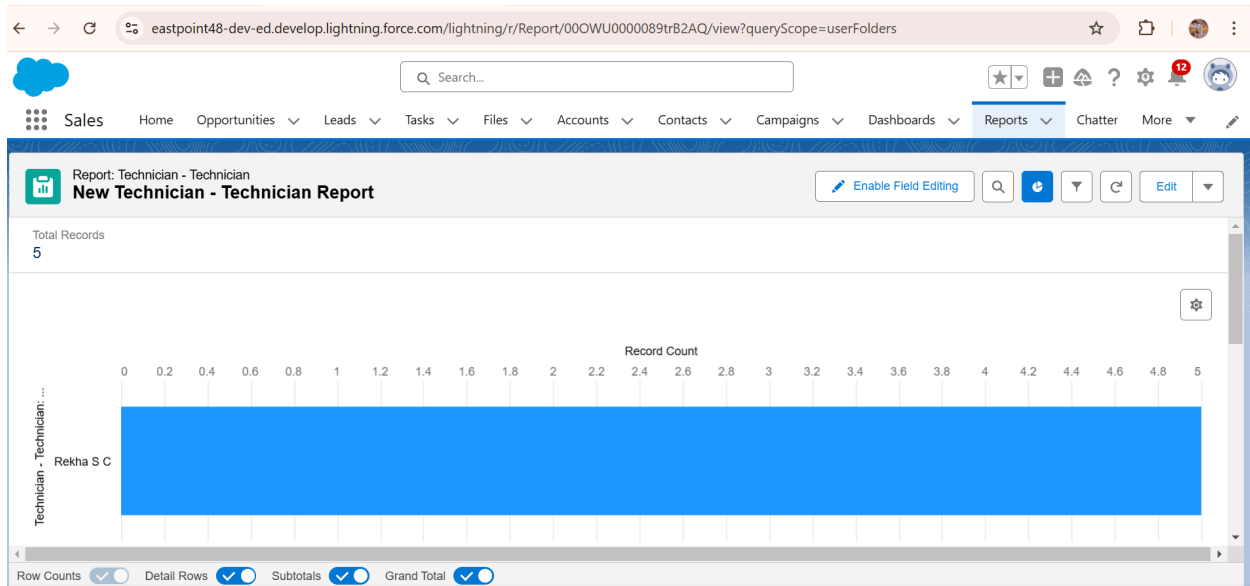
Create Dashboards : To create a dashboard in Salesforce, go to the app and click on the Dashboards tab. Click "New Dashboard," give it a name, and click "Create." Select "Add Component," choose the report you created previously, and click "Select." Click "Add," then "Save," and finally, click "Done"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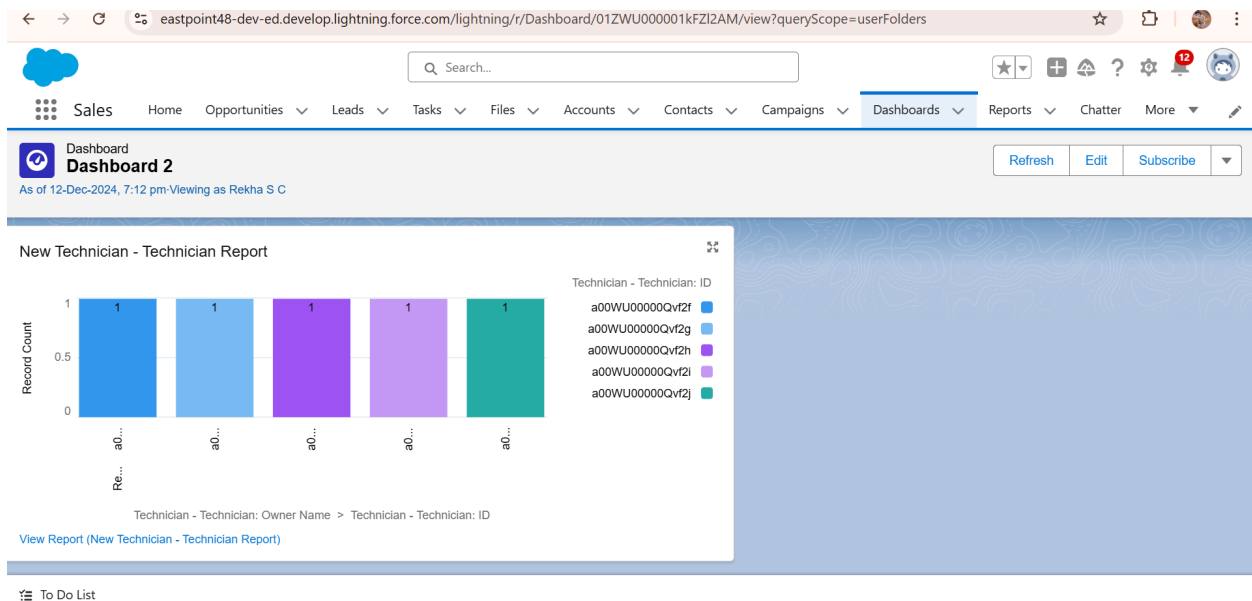

FIG 9.1 Technician and Assignment Details Report Dashboard

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 Adressed

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.