

FIELD SERVICE WORKORDER OPTIMIZATION

Report



BY-

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PROJECT ABSTRACT

The Field Service Workorder Optimization project is designed to improve the efficiency and effectiveness of managing field service operations. By implementing automated scheduling systems, work orders are prioritized and assigned based on technician availability, skill sets, and proximity, reducing both downtime and travel time. Real-time data integration and GPS tracking provide technicians with the most current information and directions, ensuring smooth communication with the back office. Technicians can easily access and update job details through a user-friendly interface, while managers gain insights from dashboards displaying key performance metrics. This optimization not only enhances operational efficiency and lowers costs but also boosts customer satisfaction by ensuring timely, high-quality service. By leveraging technology and data analytics, the project significantly streamlines field service management, leading to better resource utilization and improved service outcomes.

INTRODUCTION

Efficient field service management is essential for organizations striving to deliver prompt, high-quality customer service. The Field Service Workorder Optimization project tackles this challenge by utilizing advanced scheduling algorithms, real-time data integration, and smart resource allocation. In industries where minimizing downtime, reducing travel time, and boosting customer satisfaction are critical, this project aims to optimize the management and execution of work orders. By integrating technology and data-driven strategies, it seeks to modernize traditional field service operations, ensuring efficient resource use and improved service delivery.

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1. Salesforce -

- **Creating Developer Account** : Created a developer organization in salesforce platform by filling all the relevant details.
- **Account Activation** : Then I have got the mail, verified my account, and set up a password.

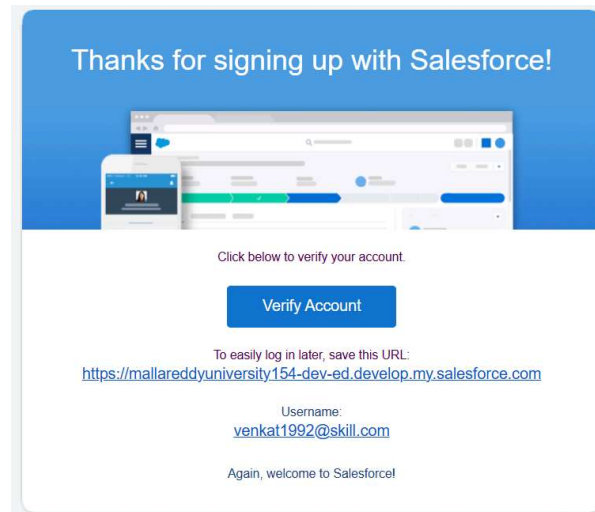


FIG 1.1: Verification Mail

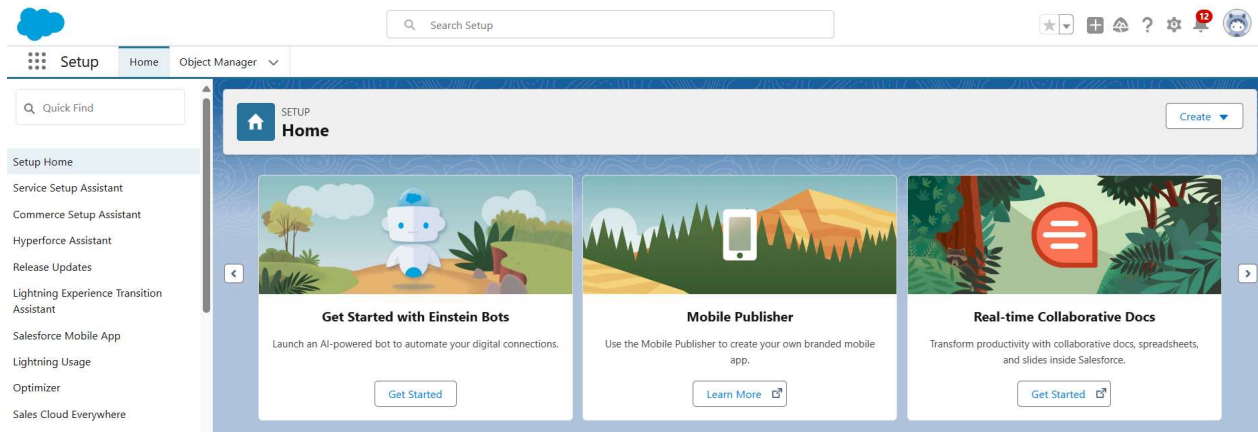


FIG 1.1: Home Page

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 WorkOrder Object** : Same steps to be followed for work order object, here we no need to import the data.
- **Create Assignment Object** : Creating a custom object "Assignment" and enter details, save.

CSV File Details

Encoding Format: Unicode (UTF8) | Values Separated By: Comma | Field Label Source: Detect from row | * Field Labels Row: 1 | Import 5 rows of Data?: Yes, import data | Record Name Field: Technician 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
✓ 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"/>	example@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

CSV File Details

Encoding Format: Unicode (UTF8) | Values Separated By: Comma | Field Label Source: Detect from row | * Field Labels Row: 1 | Import 2 rows of Data?: Yes, import data | Record Name Field: 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	<input checked="" type="checkbox"/>	WO-(0001)
✓ Email	Email	Email	<input checked="" type="checkbox"/>	example1@workorder.com
✓ Service Type	Service Type	Picklist	<input checked="" type="checkbox"/>	Maintenance
✓ Description	Description	Text Area (Long)	<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 WorkOrder Object

Setup | Home | Object Manager

New Custom Object

Custom Object Definition Edit | Save | Save & New | Cancel

Custom Object Information

The singular and plural labels are used in tabs, page layouts, and reports.

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:

Context-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?

Starting Number:

Optional Features

FIG 2.3 : Create Assignment Object

3. Tabs

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

SETUP
Tabs

Edit Custom Object Tab
Assignments

Fill in the fields below to define the custom tab.

Custom Tab Definition Edit

Custom Object Tab Information

Tab Label: Assignments
Object: Assignment
Tab Style: Box
Splash Page Custom Link: --None--

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

Enter a short description.
Description: [Text Area]

Save Cancel

FIG 3.1 : Custom Tab

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

SETUP
Tabs

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.

Custom Object Tabs

Action	Label	Tab Style	Description
Edit Del	Assignments	Box	
Edit Del	Technician	Box	
Edit Del	WorkOrder	Box	

Web Tabs
No Web Tabs have been defined

Visualforce Tabs
No Visualforce Tabs have been defined

Lightning Component Tabs
No Lightning component tabs have been defined

Lightning Page Tabs
No Lightning Page Tabs have been defined

FIG 3.2: Custom tabs List

4. The Lightning App

- **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.
- **Add Navigation Items** (i.e, Home, WorkOrder, Assignments, Technician, Reports & Dashboards)
- **Add User Profile** (i.e, System Administrator)
- Then click **save** and finish

New Lightning App

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 ⓘ
optimizing workorder in field service

App Branding

Image ⓘ

[Clear](#)

Primary Color Hex Value ⓘ

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

App Launcher Preview

Next

FIG 4.1: Create Lightning App

New Lightning App

Available Items

dash

Create

Selected Items

- Home
- WorkOrder
- Assignments
- Technician
- Reports
- Dashboards

Back

Next

FIG 4.2 : Add Navigation Items

New Lightning App

Available Profiles

system

Salesforce API Only System Integrations

Selected Profiles

- System Administrator

Back

Save & Finish

FIG 4.3 Add User Profile

5. Fields & Relationships

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
Search Layouts
List View Button Layout
Restriction Rules
Scoping Rules
Object Access
Triggers

Assignment Custom Field
WorkOrder ID
Back to Assignment

Validation Rules

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

Field Information

Field Label	WorkOrder ID	Object Name	Assignment
Field Name	WorkOrder_ID	Data Type	Lookup
API Name	WorkOrder_ID__c		
Description			
Help Text			
Data Owner			
Field Usage			
Data Sensitivity Level			
Compliance Categorization			
Created By	Veera Venkata Satyanarayana Bandi, 27/10/2024, 7:03 pm	Modified By	Veera Venkata Satyanarayana Bandi, 27/10/2024, 7:03 pm

Lookup Options

Related To: WorkOrder
Related List Label: Assignments
Required: ☐
Child Relationship Name: Assignments
What to do if the lookup record is deleted?: Clear the value of this field.

Lookup Filter
No lookup filters defined.

Validation Rules
No validation rules defined.

FIG 5.1: Lookup WorkOrder

- **Creating Lookup Field** In Assignment Object : In Assignment go to Fields & Relationships and create a new field labeled as WorkOrder and datatype as Lookup.

SETUP > OBJECT MANAGER
WorkOrder

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
Object Access
Triggers

Picklist Options
Restrict picklist to the values defined in the value set: ☒
Controlling Field: [None]

Picklist Values Used
Active and inactive picklist values: 4 (1,000 max)

Field Dependencies
No dependencies defined.

Validation Rules
No validation rules defined.

Values
New | Record | Replace | Printable View | Chart Colors
Delete Selected | Deactivate Selected | Replace Selected

Action	Values	API Name	Default	Chart Colors	Modified By
<input type="checkbox"/> Edit <input type="checkbox"/> Del <input type="checkbox"/> Deactivate	Value1	Value1	<input type="checkbox"/>	Assigned dynamically	Veera Venkata Satyanarayana Bandi, 27/10/2024, 6:58 pm
<input type="checkbox"/> Edit <input type="checkbox"/> Del <input type="checkbox"/> Deactivate	Nasik	Nasik	<input type="checkbox"/>	Assigned dynamically	Veera Venkata Satyanarayana Bandi, 27/10/2024, 7:04 pm
<input type="checkbox"/> Edit <input type="checkbox"/> Del <input type="checkbox"/> Deactivate	Warangal	Warangal	<input type="checkbox"/>	Assigned dynamically	Veera Venkata Satyanarayana Bandi, 27/10/2024, 7:04 pm
<input type="checkbox"/> Edit <input type="checkbox"/> Del <input type="checkbox"/> Deactivate	Nanded	Nanded	<input type="checkbox"/>	Assigned dynamically	Veera Venkata Satyanarayana Bandi, 27/10/2024, 7:04 pm

Inactive Values
No Inactive Values values defined.

Back To Top
Always show me more records per related list

FIG 5.2: Update Location Picklist

- **Manage your Picklist Values** : In Object Manager 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 Service type(i.e, Hardware repair, Troubleshoot/Debugging, Lane-Management).

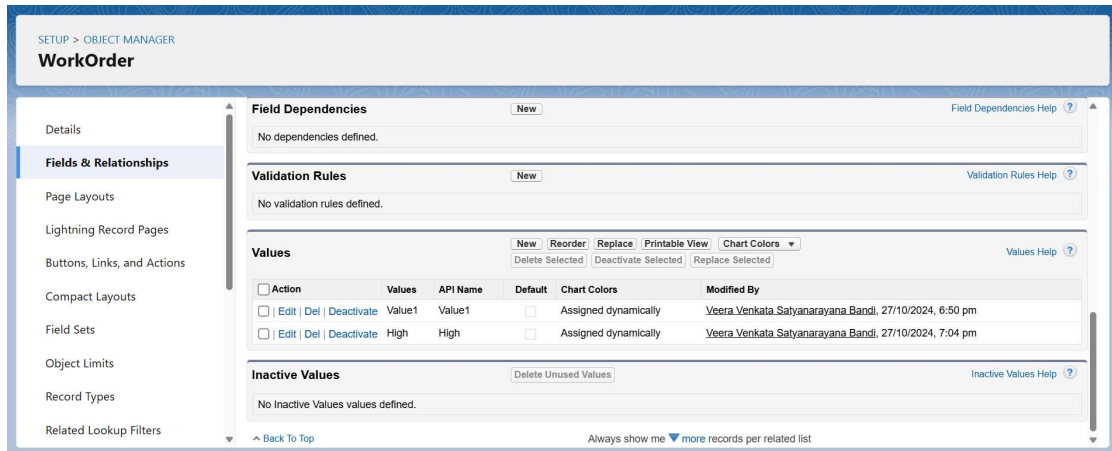


FIG 5.3 Priority Field

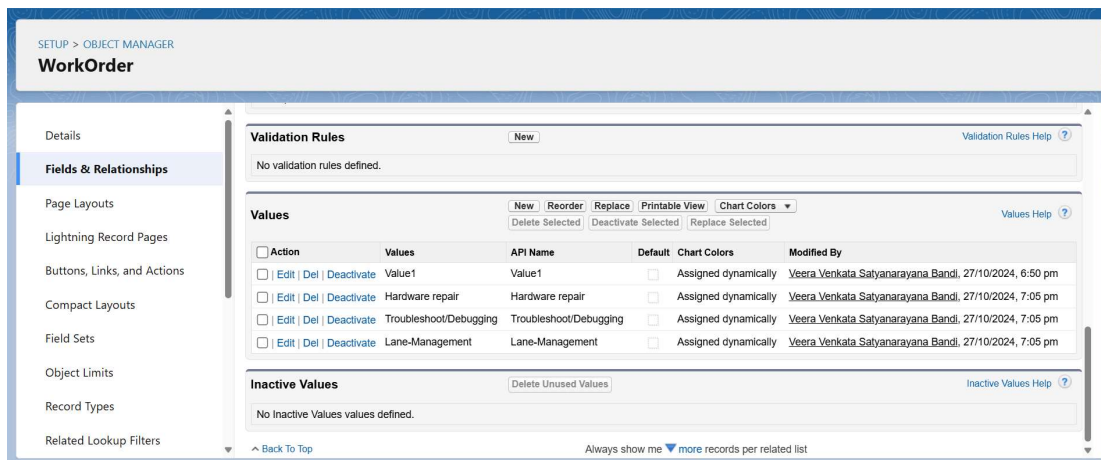


FIG 5.4 Service Type Field

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

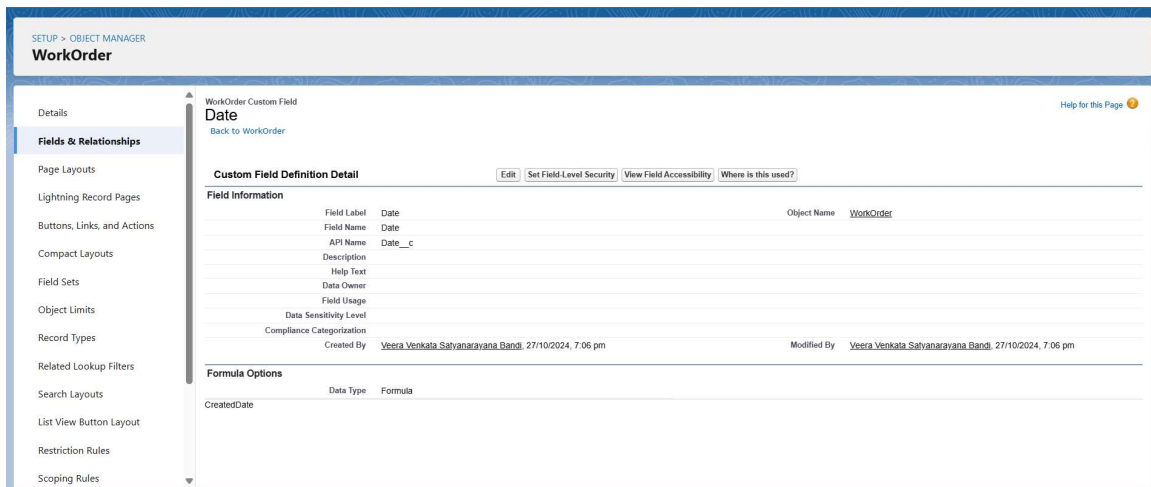


FIG 5.5 Date Formula Field

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

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

Search Layouts

List View Button Layout

Assignment Custom Field
Technician 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	Technician ID	Object Name	Assignment
Field Name	Technician_ID	Data Type	Lookup
API Name	Technician_ID__c		
Description			
Help Text			
Data Owner			
Field Usage			
Data Sensitivity Level			
Compliance Categorization			
Created By	Veera Venkata Satyanarayana Bandi, 27/10/2024, 7:07 pm	Modified By	Veera Venkata Satyanarayana Bandi, 27/10/2024, 7:07 pm

Lookup Options

Related To	Technician	Child Relationship Name	Assignments
Related List Label	Assignments		
Required	<input type="checkbox"/>		

FIG 5.6 Lookup Technecian ID

- Add Assignment Date with Formula with return type date (WorkOrder_ID__r.Date__c).

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

Search Layouts

List View Button Layout

Assignment Custom Field
Assignment Date
[Back to Assignment](#)

Custom Field Definition Detail [Edit](#) [Set Field-Level Security](#) [View Field Accessibility](#) [Where is this used?](#)

Field Information

Field Label	Assignment Date	Object Name	Assignment
Field Name	Assignment_Date		
API Name	Assignment_Date__c		
Description			
Help Text			
Data Owner			
Field Usage			
Data Sensitivity Level			
Compliance Categorization			
Created By	Veera Venkata Satyanarayana Bandi, 27/10/2024, 7:08 pm	Modified By	Veera Venkata Satyanarayana Bandi, 27/10/2024, 7:08 pm

Formula Options

Data Type	Formula
Formula	(WorkOrder_ID__r.Date__c)

FIG 5.7 Formula Assignment Date

- Add Completion Date with Formula with return type date " IF(ISPICKVAL(WorkOrder_ID__r.Status__c , 'Resolved'), WorkOrder_ID__r.LastModifiedDate , NULL)"

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

Search Layouts

Assignment Custom Field
Completion Date
[Back to Assignment](#)

Custom Field Definition Detail [Edit](#) [Set Field-Level Security](#) [View Field Accessibility](#) [Where is this used?](#)

Field Information

Field Label	Completion Date	Object Name	Assignment
Field Name	Completion_Date		
API Name	Completion_Date__c		
Description			
Help Text			
Data Owner			
Field Usage			
Data Sensitivity Level			
Compliance Categorization			
Created By	Veera Venkata Satyanarayana Bandi, 27/10/2024, 7:09 pm	Modified By	Veera Venkata Satyanarayana Bandi, 27/10/2024, 7:09 pm

Formula Options

Data Type	Formula
Formula	IF(ISPICKVAL(WorkOrder_ID__r.Status__c , 'Resolved'), WorkOrder_ID__r.LastModifiedDate , NULL)

FIG 5.8 Formula Completion Date

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 Readonly 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."

The screenshot shows the 'Profile Edit' page for the 'Standard Platform User' profile. The page includes a 'Name' field with 'Standard Platform User' and a 'User License' field with 'Salesforce Platform'. Below these are sections for 'Custom App Settings', 'Service Provider Access', and 'Tab Settings'. The 'Custom App Settings' section contains a table with columns for 'Visible' and 'Default' for various applications.

	Visible	Default
Analytics Studio (standard__Insights)	<input type="checkbox"/>	<input type="radio"/>
App Launcher (standard__AppLauncher)	<input type="checkbox"/>	<input type="radio"/>
Field Service WorkOrder Optimization (Field_Service_WorkOrder_Optimization)	<input type="checkbox"/>	<input type="radio"/>
Platform (standard__Platform)	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>
WDC (standard__Work)	<input type="checkbox"/>	<input type="radio"/>

FIG 6.1 Technecian Profile

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.

The screenshot shows the 'User Edit' page for the user 'Elina Gilbert'. The page includes a 'General Information' section with fields for First Name, Last Name, Alias, Email, Username, Nickname, Title, Company, Department, and Division. It also includes a 'Role' dropdown menu, a 'User License' dropdown menu, a 'Profile' dropdown menu, and a list of checkboxes for various user types.

Field	Value
First Name	Elina
Last Name	Gilbert
Alias	egilb
Email	venkatbandi9030@gmail.cc
Username	elina1234@smart.com
Nickname	eli
Title	
Company	
Department	
Division	
Role	<None Specified>
User License	Salesforce Platform
Profile	Technician
Active	<input checked="" type="checkbox"/>
Marketing User	<input type="checkbox"/>
Offline User	<input type="checkbox"/>
Knowledge User	<input type="checkbox"/>
Flow User	<input type="checkbox"/>
Service Cloud User	<input type="checkbox"/>
Site.com Contributor User	<input type="checkbox"/>
Site.com Publisher User	<input type="checkbox"/>

FIG 7.1 User

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.

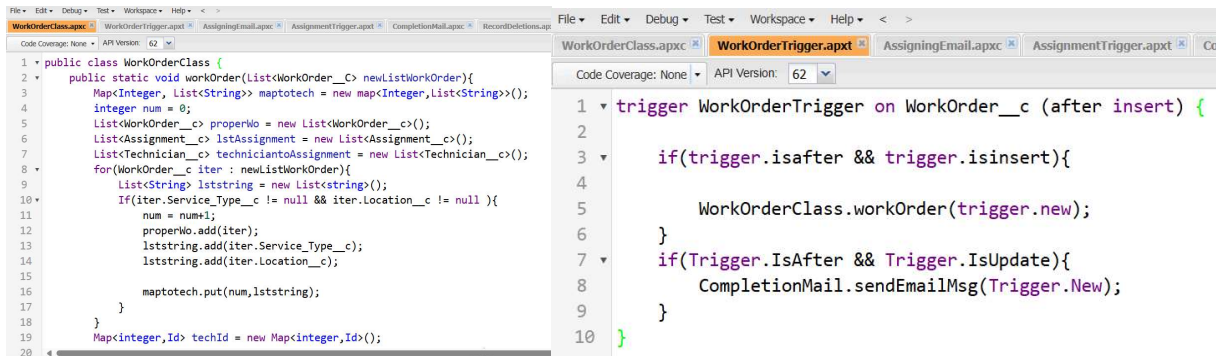


FIG 8.1 WorkOrder Apex Class and Trigger Code

- **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.

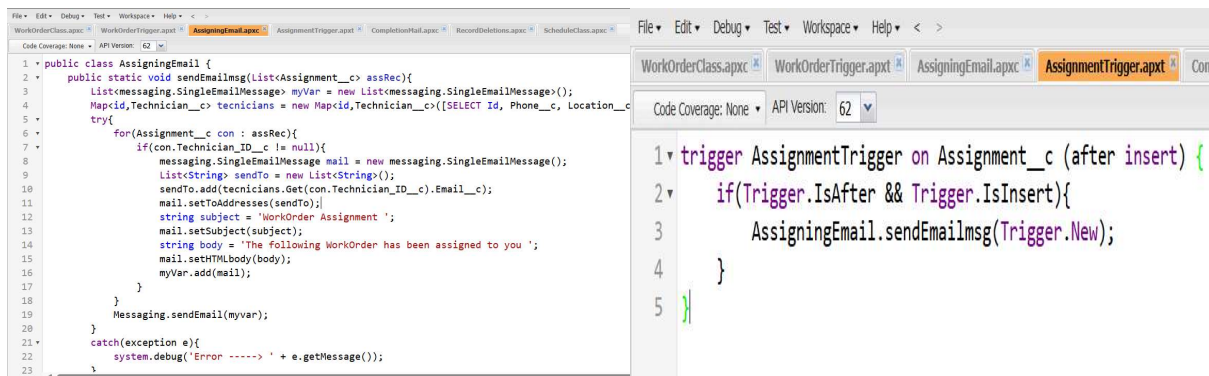
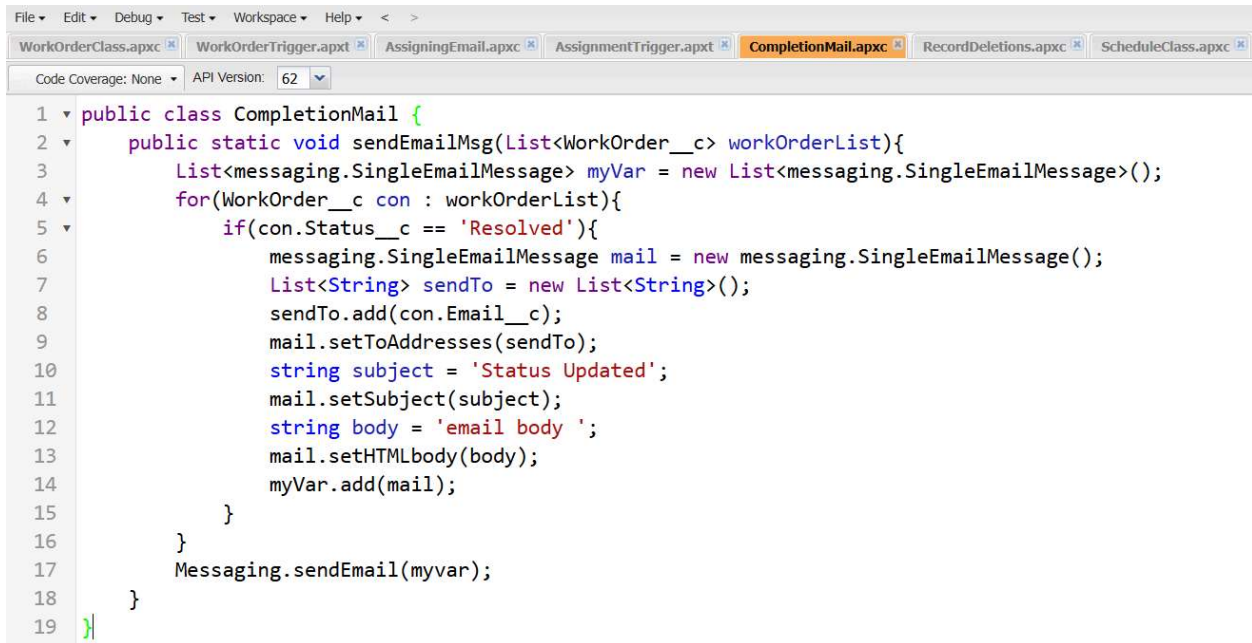


FIG 8.2 Assignment Apex Class and Trigger Code

- **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




```

1 public class CompletionMail {
2     public static void sendEmailMsg(List<WorkOrder__c> workOrderList){
3         List<messaging.SingleEmailMessage> myVar = new List<messaging.SingleEmailMessage>();
4         for(WorkOrder__c con : workOrderList){
5             if(con.Status__c == 'Resolved'){
6                 messaging.SingleEmailMessage mail = new messaging.SingleEmailMessage();
7                 List<String> sendTo = new List<String>();
8                 sendTo.add(con.Email__c);
9                 mail.setToAddresses(sendTo);
10                string subject = 'Status Updated';
11                mail.setSubject(subject);
12                string body = 'email body ';
13                mail.setHTMLbody(body);
14                myVar.add(mail);
15            }
16        }
17        Messaging.sendEmail(myvar);
18    }
19 }

```

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."



```

1 public class RecordDeletions Implements Database.Batchable<Sobjct>{
2
3     public Database.QueryLocator start(Database.BatchableContext bc) {
4
5         string query = 'SELECT Id, Name, WorkOrder_ID__c, Technician_ID__c, Assignment_Date__c, Completion_Date__c FROM Assignment__c WHERE Completion_Date__c <= ' & System.now().getTime() & ' AND Status__c = ' & 'Resolved';
6
7         return database.GetQueryLocator(query);
8     }
9
10    }
11
12    public void execute(Database.BatchableContext bc, List<Assignment__c> query){
13
14        if(!Query.IsEmpty()){
15            Delete Query;
16        }
17    }
18
19 }
20

```

FIG 8.4 RecordDeletion 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."

```

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

```

FIG 8.5 Schedule Apex Class Code

- **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.

- **Created a report type on "WorkOrders Status Reports", "Technician and Assignment Details Reports", "New Assignment with WorkOrder ID Report".**

REPORTS	Report Name	Description	Folder	Created By	Created On	Subscribed
Recent	WorkOrders Status Reports		Private Reports	Veera Venkata Satyanarayana Bandi	27/10/2024, 7:44 pm	
Created by Me	New Assignments with WorkOrder ID Report		Private Reports	Veera Venkata Satyanarayana Bandi	27/10/2024, 7:42 pm	
Private Reports	Technician and Assignment Details Report		Private Reports	Veera Venkata Satyanarayana Bandi	27/10/2024, 7:46 pm	
Public Reports						

FIG 9.1 Report List

- **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.

-Created all three Dashboards on the above Reports.

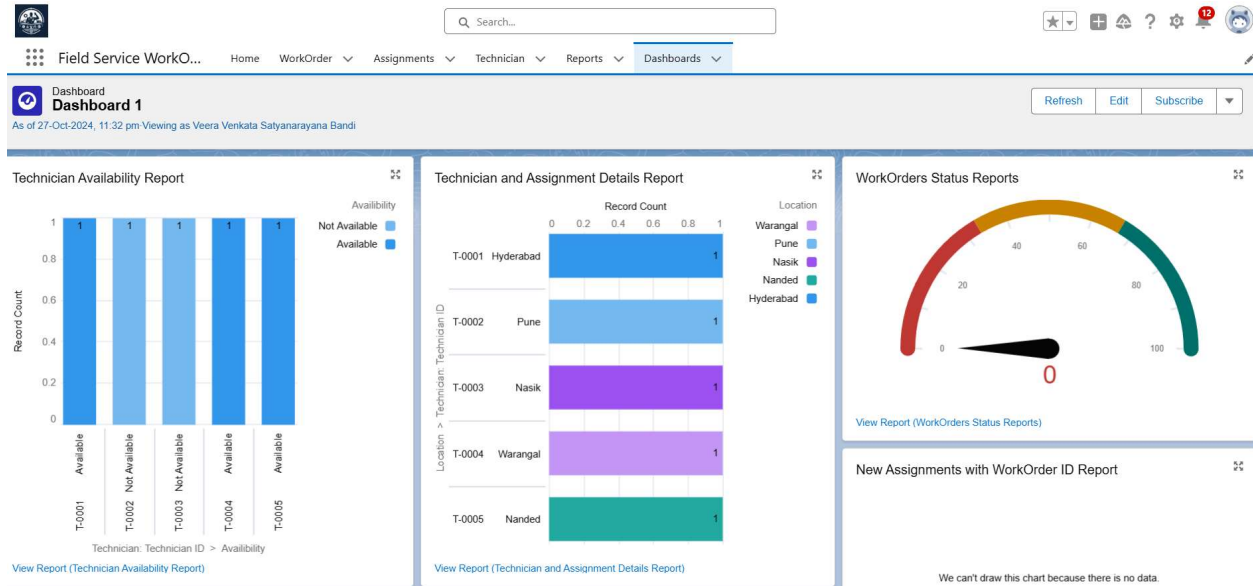


FIG 9.2 Technician and Assignment Details Report Dashboar

Thank You