FIELD SERVICE WORKORDER OPTIMIZATION

Project Title:	Field Service WorkOrder Optimization
College Name:	Ideal Institute of Technology
Team ID:	LTVIP2025TMID31104
Team Size:	4

Team Members Details:

Name	Email ID	Role
Hem Shankar Trinath Pitani	pitanihemanth9@gmail.com	Team Leader
Erothu Venkata Siva Sai	erothusadhivik@gmail.com	Team Member
Doddi Durga Harshith	sridurgaharshith@gmail.com	Team Member
Dadala Gangadhar	bunnygangadhar8@gmail.com	Team Member

1. INTRODUCTION

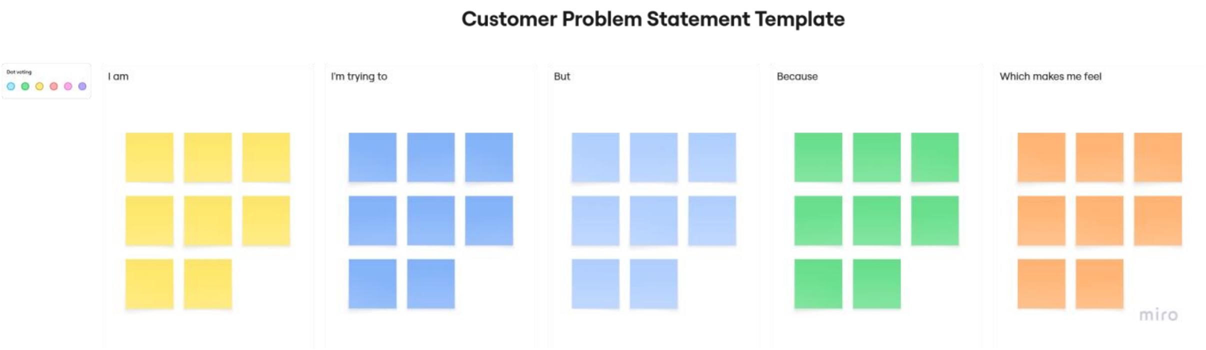
1.1 Project Overview: Field Service WorkOrder Optimization, is built on Salesforce to improve how work orders are assigned and managed. It helps managers assign the right technician automatically and track work progress using custom apps, reports, and automation tools.

1.2 Purpose: The purpose of this project to make field service work faster and easier by automating technician assignments, sending email alerts, and providing reports. This saves time, reduces errors, and keeps both technicians and customers informed.

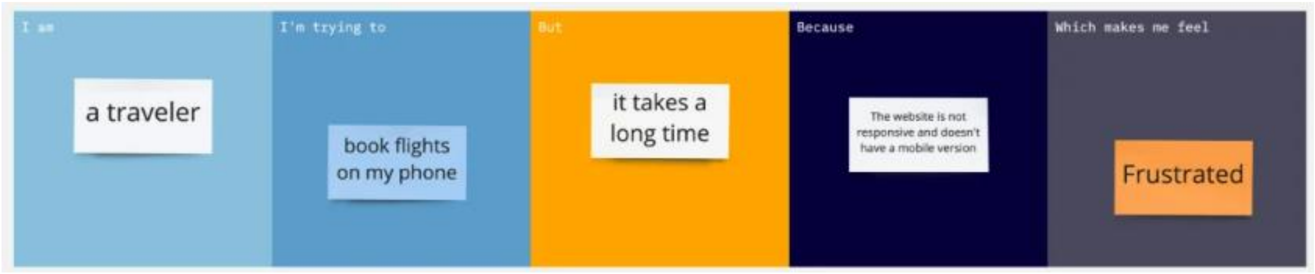
2. IDEATION PHASE

2.1 Problem Statement

Creating a problem statement from the customer's perspective is essential for designing solutions that address their needs. The Customer Problem Statement template helps the team focus on customer challenges in field service work order processes, fostering empathy and enabling the development of solutions that enhance efficiency and satisfaction.



Example:



Problem Statement (PS)	I am (Customer)	I’m trying to	But	Because	Which makes me feel
PS-1	A field service technician	Complete work orders efficiently and on time	I receive work orders with incomplete information or last-minute schedule changes.	The current scheduling system lacks real-time updates and integration with field data.	Frustrated and stressed, as I cannot plan my day effectively or meet customer expectations.
PS-2	A customer awaiting field service	Get timely updates on when a technician will arrive to resolve my issue.	I receive vague or no communication about the technicians arrival time.	The work order system does not provide real-time tracking or automated notifications	Anxious and dissatisfied, as I have to adjust my schedule without clear information.

2.2 Empathy Map Canvas

The Empathy Map Canvas is a visual tool designed to capture insights into the behaviors, attitudes, and needs of users. It enables teams to deeply understand their users, ensuring that solutions are tailored to address real problems from the user’s perspective.

For the Field Service WorkOrder Optimization, our primary users are:

- Field Service Managers
- Field Technicians
- Customers awaiting service

Purpose of empathy mapping

- Gain a deeper understanding of users’ goals, challenges, and behaviors to design an effective work order optimization platform.
- Identify pain points and opportunities to enhance operational efficiency and user satisfaction.
- Align the solution with the needs and workflows of managers, technicians, and customers.

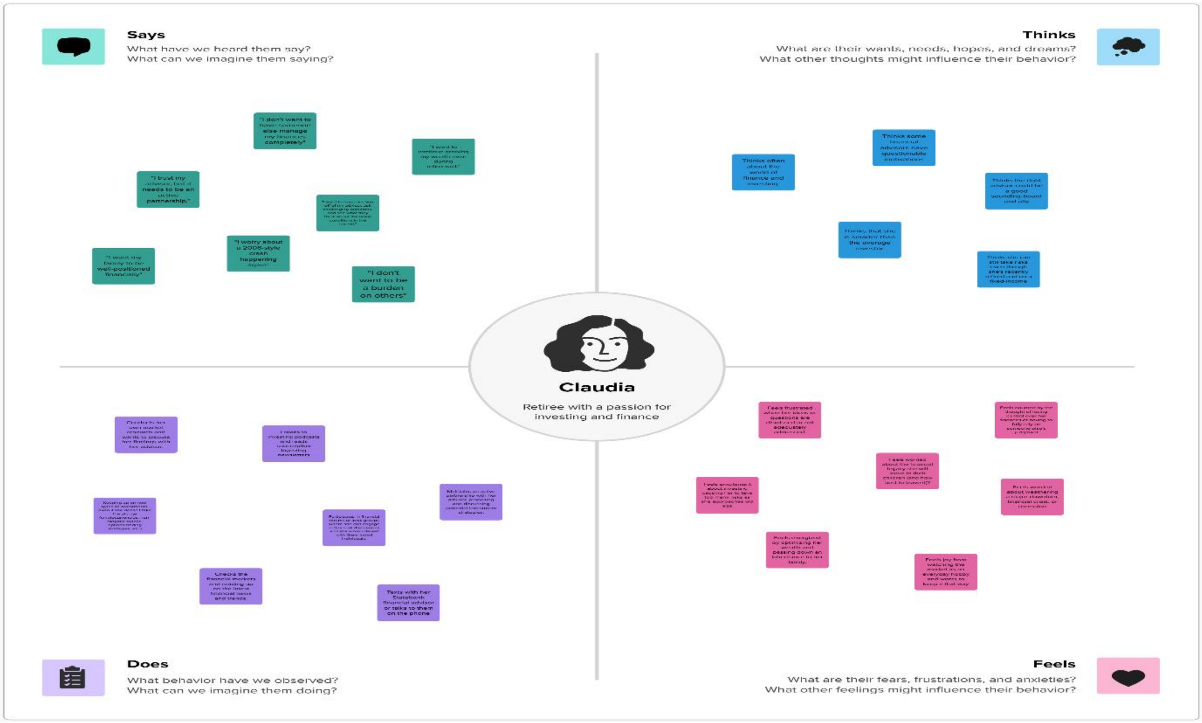
The Empathy Map includes:

Field Service Managers :

- **Pains**: Frustrated by scheduling errors, stressed about meeting KPIs, and overwhelmed by manual processes.
- **Gains**: Desire a system that automates scheduling, provides real-time insights, and reduces customer complaints.
- **Goals**: Improve operational efficiency, reduce costs by 10%, and increase customer satisfaction by 25%.

Field Technicians :

- **Pains**: Frustrated by inefficient workflows, stressed about mismatched assignments, and annoyed by lack of real-time data.
- **Gains**: Want a single, user-friendly app for all job details, clear schedules, and fewer disruptions.
- **Goals**: Complete jobs faster, reduce downtime by 15%, and improve customer interactions.


Says
What have we heard them say?
What can we imagine them saying?
Thinks
What are their wants, needs, hopes, and dreams?
What other thoughts might influence their behavior?
Claudia
Retiree with a passion for investing and finance
Does
What behavior have we observed?
What can we imagine them doing?
Feels
What are their fears, frustrations, and anxieties?
What other feelings might influence their behavior?

2.3 Brainstorming

Brainstorming fosters a collaborative environment where team members can freely contribute creative ideas to optimize field service work order processes. The goal is to prioritize innovative, out-of-the-box solutions that enhance efficiency, reduce costs, and improve customer satisfaction. This template guides your team through the ideation and prioritization process, whether in-person or remote, to develop actionable solutions for work order optimization.

Reference: https://www.mural.co/templates/brainstorm-and-idea-prioritization

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Select the Problem Statement
Documentation Process
Collaboration
Team Gathering

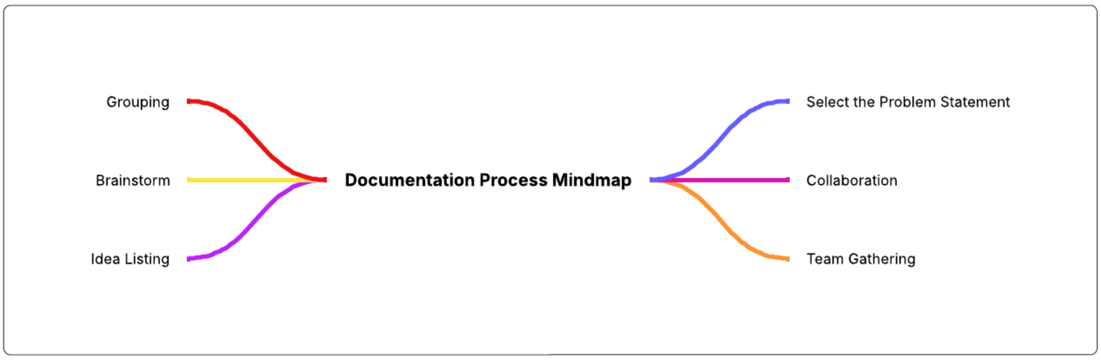
- **Objective**: Assemble the team, define roles, and select a clear problem statement to address inefficiencies in field service work order management.
- **Problem Statement**: Current field service work order processes suffer from delays, miscommunication, and inefficient resource allocation, leading to increased operational costs and reduced customer satisfaction.
- **Activities**:
    - Gather cross-functional team members (e.g., field technicians, dispatchers, IT specialists, and customer service representatives).
    - Use collaborative tools (e.g., Mural, Miro) for virtual or hybrid brainstorming sessions.

    - Define the scope: Optimize scheduling, routing, and task allocation for field service work orders.
    - Assign a facilitator to guide discussions and a scribe to document ideas.

Step-2: Brainstorm, Idea Listing and Grouping

- **Objective:** Generate a high volume of ideas to address the problem statement, then group similar ideas for clarity.
- **Process:**
    - Conduct a 15–20 minute brainstorming session where all ideas are welcome, no matter how unconventional.
    - Use a timer to keep the session focused and encourage rapid idea generation.
    - List ideas on a digital whiteboard or sticky notes (virtual or physical).
    - **Group similar ideas into categories such as:**
        - **Scheduling Optimization**: Automated scheduling, real-time updates
        - **Routing Efficiency**: GPS-based routing, traffic-aware algorithms.
        - **Resource Allocation**: Technician skill matching, inventory management.
        - **Customer Communication**: Automated notifications, customer portals.
        - **Data Analytics**: Predictive maintenance, performance dashboards.

Brainstorming, Idea Listing, and Grouping Mindmap for Documentation



Step-3: Idea Prioritization

- **Objective**: Evaluate and prioritize ideas based on feasibility, impact, and alignment with project goals.
- **Process**:
    - Use a prioritization matrix to score ideas (e.g., Impact vs. Effort or Cost vs. Benefit).
    - Assign scores (1–4) for each idea based on:

- **Impact**: How significantly does it improve efficiency or customer satisfaction? (1 = Low, 4 = High)
- **Feasibility**: How practical is it to implement within 6–12 months? (1 = Difficult, 4 = Easy)
- **Cost**: What is the estimated cost of implementation? (1 = High, 4 = Low)

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

Stage	Customer Action	Customer Experience	System Support (Salesforce)
1. Service Request	Customer raises a service request	Wants quick and clear acknowledgment	WorkOrder created in Salesforce (WorkOrder__c)
2. Waiting	Customer waits for technician assignment	May feel anxious or uncertain	Apex class auto-assigns technician based on skill/location
3. Notification	Receives technician assignment email	Feels informed and confident	Email sent using AssigningEmail class after Assignment creation
4. Service Delivery	Technician visits and resolves issue	Gets service done with minimal delay	Technician record linked with Assignment & WorkOrder updates status
5. Resolution Update	Customer receives resolution email	Feels assured service is completed	CompletionMail class sends email when WorkOrder is marked Resolved
6. Feedback/Closure	Customer may share feedback or close case	Has a complete service experience	WorkOrder reports and dashboards show performance metrics

3.2 Solution Requirement

- The solution requires creating custom Salesforce objects (Technician, WorkOrder, Assignment) and automating technician assignment using Apex triggers and classes.

- It also includes email notifications, reports, dashboards, and scheduled data cleanup for efficient field service management.

Solution Requirements are of two types:

1. Functional Requirements
2. Non-Functional Requirements

Functional Requirements:

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Technician Management	Create Technician Update Technician Delete Technician
FR-2	WorkOrder Creation	Create WorkOrder Set Priority, Service Type, and Location
FR-3	Technician Assignment	Auto-assign Technician based on Skills & Location
FR-4	Email Notifications	Send email on Technician Assignment Send email when WorkOrder is Resolved
FR-5	Status Management	Update WorkOrder Status Set Completion Date
FR-6	Reporting & Dashboard	Generate Reports View Dashboard Metrics

Non-Functional Requirements:

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FR No.	Non-Functional Requirement	Description
NFR-1	Usability	User-friendly interface for managing Technicians and WorkOrders
NFR-2	Security	Role-based access control and secure data handling
NFR-3	Reliability	Consistent and error-free automation of assignments and email alerts
NFR-4	Performance	Quick loading and execution of Apex triggers and reports
NFR-5	Availability	System should be accessible 99.9% of the time during business hours
NFR-6	Scalability	Can support increasing number of WorkOrders and Technicians without degradation

3.3 Data Flow Diagram

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. For this project, the DFD illustrates how work orders are created, processed, assigned to technicians, and how status updates are managed.
DFD Level 0:
1. WorkOrder is created by admin or customer.
2. System checks technician availability and auto-assigns if matched.
3. Assignment is stored and email notification is sent.
4. Technician updates work status.
5. Completed orders are monitored and removed after 30 days via batch process.

User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Admin	Technician Management	FSW-1	As an admin, I can add and manage technician records including location and skill set.	Technician record is created and updated	High	Sprint-1
Admin	WorkOrder Creation	FSW-2	As an admin, I can create work orders with service type, location, and priority.	Work order is visible in the system	High	Sprint-1
System	Auto Assignment	FSW-3	As a system, I want to auto-assign a technician based on availability, skill, and location.	Technician is auto-assigned on creation	High	Sprint-1
Technician	Email Notification	FSW-4	As a technician, I should receive email alerts upon assignment.	Technician receives notification email	Medium	Sprint-2
Technician	Status Update	FSW-5	As a technician, I can update the status of work orders.	Work order status changes to In-progress/Resolved	High	Sprint-2
Manager	Dashboard	FSW-6	As a manager, I can view work order stats in dashboards.	Dashboard displays current status metrics	Medium	Sprint-2

3.4 Technology Stack

The solution is developed on the Salesforce cloud platform, which includes a Lightning user interface, Apex-based backend logic, and standard Salesforce cloud infrastructure. It enables automatic assignment of field technicians for service requests based on criteria like skill set, availability, and location. External email APIs and Apex triggers handle.

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1	User Interface	Users interact with system through Salesforce Lightning Experience	Salesforce Lightning, HTML
2	Application Logic-1	Custom logic for assignment and notifications	Apex Classes & Triggers
3	Application Logic-2	Auto-scheduling & batch job for data clean-up	Apex Batch & Scheduler
4	Database	Stores WorkOrders, Technicians, Assignments	Salesforce Custom Objects
5	Cloud Database	Hosted on Salesforce infrastructure	Salesforce Cloud
6	File Storage	Stores metadata and attachments	Salesforce File Storage
7	External API-1	Send email alerts for assignment	Salesforce Messaging API
8	Infrastructure (Server / Cloud)	Application hosted in the cloud	Salesforce Platform (Cloud)

Table-2: Application Characteristics:

S.No	Characteristics	Technology
1	Open-Source Frameworks	Salesforce Lightning Framework, Apex (proprietary but extensible)
2	Security Implementations	Field-level security, role-based access control, and encrypted communication
3	Scalable Architecture	Cloud-based architecture with multi-tenant scalability on Salesforce
4	Availability	Hosted on Salesforce Cloud with 99.9% SLA
5	Performance	Uses optimized triggers and batch jobs for bulk processing and high-speed execution

4. PROJECT DESIGN

4.1 Problem Solution Fit Field service teams face delays and errors due to manual work order assignment and lack of real-time updates. This project solves the problem by automating technician assignment, sending email alerts, and providing dashboards for better tracking and faster service delivery.

Problem–Solution Fit means you have:

1. Field service operations face delays due to manual technician assignment and lack of real-time updates.
2. Technicians and customers are often not informed promptly, causing poor service experiences.

The Problem-Solution Fit for Field Service Work Order Optimization focuses on identifying critical challenges faced by field service operations and ensuring the proposed solution effectively addresses these issues. It enables businesses to align technological solutions with customer and operational needs, enhancing efficiency and adoption. The template helps identify behavioral patterns, optimize workflows, and improve communication strategies to solve urgent, frequent, or costly problems in field service management.
Purpose:

Field service teams face operational inefficiencies due to:

- Manual work order assignment
- Unoptimized technician scheduling
- Poor visibility into service status
- Communication delays between technicians and management

- Lack of automation in technician notifications and work tracking

These lead to:

- Increased service delays
- Low technician productivity
- Poor customer satisfaction

Implement a custom Salesforce solution using:

- **Custom Objects:** Technician, WorkOrder, Assignment
- **Automated Workflows:** Apex triggers/classes for auto-assignment and email notifications
- **Lightning App Interface:** Centralized access to WorkOrders and Assignments
- **Reports & Dashboards:** Real-time insights into technician performance and work order status
- **Scheduled Apex Jobs:** Periodic cleanup of outdated assignment

Pain Point	Solution Feature
Manual technician assignment	Apex Trigger + Class (WorkOrderTrigger, WorkOrderClass)
No notifications to technicians	AssigningEmail class with AssignmentTrigger
No customer update after resolution	CompletionMail class in WorkOrderTrigger
Unmanaged old data	Batch + Scheduled Apex (RecordDeletions, ScheduleClass)
No analytics	Custom Reports and Dashboards in Lightning App

Why Problem–Solution Fit is Important

- It ensures the solution you're building actually solves a real, frequent, and painful problem.
- It helps avoid wasting time and resources on features that users don’t need.
- It increases adoption by aligning with how users already work (e.g., email alerts, mobile access).
- It builds trust among stakeholders by delivering clear, useful results—like faster technician assignments and better tracking.
- For your project, it proves that automating field service tasks solves real issues and improves efficiency.

- **Example:**

  In field service operations, managers used to manually assign technicians, which caused delays and errors. Your Salesforce solution automatically assigns technicians based on their skills and availability. This directly solves the problem, saves time, and improves customer satisfaction — proving a strong problem–solution fit.

Problem–Solution Fit Checklist:

- Is the problem frequent, urgent, or costly?
- Is the problem clearly defined?
- Is the solution directly addressing the problem?
- Does the solution align with user behavior?
- can the solution scale with business growth?

4.2 Proposed Solution

The project team shall fill the following information in the proposed solution template to outline the Field Service WorkOrder Optimization project, addressing inefficiencies in work order management and enhancing operational efficiency.

Problem to Be Solved

- Manual assignment of work orders leads to delays and errors
- Technician skills, availability, and location are not considered in assignment decisions
- Slow and inefficient scheduling causes delayed service delivery
- Technicians and customers are not notified promptly about updates or assignments
- Managers lack real-time visibility into work order progress and technician status
- Old and completed records are not cleaned up, cluttering the system
- Poor communication and tracking lead to reduced customer satisfaction

Solution Description

The solution is a Salesforce-based system designed to automate and streamline field service operations. It uses custom objects (Technician, WorkOrder, Assignment) along with Apex triggers and classes to automatically assign technicians based on skill, location, and availability. Email notifications are sent to both technicians and customers for real-time communication. Managers can track progress using reports and dashboards, and outdated records are cleaned using scheduled Apex jobs. This ensures faster service, fewer errors, and improved satisfaction for all users involved.

S.No.	Parameter	Description
1	Problem Statement (Problem to be solved)	Manual allocation of field service technicians leads to delays, errors, and inefficient service. There is a need for an automated system that intelligently assigns technicians based on skills, location, and availability to handle service work orders efficiently.
2	Idea / Solution description	The project provides a Salesforce-based solution that automates work order creation, technician assignment, and notification processes. It utilizes custom objects (Technician, WorkOrder, Assignment), Apex logic, and automation tools to dynamically assign the most suitable technician to each work order. Additionally, it includes scheduled cleanup of outdated records and real-time dashboards for tracking performance.
3	Novelty / Uniqueness	The solution intelligently maps technicians to work orders using logic that matches skillsets, location, and availability—minimizing manual intervention. Real-time email notifications, automatic data clean-up via Apex Scheduler, and dynamic dashboards provide a comprehensive field service management experience within Salesforce.
4	Social Impact / Customer Satisfaction	Faster and more accurate technician assignment leads to quicker issue resolution and improved customer satisfaction. It reduces manual errors and increases accountability. Technicians receive timely assignments and updates, enhancing their productivity.
5	Business Model (Revenue Model)	The solution can be offered as a Salesforce app or consulting service to organizations with large field teams (telecom, utilities, IT services). Revenue can be generated through licensing, subscription, or one-time implementation fees.
6	Scalability of the Solution	Built on the Salesforce platform, the solution is scalable to handle large volumes of work orders and technician records. Additional features such as route optimization, mobile support, or AI-driven dispatching can be integrated to enhance functionality.

4.3 Solution Architecture

- Salesforce Developer Org

The **Solution Architecture** for the Field Service WorkOrder Optimization project is designed to address key inefficiencies in field service management—especially around technician assignment, scheduling delays, and communication gaps. It utilizes Salesforce's customizable platform, automation tools, and reporting capabilities to build a scalable, cloud-native solution.

- Automate and optimize technician assignment based on skills, availability, and location
- Provide real-time visibility into work order status for stakeholders
- Improve operational efficiency using Apex triggers, workflows, and batch jobs
- Enable technician and customer communication through automated email notifications
- Create insightful dashboards and reports for monitoring service performance

Architecture Overview:

This project uses **Salesforce** as a centralized cloud platform. The system architecture includes:

- **Custom Objects:** Technician, WorkOrder, Assignment
- **Lightning App:** Unified interface for managers to view/manage assignments

- **Apex Classes & Triggers:**
  - WorkOrderClass for auto-assignment logic
  - AssigningEmail to notify technicians
  - CompletionMail to notify customers upon resolution
- **Batch Apex & Scheduled Class:**
  - Record Deletions to clean old records
  - ScheduleClass for monthly cleanup
- **Reports & Dashboards:**
  - Technician performance, WorkOrder completion, and status tracking

Features:

Automated Technician Assignment	Improves dispatch efficiency and reduces manual errors
Email Alerts to Technicians & Customers	Enhances communication and satisfaction
Scheduled Data Cleanup	Ensures system remains optimized and clutter-free
Reports & Dashboards	Provides operational insights and tracks KPIs
Custom App Interface	Easy navigation and usability for admin and technicians

Example - Solution Architecture Diagram:

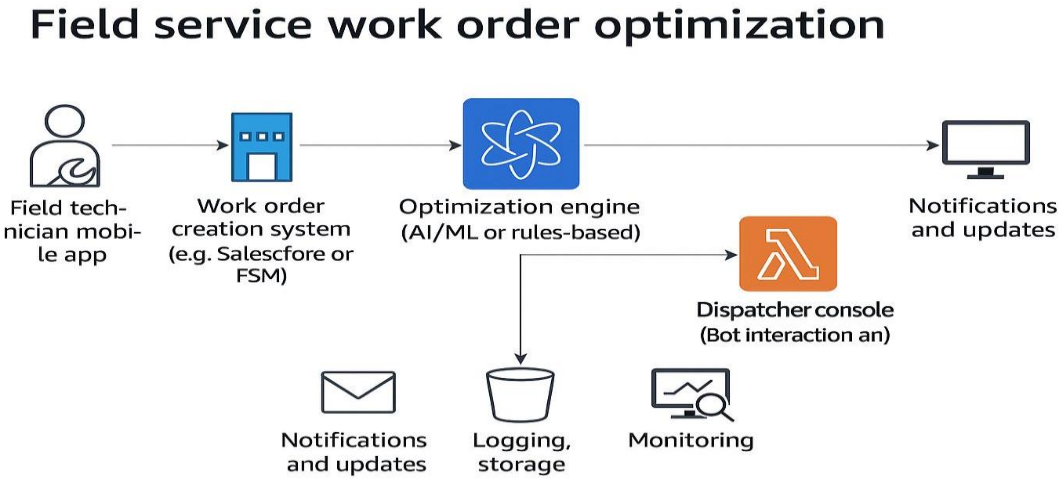

Field service work order optimization
Field tech-nician mobi-le app
Work order creation system (e.g. Salescfore or FSM)
Optimization engine (AI/ML or rules-based)
Notifications and updates
Dispatcher console (Bot interaction an)
Notifications and updates
Logging, storage
Monitoring

Figure 1: Architecture and data flow of the voice patient diary sample application

4.3.1. Architecture Layers

Layer	Components / Technologies
Presentation Layer	Lightning App, Tabs (WorkOrder, Technician, Assignment), Reports & Dashboards
Business Logic Layer	Apex Classes (WorkOrderClass, AssigningEmail, CompletionMail), Triggers (WorkOrderTrigger, AssignmentTrigger)
Data Access Layer	SOQL Queries, Custom Object Relationships (Lookup Fields), Formula Fields
Data Layer	Custom Objects: Technician, WorkOrder, Assignment; Standard Object: User
Integration Layer	Email Messaging via Apex (Messaging.sendEmail), Scheduled Jobs (Apex Scheduler)

4.3.2. Key Components

- Technician (Custom Object)
- WorkOrder (Custom Object)
- Assignment (Custom Object)
- Lightning App
- WorkOrderClass (Apex Class)
- AssigningEmail (Apex Class)
- CompletionMail (Apex Class)
- RecordDeletions (Apex Class)
- ScheduleClass (Apex Class)
- WorkOrderTrigger (Apex Trigger)
- AssignmentTrigger (Apex Trigger)
- Lookup Fields
- Formula Fields
- Technician Profile
- Reports
- Dashboards
- Email Notifications
- Batch Job
- Scheduled Apex

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

- **Week 1**: Salesforce Setup, Creation of Technician, WorkOrder, and Assignment Objects with Fields
- **Week 2**: Tabs, Lightning App, Page Layouts, Picklists, and Email Templates
- **Week 3**: Validation Rules, Formula Fields, Lookup Relationships, Process Automations
- **Week 4**: Apex Triggers & Classes, Testing (UAT), Reports, Dashboards, and Final Documentation

Project Objectives

- Automate the field service work order assignment lifecycle
- Improve technician allocation efficiency and work order transparency
- Minimize manual assignment work through automation and triggers
- Deliver a scalable, secure, and user-friendly Salesforce Lightning solution

Project Scope

In Scope:

- Work order creation, status updates, and technician assignments
- Location and skill-based technician mapping

- Email notifications for assignments and completions
- Role-based access through custom profiles (Technician)
- Reports and dashboards on technician performance and work status
- Scheduled cleanup of completed assignments

Out of Scope:

- Integration with third-party dispatching or GPS systems
- Payment gateway or billing system integrations

Milestones and Deliverables:

Milestone	**Description**	**Duration**
Requirement Gathering	Identify user needs, technician workflow, and assignment logic	2 Days
Design Phase	Create ERD, architecture diagrams, and wireframes	2 Days
Development Phase	Create custom objects, fields, triggers, automation flows	5 Days
Testing Phase	Perform functional, unit, and UAT testing	2 Days
Deployment & Training	Deploy to production and train users/admins	1 Day
Project Documentation	Prepare and finalize all project-related documents	1 Day

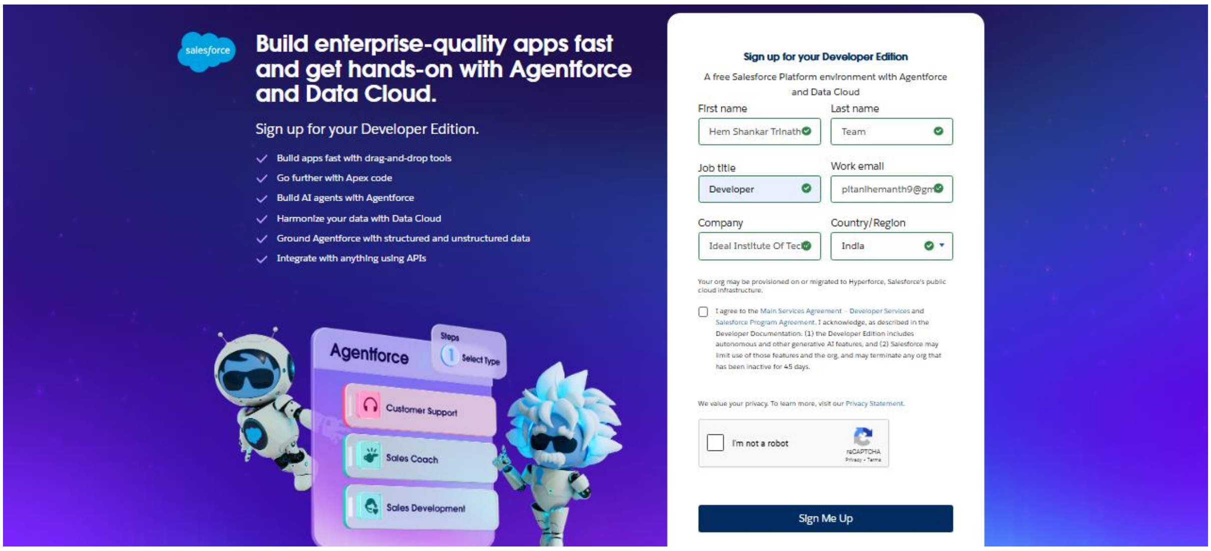
Tools and Technologies Used

- Project Management Tools: Trello / Excel / Salesforce Agile Accelerator
- Development Platform: Salesforce Lightning Platform
- Version Control: Salesforce Change Sets
- Communication: Email, Zoom (for stakeholder meetings)
- Documentation: Microsoft Word, PowerPoint

6. PROJECT DEVELOPMENT PHASE

6.1 Development Activities

- Created Developer Org and set up objects: Technician, WorkOrder, Assignment



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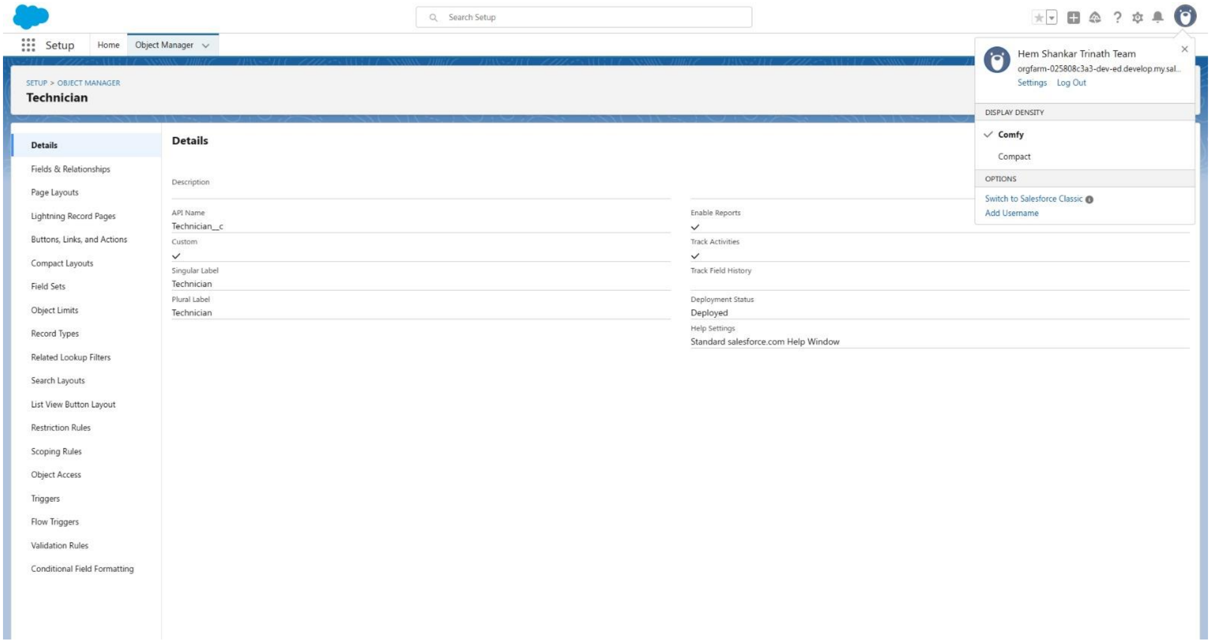
Technician Object:



Technician

Hem Shankar Trinath Team
orgfarm-025808c3a3-dev-ed.develop.my.sal...

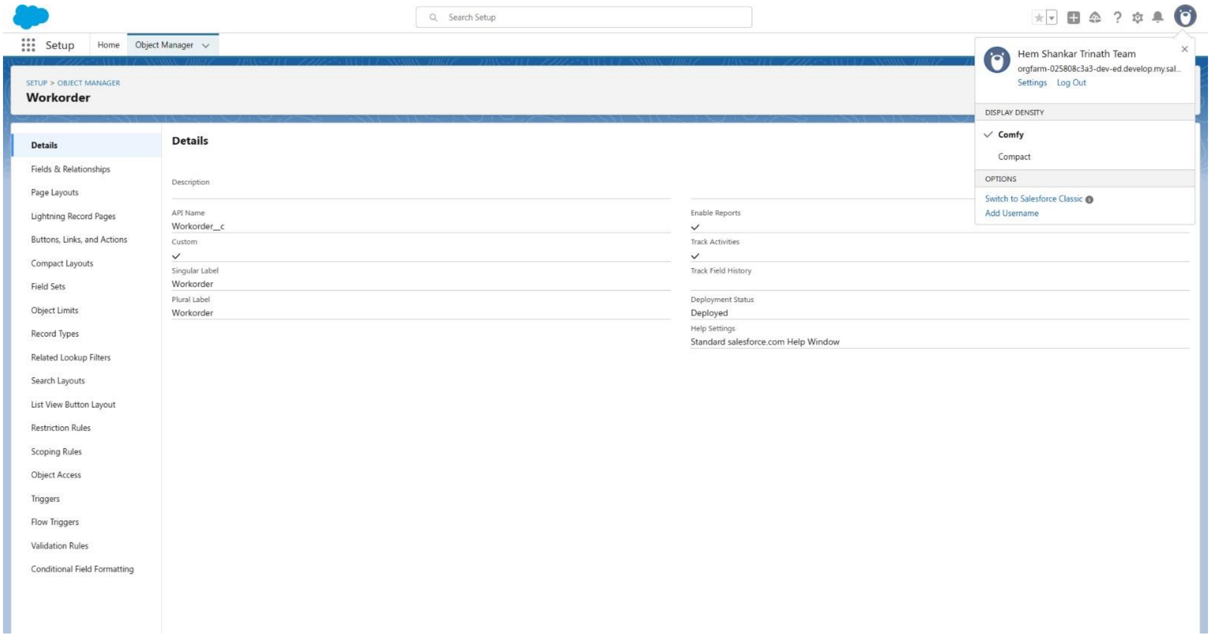
Details

Description

API Name: Technician__c
Custom: ✓
Singular Label: Technician
Plural Label: Technician

Enable Reports: ✓
Track Activities: ✓
Track Field History
Deployment Status: Deployed
Help Settings: Standard salesforce.com Help Window

Workorder Object:



SETUP > OBJECT MANAGER

Workorder

Hem Shankar Trinath Team
orgfarm-025808c3a3-dev-ed.develop.my.sal...

Details

Description

API Name
Workorder__c

Custom
✓

Singular Label
Workorder

Plural Label
Workorder

Enable Reports
✓

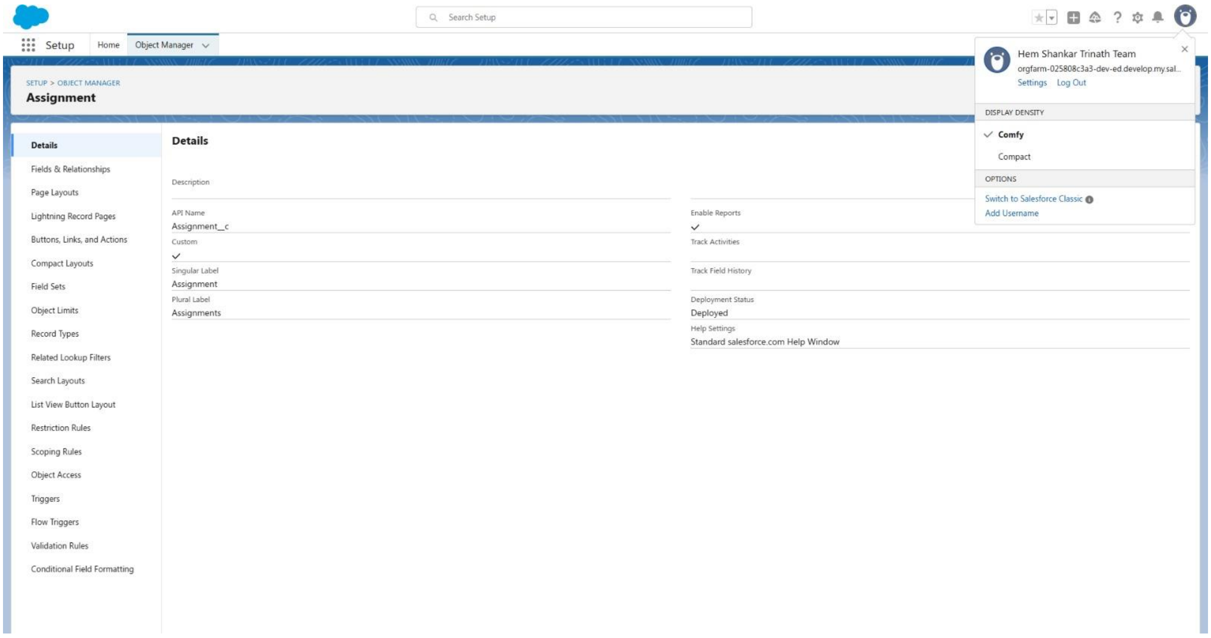
Track Activities
✓

Track Field History

Deployment Status
Deployed

Help Settings
Standard salesforce.com Help Window

AssignmentObject:



SETUP > OBJECT MANAGER

Assignment

Hem Shankar Trinath Team
orgfarm-025808c3a3-dev-ed.develop.my.sal...

Details

Description

API Name
Assignment__c

Custom
✓

Singular Label
Assignment

Plural Label
Assignments

Enable Reports
✓

Track Activities

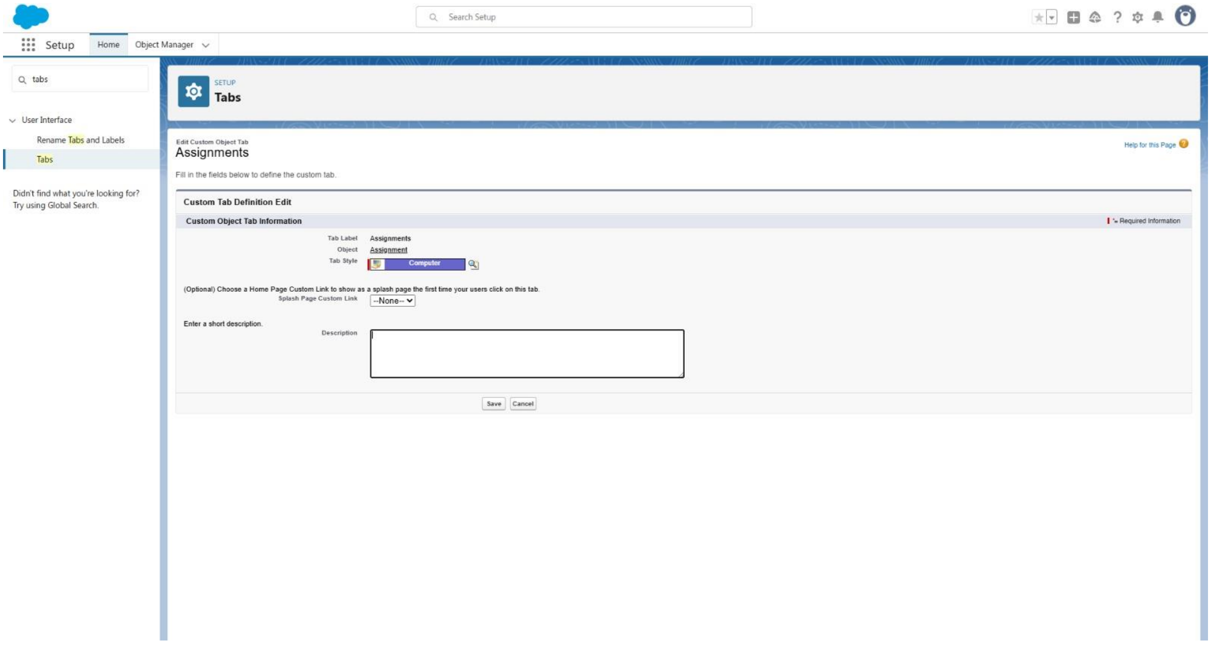
Track Field History

Deployment Status
Deployed

Help Settings
Standard salesforce.com Help Window

- Designed tabs and Lightning App for navigation and UI

Assignment Tab:



Edit Custom Object Tab

Assignments

Fill in the fields below to define the custom tab.

Custom Tab Definition Edit

Custom Object Tab Information | = Required Information

Tab Label: Assignments

Object: Assignment

Tab Style: Computer

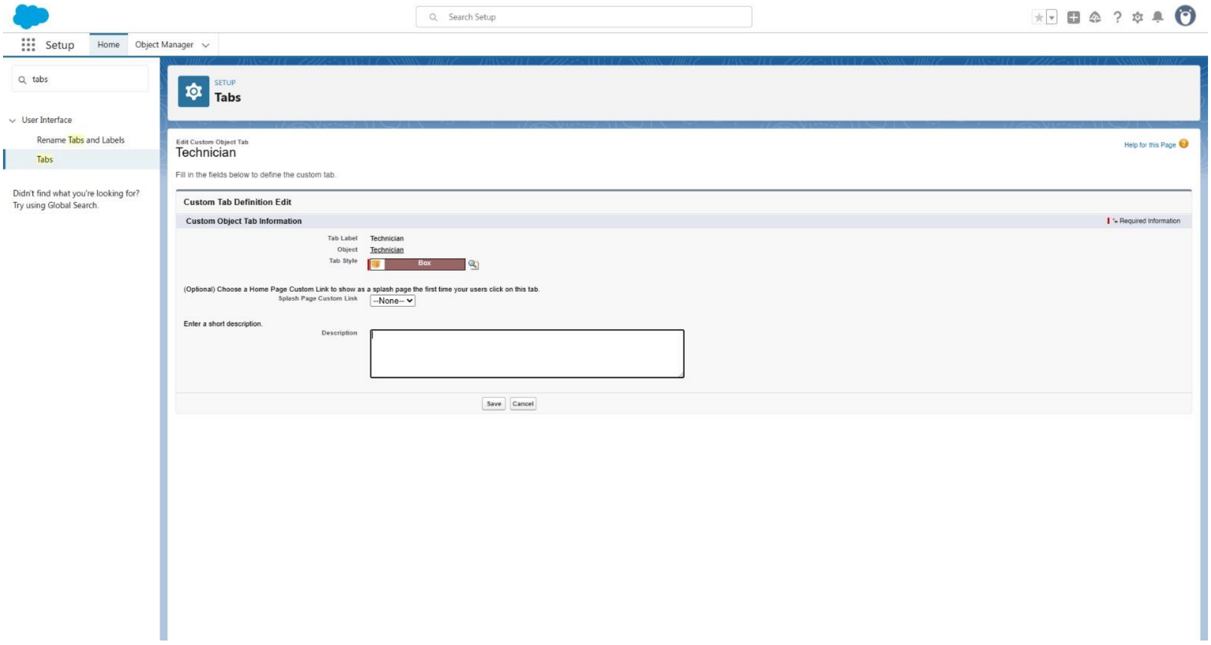
(Optional) Choose a Home Page Custom Link to show as a splash page the first time your users click on this tab.

Splash Page Custom Link: --None--

Enter a short description.

Description:

Technician Tab:



Edit Custom Object Tab

Technician

Fill in the fields below to define the custom tab.

Custom Tab Definition Edit

Custom Object Tab Information | = Required Information

Tab Label: Technician

Object: Technician

Tab Style: Box

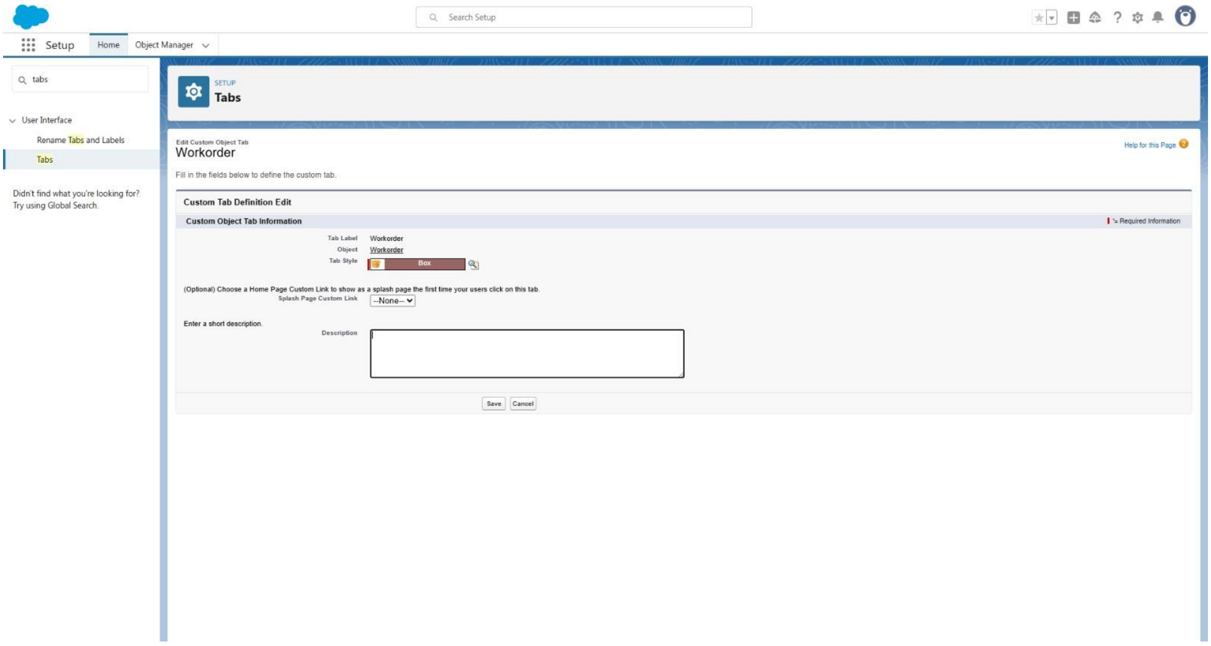
(Optional) Choose a Home Page Custom Link to show as a splash page the first time your users click on this tab.

Splash Page Custom Link: --None--

Enter a short description.

Description:

Workorder Tab:



Edit Custom Object Tab

Workorder

Fill in the fields below to define the custom tab.

Custom Tab Definition Edit

Custom Object Tab Information | = Required Information

Tab Label: Workorder

Object: Workorder

Tab Style: Box

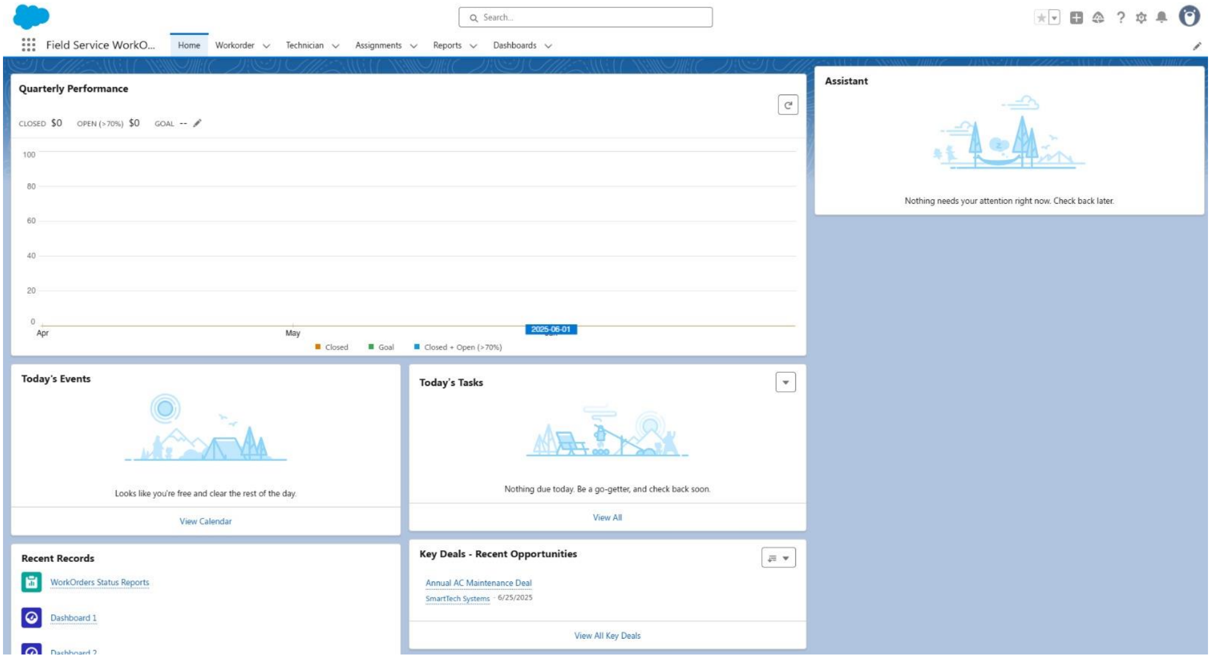
(Optional) Choose a Home Page Custom Link to show as a splash page the first time your users click on this tab.

Splash Page Custom Link: --None--

Enter a short description.

Description:

Field Service WorkOrder Lightning App:



Nothing needs your attention right now. Check back later.

Looks like you're free and clear the rest of the day.

Nothing due today. Be a go-getter, and check back soon.

WorkOrders Status Reports

Dashboard 1

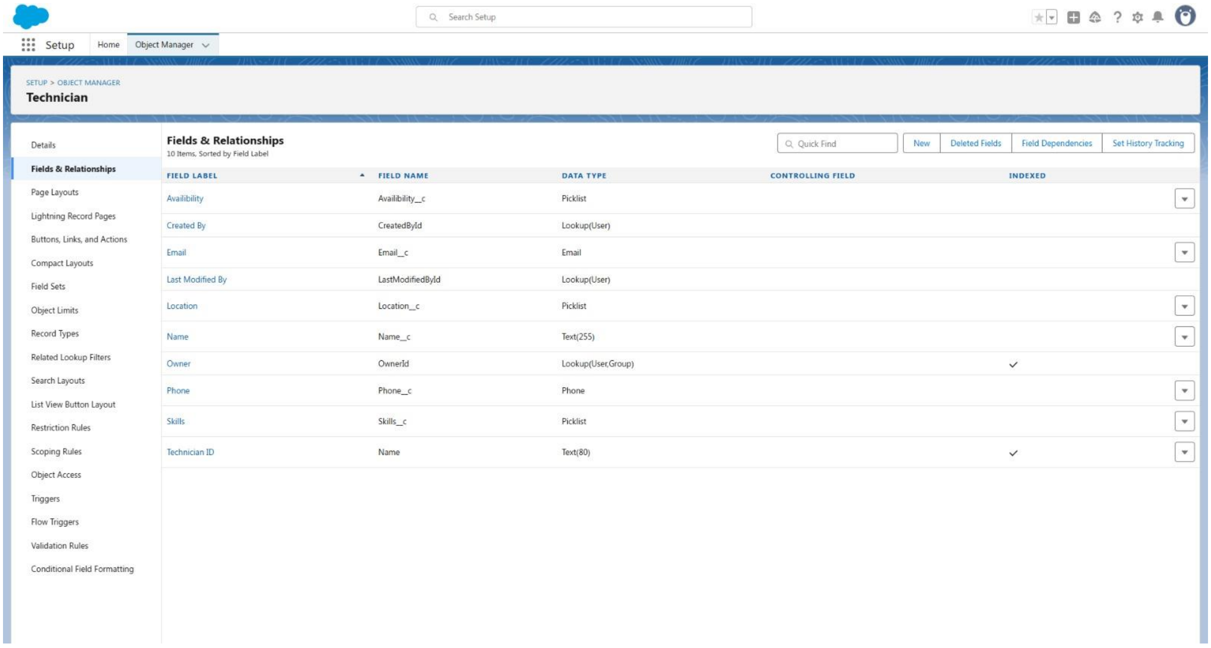
Dashboard 2

Annual AC Maintenance Deal

SmartTech Systems · 6/25/2025

- Configured fields and Relationship to ensure data integrity

Fields of Technician object:



SETUP > OBJECT MANAGER

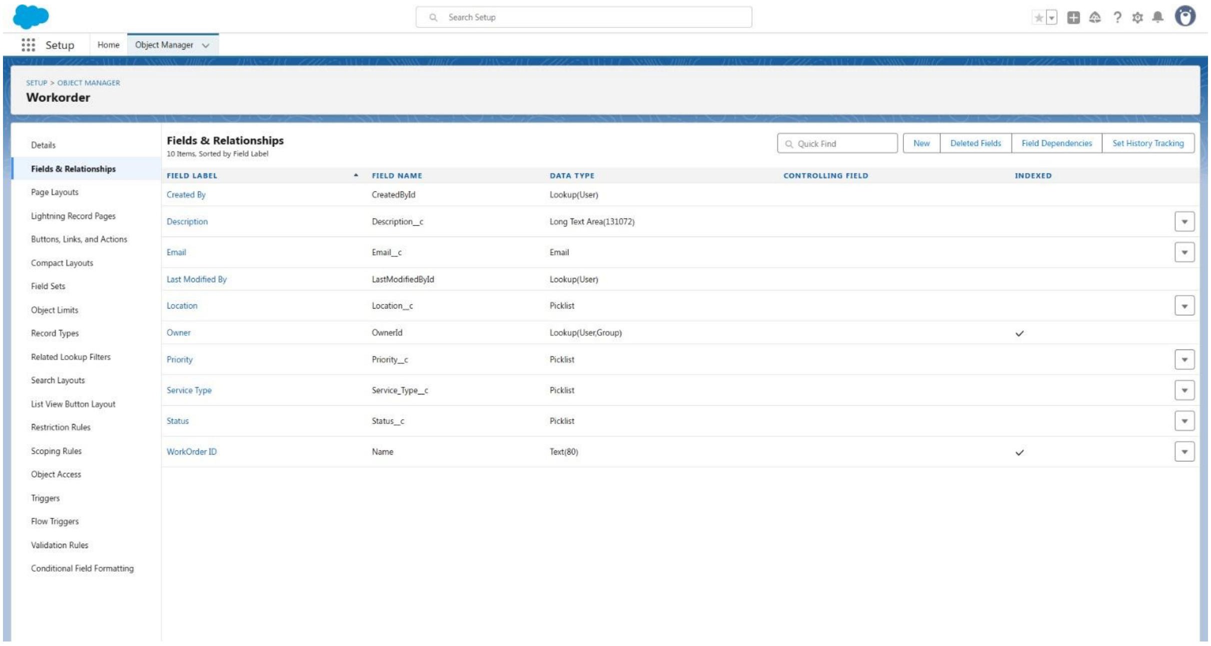
Technician

Fields & Relationships

10 Items, Sorted by Field Label

FIELD LABEL ▲	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Availibility	Availibility__c	Picklist		
Created By	CreatedById	Lookup(User)		
Email	Email__c	Email		
Last Modified By	LastModifiedById	Lookup(User)		
Location	Location__c	Picklist		
Name	Name__c	Text(255)		
Owner	OwnerId	Lookup(User,Group)		✓
Phone	Phone__c	Phone		
Skills	Skills__c	Picklist		
Technician ID	Name	Text(80)		✓

Fields of Workorder Object:



SETUP > OBJECT MANAGER

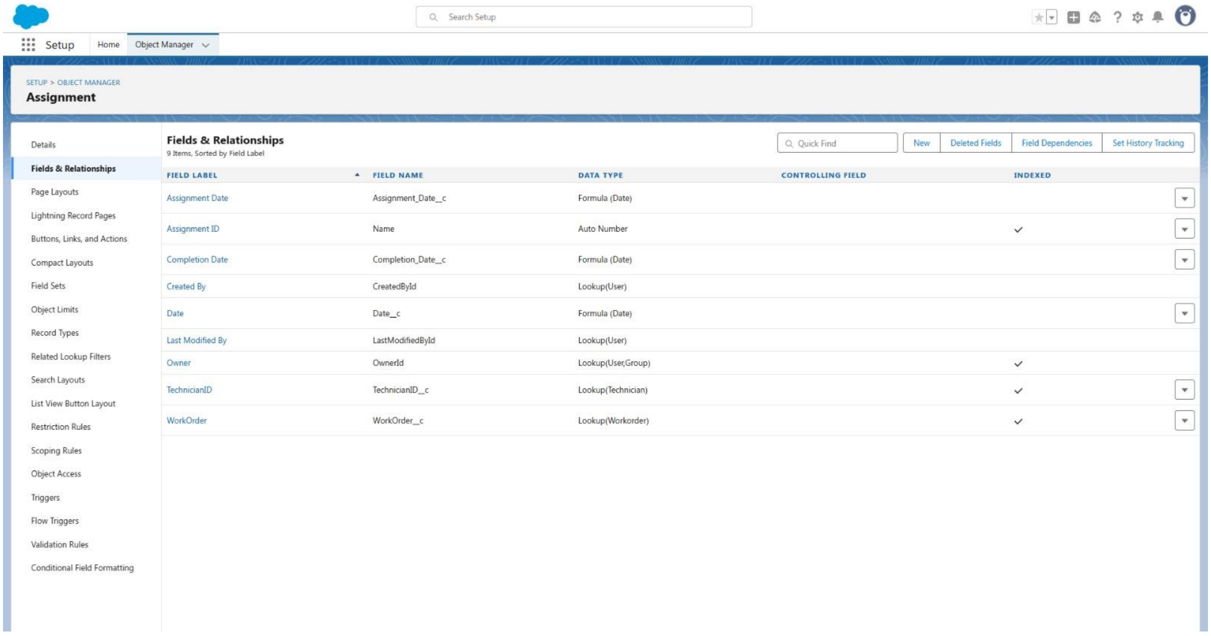
Workorder

Fields & Relationships

10 Items, Sorted by Field Label

FIELD LABEL ▲	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Created By	CreatedById	Lookup(User)		
Description	Description__c	Long Text Area(131072)		
Email	Email__c	Email		
Last Modified By	LastModifiedById	Lookup(User)		
Location	Location__c	Picklist		
Owner	OwnerId	Lookup(User,Group)		✓
Priority	Priority__c	Picklist		
Service Type	Service_Type__c	Picklist		
Status	Status__c	Picklist		
WorkOrder ID	Name	Text(80)		✓

Fields of Assignment object:



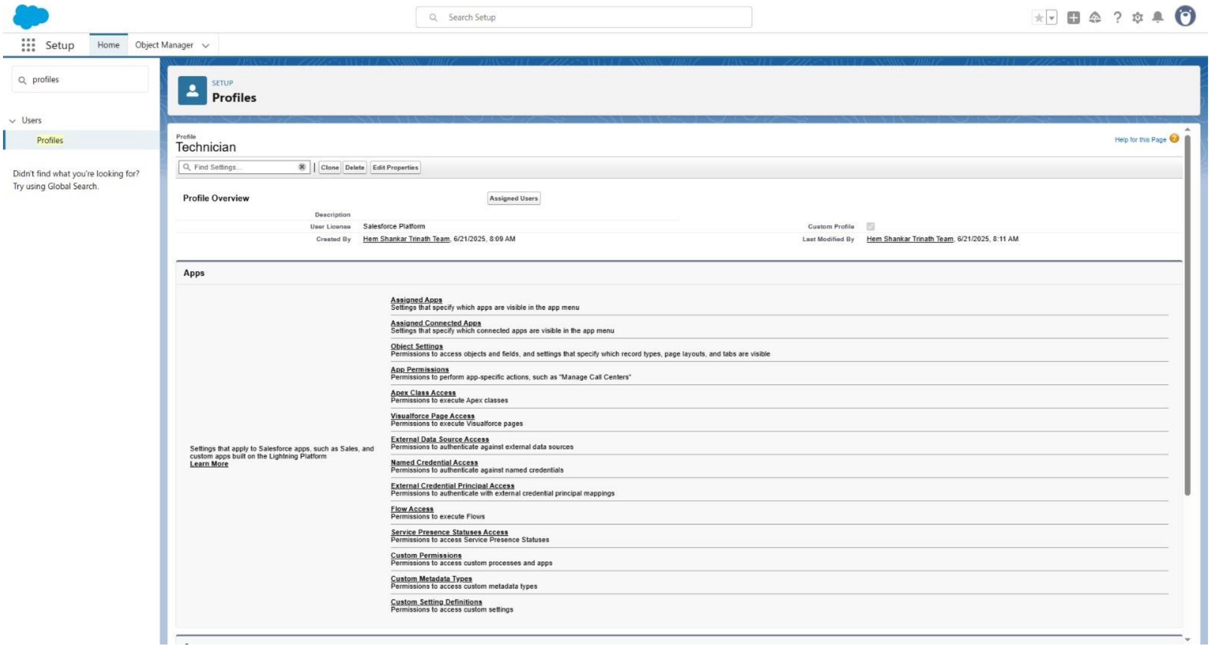
Fields & Relationships

9 Items, Sorted by Field Label

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Assignment Date	Assignment_Date__c	Formula (Date)		
Assignment ID	Name	Auto Number		✓
Completion Date	Completion_Date__c	Formula (Date)		
Created By	CreatedById	Lookup(User)		
Date	Date__c	Formula (Date)		
Last Modified By	LastModifiedById	Lookup(User)		
Owner	OwnerId	Lookup(User,Group)		✓
TechnicianID	TechnicianID__c	Lookup(Technician)		✓
WorkOrder	WorkOrder__c	Lookup(Workorder)		✓

- Created custom profiles with role-based access and added users with appropriate permissions to manage WorkOrders and Assignments securely.

Technician profile:



Profile

Technician

Profile Overview

Description			
User License	Salesforce Platform	Custom Profile	☑
Created By	Hem Shankar Trinath Team, 6/21/2025, 8:09 AM	Last Modified By	Hem Shankar Trinath Team, 6/21/2025, 8:11 AM

Apps

Settings that apply to Salesforce apps, such as Sales, and custom apps built on the Lightning Platform
Learn More

Assigned Apps
Settings that specify which apps are visible in the app menu

Assigned Connected Apps
Settings that specify which connected apps are visible in the app menu

Object Settings
Permissions to access objects and fields, and settings that specify which record types, page layouts, and tabs are visible

App Permissions
Permissions to perform app-specific actions, such as "Manage Call Centers"

Apex Class Access
Permissions to execute Apex classes

Visualforce Page Access
Permissions to execute Visualforce pages

External Data Source Access
Permissions to authenticate against external data sources

Named Credential Access
Permissions to authenticate against named credentials

External Credential Principal Access
Permissions to authenticate with external credential principal mappings

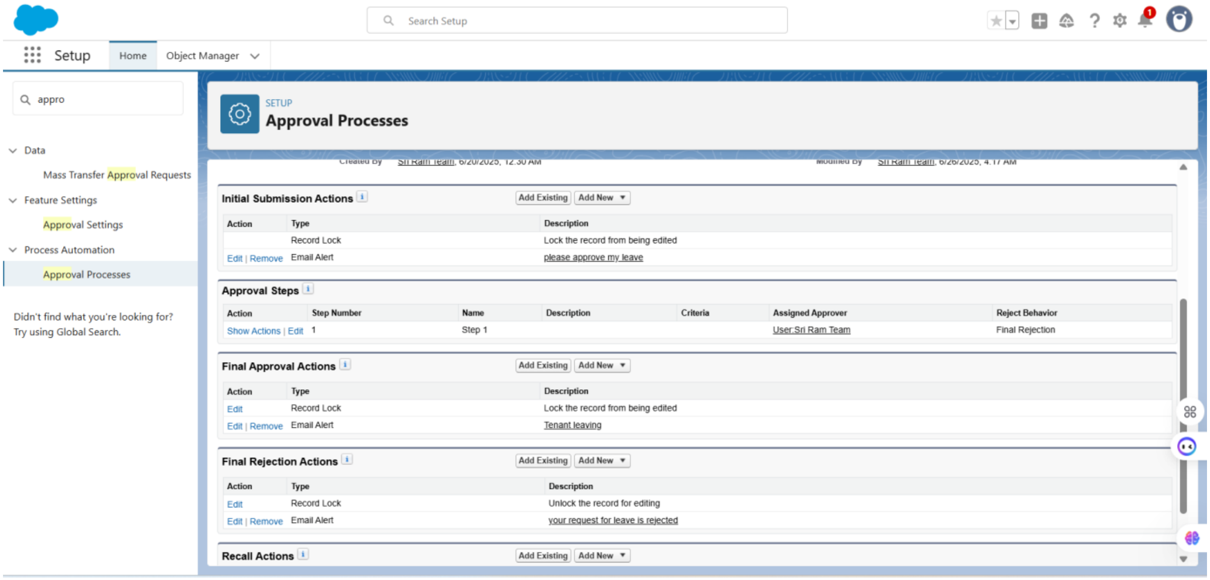
Flow Access
Permissions to execute Flows

Service Presence Statuses Access
Permissions to access Service Presence Statuses

Custom Permissions
Permissions to access custom processes and apps

Custom Metadata Types
Permissions to access custom metadata types

Custom Setting Definitions
Permissions to access custom settings



Approval Processes

Created By Sri Ram Team, 6/20/2025, 12:30 AM Modified By Sri Ram Team, 6/26/2025, 4:17 AM

Initial Submission Actions Add Existing Add New ▾

Action	Type	Description
	Record Lock	Lock the record from being edited
Edit | Remove	Email Alert	please approve my leave

Approval Steps

Action	Step Number	Name	Description	Criteria	Assigned Approver	Reject Behavior
Show Actions | Edit	1	Step 1			User:Sri Ram Team	Final Rejection

Final Approval Actions Add Existing Add New ▾

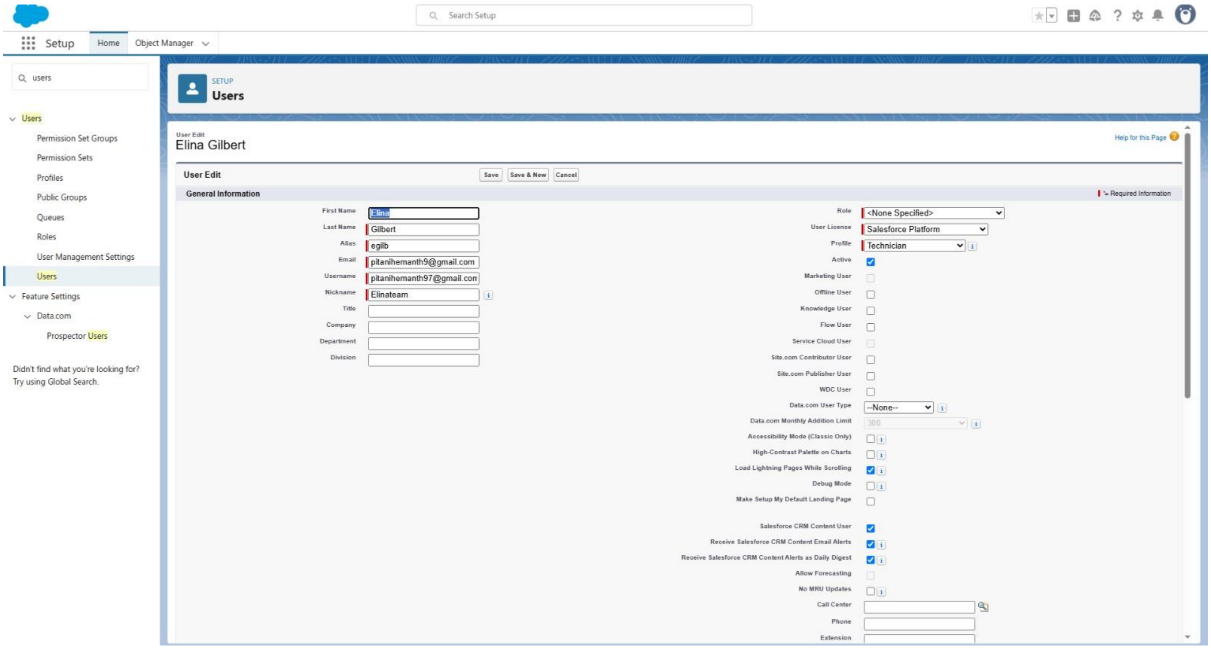
Action	Type	Description
Edit	Record Lock	Lock the record from being edited
Edit | Remove	Email Alert	Tenant leaving

Final Rejection Actions Add Existing Add New ▾

Action	Type	Description
Edit	Record Lock	Unlock the record for editing
Edit | Remove	Email Alert	your request for leave is rejected

Recall Actions Add Existing Add New ▾

User:



User Edit

Elina Gilbert

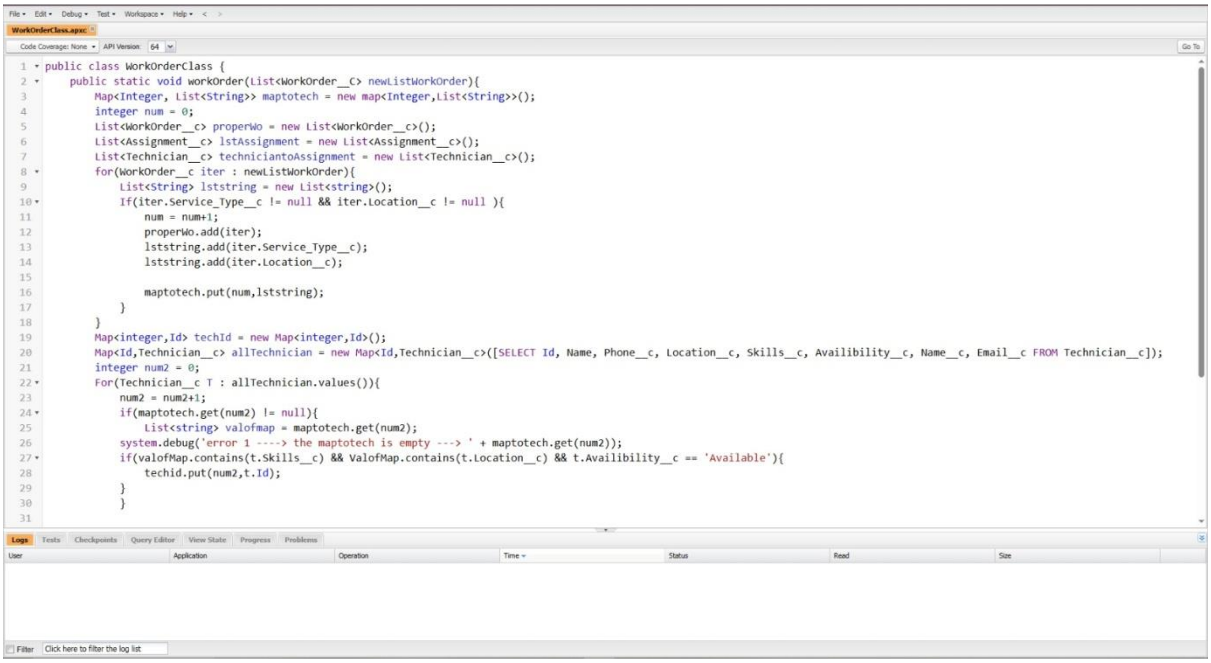
User Edit

General Information | = Required Information

First Name	Elina	Role	<None Specified>
Last Name	Gilbert	User License	Salesforce Platform
Alias	egilb	Profile	Technician
Email	pitanihemanth9@gmail.com	Active	☑
Username	pitanihemanth97@gmail.com	Marketing User	□
Nickname	Elinateam	Offline User	□
Title		Knowledge User	□
Company		Flow User	□
Department		Service Cloud User	□
Division		Site.com Contributor User	□
		Site.com Publisher User	□
		WDC User	□
		Data.com User Type	--None--
		Data.com Monthly Addition Limit	300
		Accessibility Mode (Classic Only)	□
		High-Contrast Palette on Charts	□
		Load Lightning Pages While Scrolling	☑
		Debug Mode	□
		Make Setup My Default Landing Page	□
		Salesforce CRM Content User	☑
		Receive Salesforce CRM Content Email Alerts	☑
		Receive Salesforce CRM Content Alerts as Daily Digest	☑
		Allow Forecasting	□
		No MRU Updates	□
		Call Center	
		Phone	
		Extension	

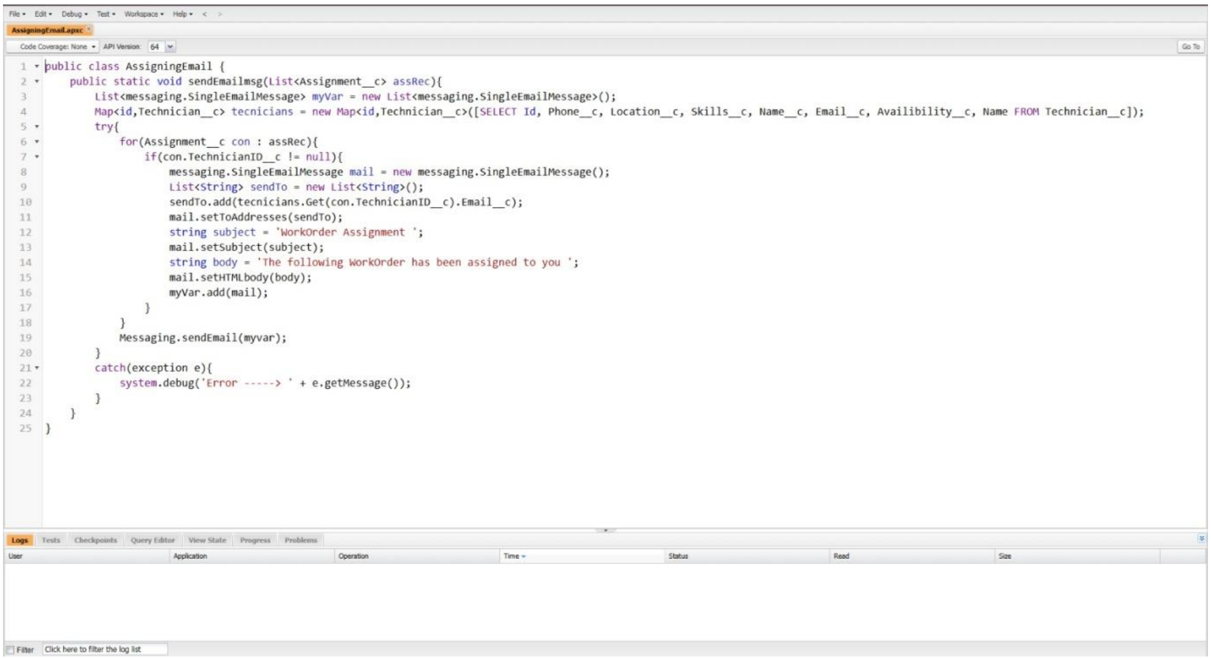
- Developed multiple Apex Classes to automate WorkOrder assignment (WorkOrderClass), send technician notifications (AssigningEmail, CompletionMail), and manage record cleanup through batch and scheduled jobs (RecordDeletions, ScheduleClass).

WorkOrderClass:



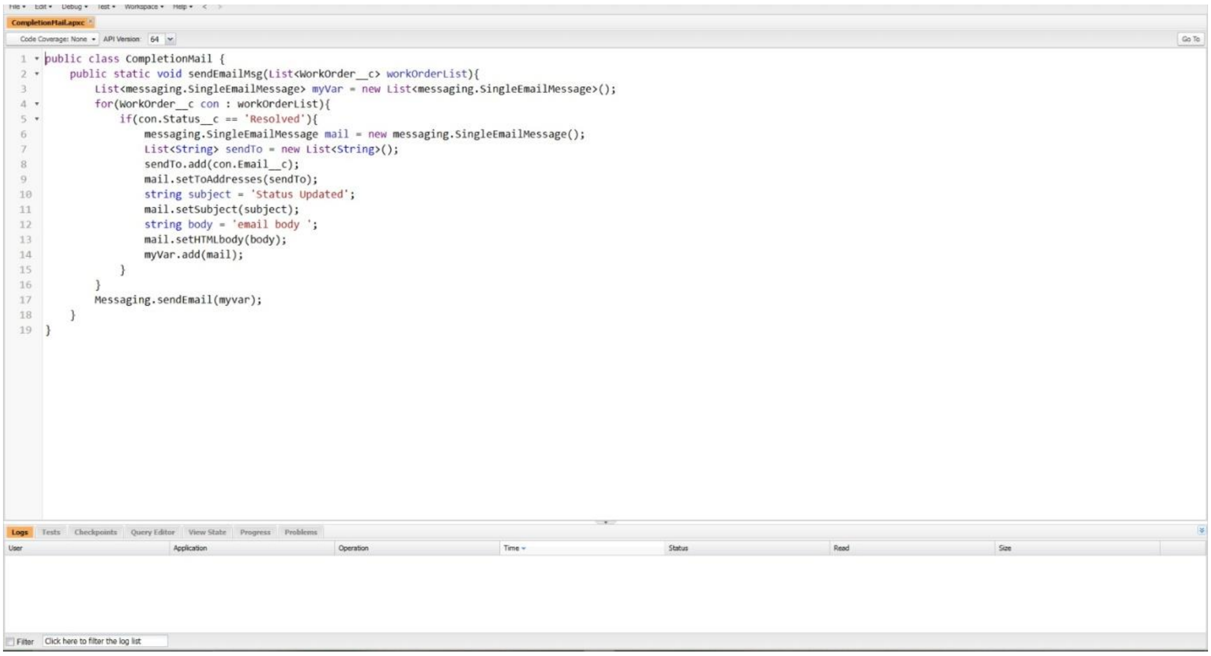
```
public class WorkOrderClass {
    public static void workOrder(List<WorkOrder__C> newListWorkOrder){
        Map<Integer, List<String>> maptotech = new map<Integer,List<String>>();
        integer num = 0;
        List<WorkOrder__c> properWo = new List<WorkOrder__c>();
        List<Assignment__c> lstAssignment = new List<Assignment__c>();
        List<Technician__c> techniciantoAssignment = new List<Technician__c>();
        for(WorkOrder__c iter : newListWorkOrder){
            List<String> lststring = new List<string>();
            If(iter.Service_Type__c != null && iter.Location__c != null ){
                num = num+1;
                properWo.add(iter);
                lststring.add(iter.Service_Type__c);
                lststring.add(iter.Location__c);

                maptotech.put(num,lststring);
            }
        }
        Map<integer,Id> techId = new Map<integer,Id>();
        Map<Id,Technician__c> allTechnician = new Map<Id,Technician__c>([SELECT Id, Name, Phone__c, Location__c, Skills__c, Availibility__c, Name__c, Email__c FROM Technician__c]);
        integer num2 = 0;
        For(Technician__c T : allTechnician.values()){
            num2 = num2+1;
            if(maptotech.get(num2) != null){
                List<string> valofmap = maptotech.get(num2);
            system.debug('error 1 ----> the maptotech is empty ---> ' + maptotech.get(num2));
            if(valofMap.contains(t.Skills__c) && ValofMap.contains(t.Location__c) && t.Availibility__c == 'Available'){
                techid.put(num2,t.Id);
            }
            }

```

AssigningEmail:



```
public class AssigningEmail {
    public static void sendEmailmsg(List<Assignment__c> assRec){
        List<messaging.SingleEmailMessage> myVar = new List<messaging.SingleEmailMessage>();
        Map<id,Technician__c> tecnicians = new Map<id,Technician__c>([SELECT Id, Phone__c, Location__c, Skills__c, Name__c, Email__c, Availibility__c, Name FROM Technician__c]);
        try{
            for(Assignment__c con : assRec){
                if(con.TechnicianID__c != null){
                    messaging.SingleEmailMessage mail = new messaging.SingleEmailMessage();
                    List<String> sendTo = new List<String>();
                    sendTo.add(tecnicians.Get(con.TechnicianID__c).Email__c);
                    mail.setToAddresses(sendTo);
                    string subject = 'WorkOrder Assignment ';
                    mail.setSubject(subject);
                    string body = 'The following WorkOrder has been assigned to you ';
                    mail.setHTMLbody(body);
                    myVar.add(mail);
                }
            }
            Messaging.sendEmail(myvar);
        }
        catch(exception e){
            system.debug('Error -----> ' + e.getMessage());
        }
    }
}
```

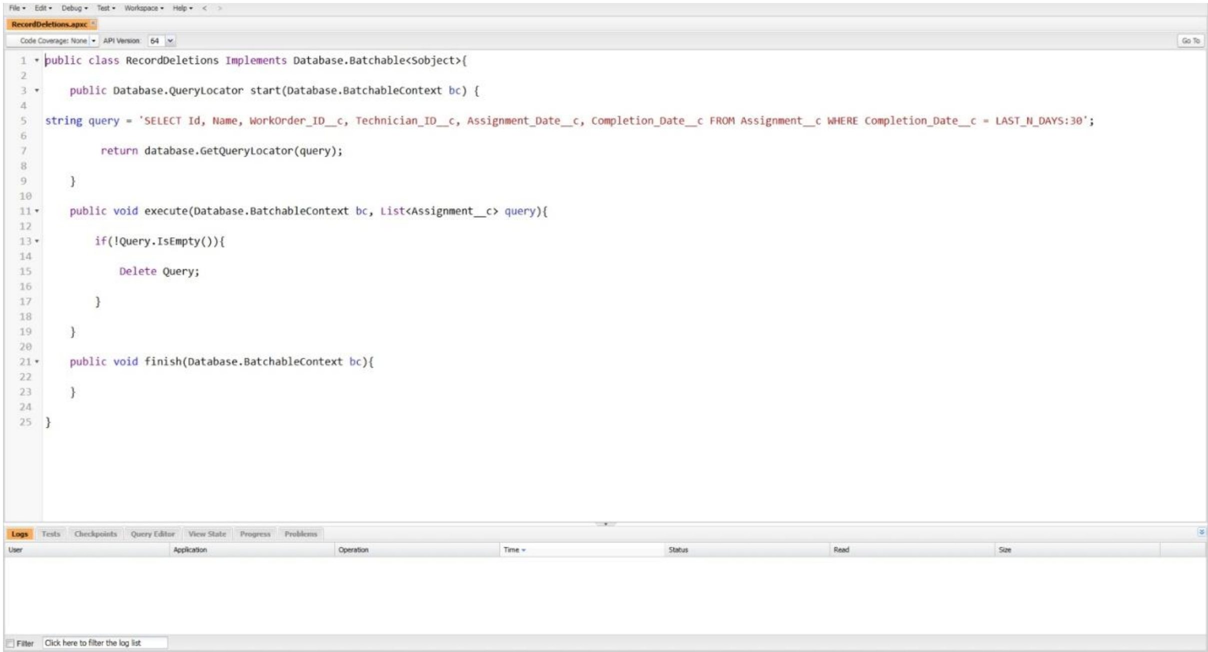
Completion mail:


File ▾ Edit ▾ Debug ▾ Test ▾ Workspace ▾ Help ▾ < >
CompletionMail.apxc
Go To
Logs Tests Checkpoints Query Editor View State Progress Problems
User Application Operation Time ▾ Status Read Size
Filter Click here to filter the log list

Code Coverage: None ▾ API Version: 64

```
public class CompletionMail {
    public static void sendEmailMsg(List<WorkOrder__c> workOrderList){
        List<messaging.SingleEmailMessage> myVar = new List<messaging.SingleEmailMessage>();
        for(WorkOrder__c con : workOrderList){
            if(con.Status__c == 'Resolved'){
                messaging.SingleEmailMessage mail = new messaging.SingleEmailMessage();
                List<String> sendTo = new List<String>();
                sendTo.add(con.Email__c);
                mail.setToAddresses(sendTo);
                string subject = 'Status Updated';
                mail.setSubject(subject);
                string body = 'email body ';
                mail.setHTMLbody(body);
                myVar.add(mail);
            }
        }
        Messaging.sendEmail(myvar);
    }
}
```

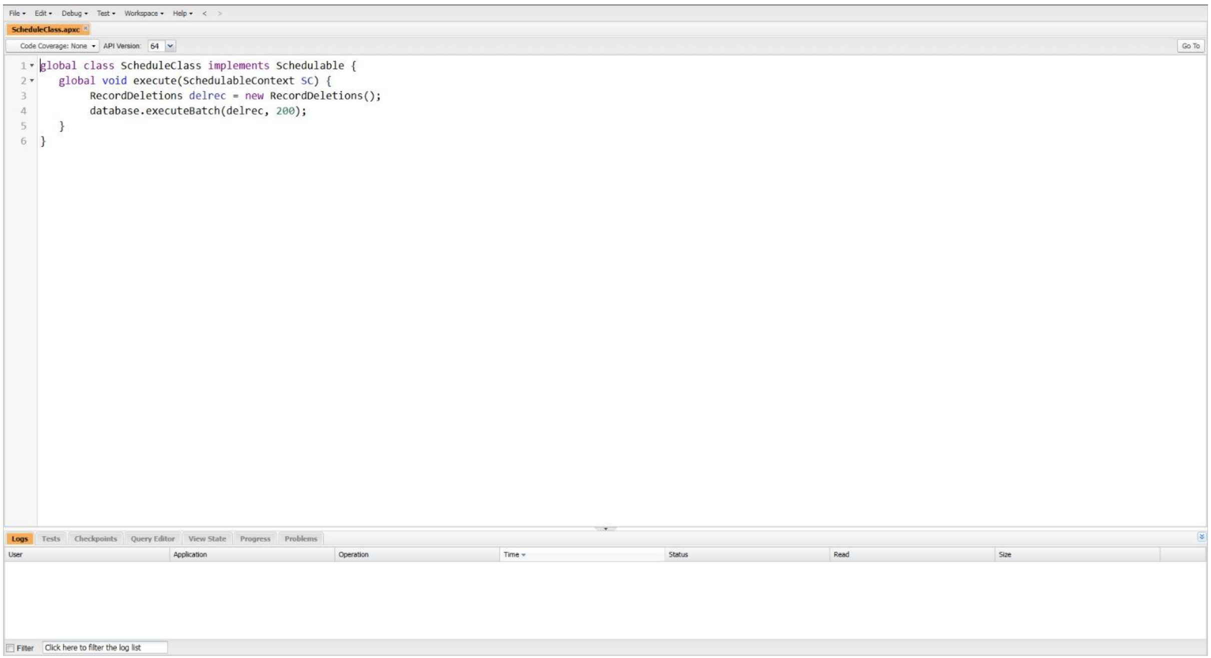
RecordDeletions:


File ▾ Edit ▾ Debug ▾ Test ▾ Workspace ▾ Help ▾ < >
RecordDeletions.apxc
Go To
Logs Tests Checkpoints Query Editor View State Progress Problems
User Application Operation Time ▾ Status Read Size
Filter Click here to filter the log list

Code Coverage: None ▾ API Version: 64

```
public class RecordDeletions Implements Database.Batchable<Sobject>{

    public Database.QueryLocator start(Database.BatchableContext bc) {

string query = 'SELECT Id, Name, WorkOrder_ID__c, Technician_ID__c, Assignment_Date__c, Completion_Date__c FROM Assignment__c WHERE Completion_Date__c = LAST_N_DAYS:30';

         return database.GetQueryLocator(query);

    }

    public void execute(Database.BatchableContext bc, List<Assignment__c> query){

        if(!Query.IsEmpty()){

            Delete Query;

        }

    }

    public void finish(Database.BatchableContext bc){

    }

}
```

Schedule class:

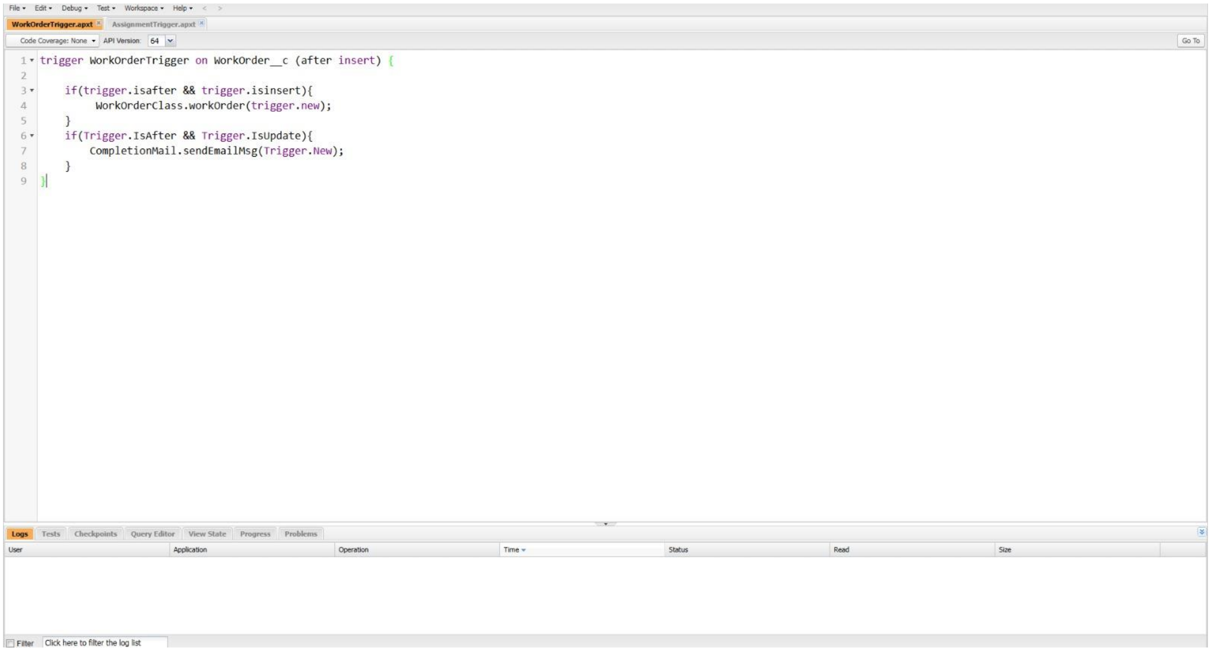


Code Coverage: None API Version: 64

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

- Implemented Apex Trigger to automatically assign WorkOrders to available Technicians based on matching location and skill criteria.

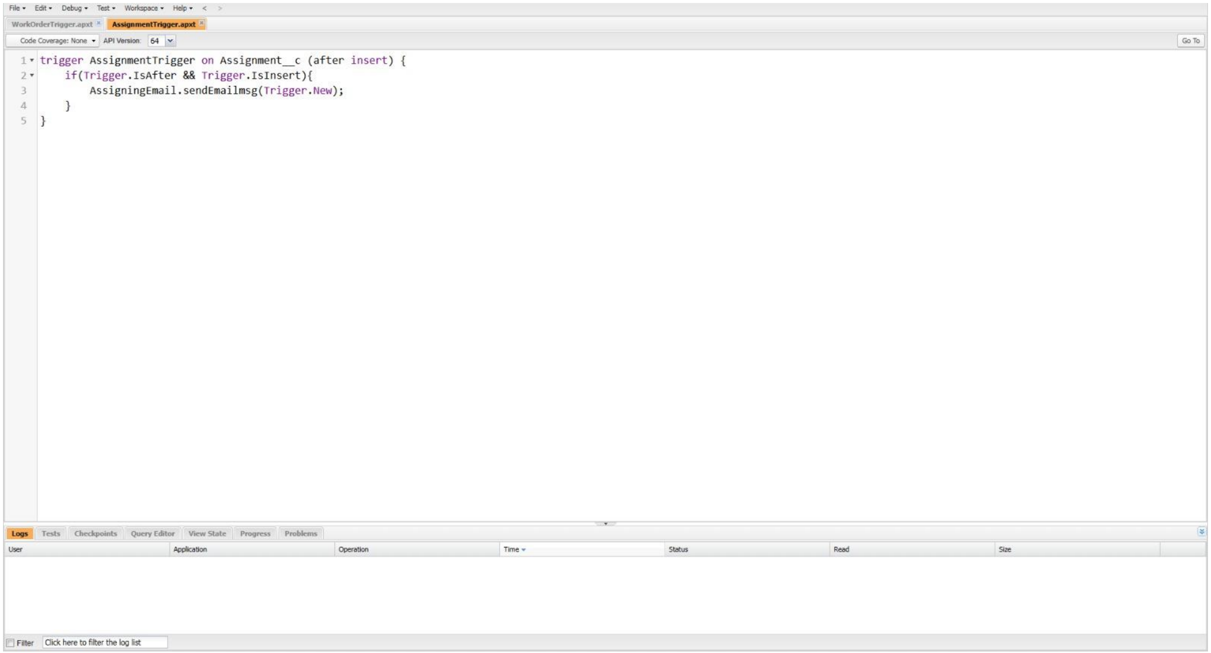
Workorder trigger:



Code Coverage: None API Version: 64

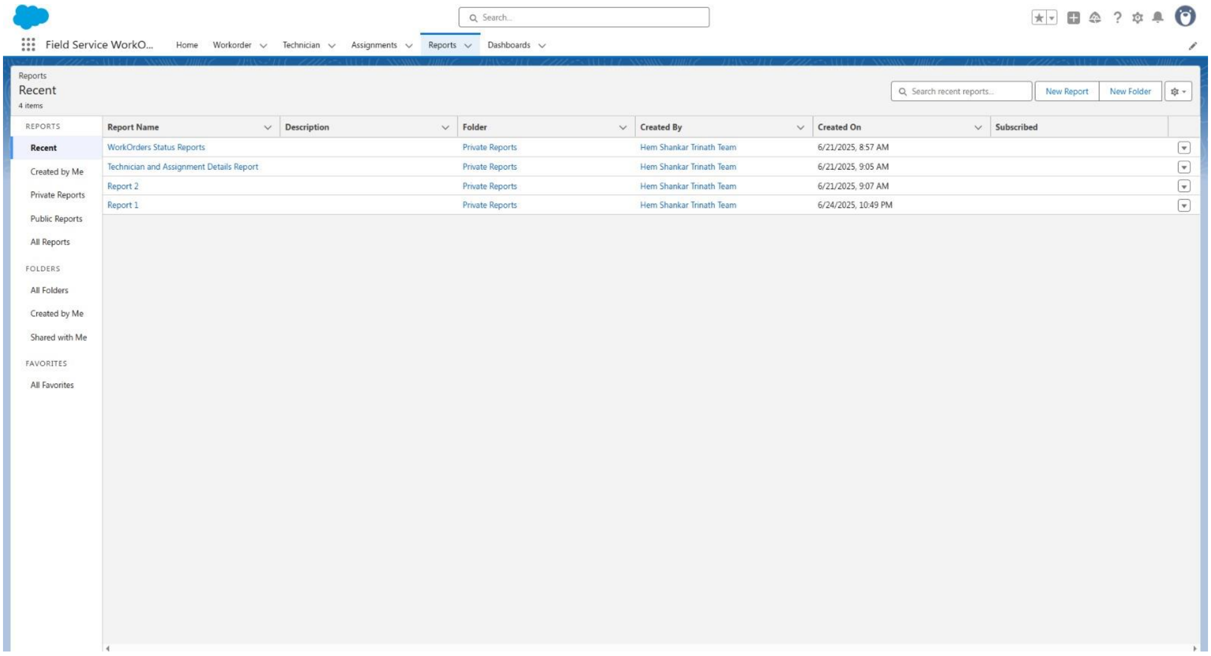
```
trigger WorkOrderTrigger on WorkOrder__c (after insert) {

    if(trigger.isafter && trigger.isinsert){
         WorkOrderClass.workOrder(trigger.new);
    }
    if(Trigger.IsAfter && Trigger.IsUpdate){
        CompletionMail.sendEmailMsg(Trigger.New);
    }
}
```

Assignment trigger:



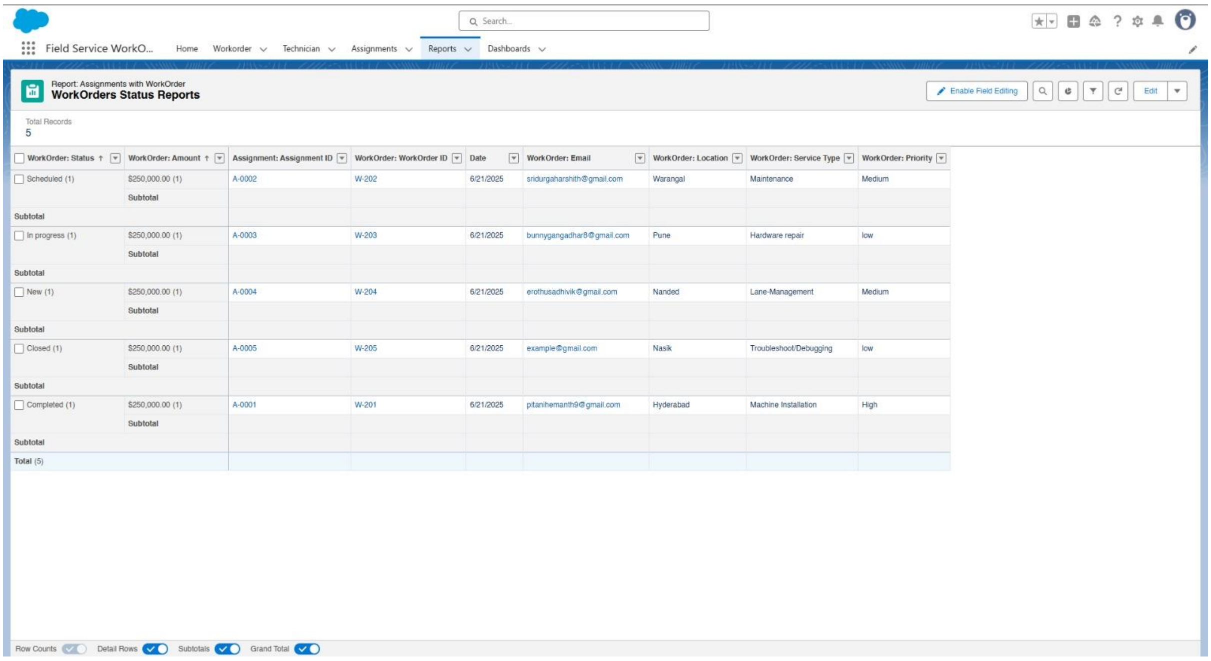
```
trigger AssignmentTrigger on Assignment__c (after insert) {
    if(Trigger.IsAfter && Trigger.IsInsert){
        AssigningEmail.sendEmailmsg(Trigger.New);
    }
}
```

- Created Reports and Dashboards to monitor WorkOrder statuses, technician assignments, and service performance, enabling real-time visibility and data-driven decision-making.



Report Name	Description	Folder	Created By	Created On	Subscribed
WorkOrders Status Reports		Private Reports	Hem Shankar Trinath Team	6/21/2025, 8:57 AM	
Technician and Assignment Details Report		Private Reports	Hem Shankar Trinath Team	6/21/2025, 9:05 AM	
Report 2		Private Reports	Hem Shankar Trinath Team	6/21/2025, 9:07 AM	
Report 1		Private Reports	Hem Shankar Trinath Team	6/24/2025, 10:49 PM	

WorkOrders Status Reports:

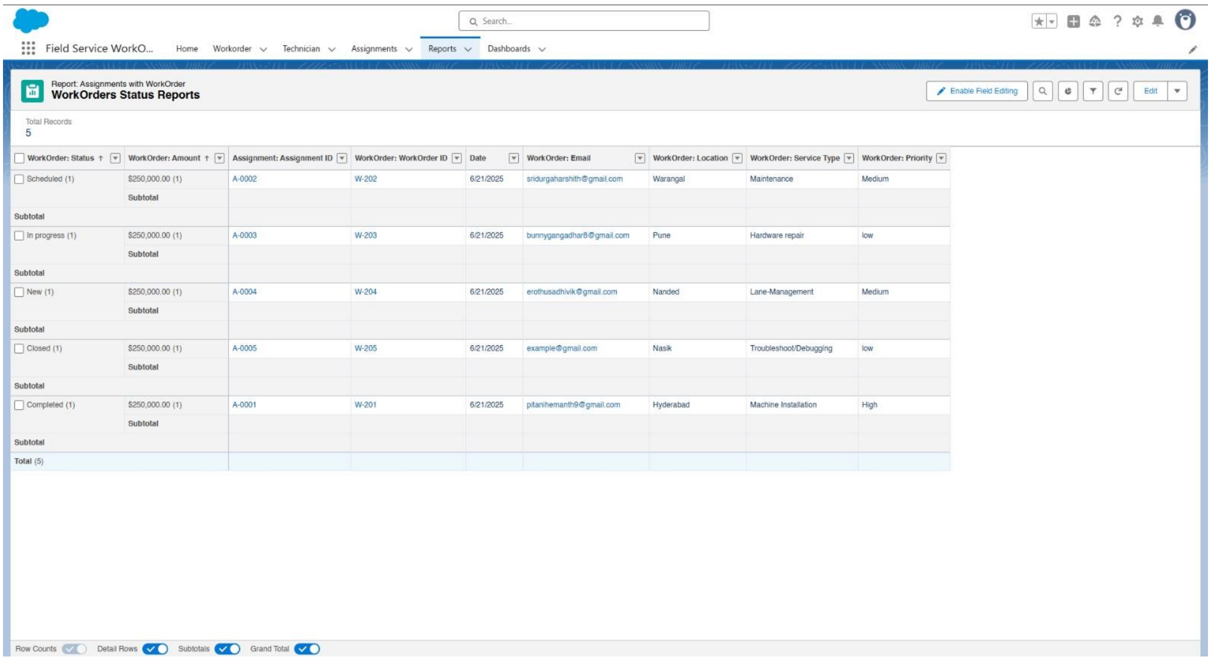


Report: Assignments with WorkOrder
WorkOrders Status Reports

Total Records
5

WorkOrder: Status ↑	WorkOrder: Amount ↑	Assignment: Assignment ID	WorkOrder: WorkOrder ID	Date	WorkOrder: Email	WorkOrder: Location	WorkOrder: Service Type	WorkOrder: Priority
□ Scheduled (1)	$250,000.00 (1)	A-0002	W-202	6/21/2025	sridurgaharshith@gmail.com	Warangal	Maintenance	Medium
	Subtotal							
Subtotal								
□ In progress (1)	$250,000.00 (1)	A-0003	W-203	6/21/2025	bunnygangadhar8@gmail.com	Pune	Hardware repair	low
	Subtotal							
Subtotal								
□ New (1)	$250,000.00 (1)	A-0004	W-204	6/21/2025	erothusadhivik@gmail.com	Nanded	Lane-Management	Medium
	Subtotal							
Subtotal								
□ Closed (1)	$250,000.00 (1)	A-0005	W-205	6/21/2025	example@gmail.com	Nasik	Troubleshoot/Debugging	low
	Subtotal							
Subtotal								
□ Completed (1)	$250,000.00 (1)	A-0001	W-201	6/21/2025	pitanihemanth9@gmail.com	Hyderabad	Machine Installation	High
	Subtotal							
Subtotal								
Total (5)								

Technician and Assignment Details Reports:

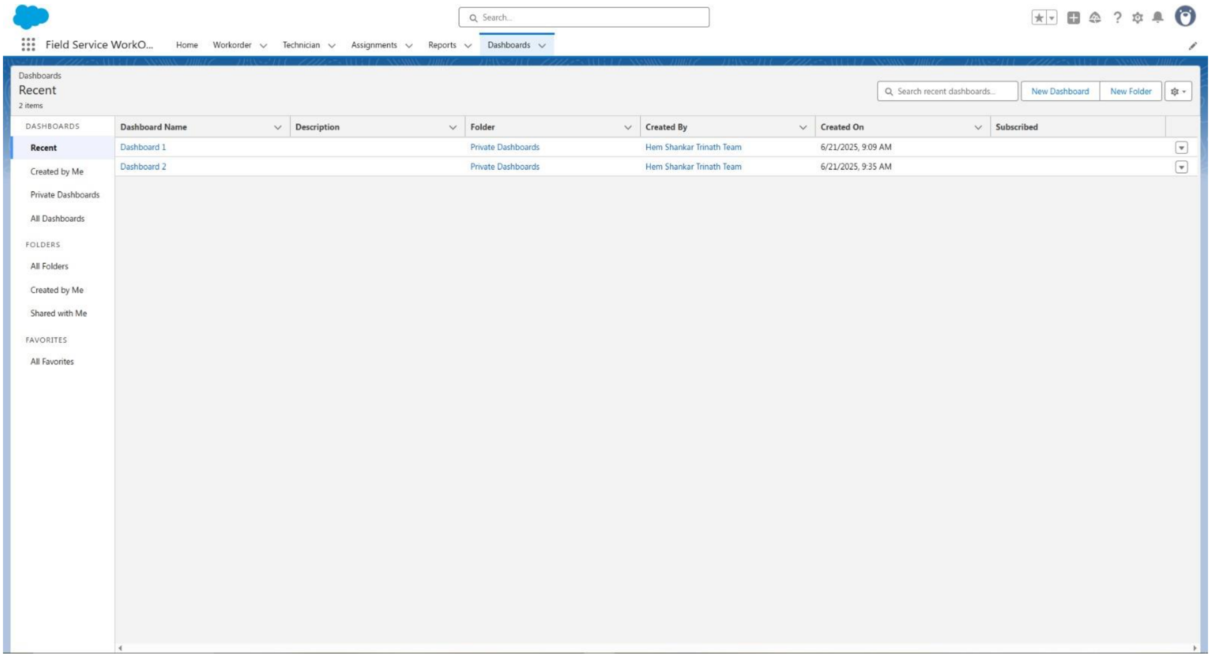


Report: Assignments with WorkOrder
WorkOrders Status Reports

Total Records
5

WorkOrder: Status ↑	WorkOrder: Amount ↑	Assignment: Assignment ID	WorkOrder: WorkOrder ID	Date	WorkOrder: Email	WorkOrder: Location	WorkOrder: Service Type	WorkOrder: Priority
□ Scheduled (1)	$250,000.00 (1)	A-0002	W-202	6/21/2025	sridurgaharshith@gmail.com	Warangal	Maintenance	Medium
	Subtotal							
Subtotal								
□ In progress (1)	$250,000.00 (1)	A-0003	W-203	6/21/2025	bunnygangadhar8@gmail.com	Pune	Hardware repair	low
	Subtotal							
Subtotal								
□ New (1)	$250,000.00 (1)	A-0004	W-204	6/21/2025	erothusadhivik@gmail.com	Nanded	Lane-Management	Medium
	Subtotal							
Subtotal								
□ Closed (1)	$250,000.00 (1)	A-0005	W-205	6/21/2025	example@gmail.com	Nasik	Troubleshoot/Debugging	low
	Subtotal							
Subtotal								
□ Completed (1)	$250,000.00 (1)	A-0001	W-201	6/21/2025	pitanihemanth9@gmail.com	Hyderabad	Machine Installation	High
	Subtotal							
Subtotal								
Total (5)								

Dashboards



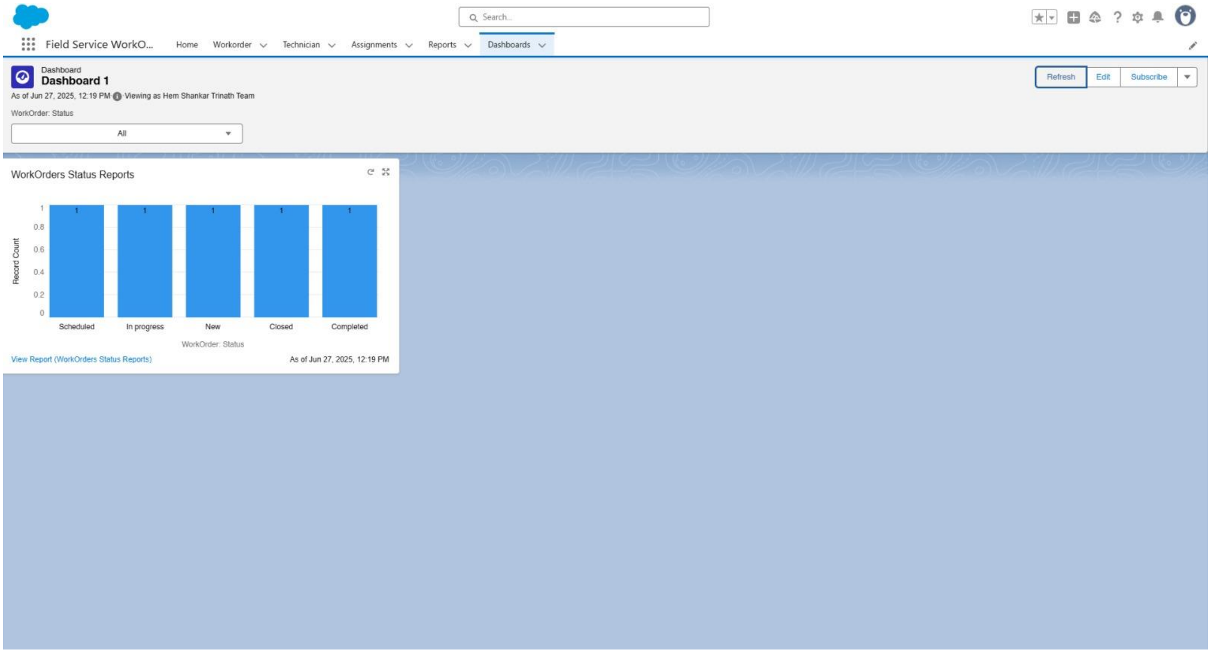
Dashboards

Recent

2 items

Dashboard Name	Description	Folder	Created By	Created On	Subscribed
Dashboard 1		Private Dashboards	Hem Shankar Trinath Team	6/21/2025, 9:09 AM	
Dashboard 2		Private Dashboards	Hem Shankar Trinath Team	6/21/2025, 9:35 AM	

Dashboard 1:



Dashboard

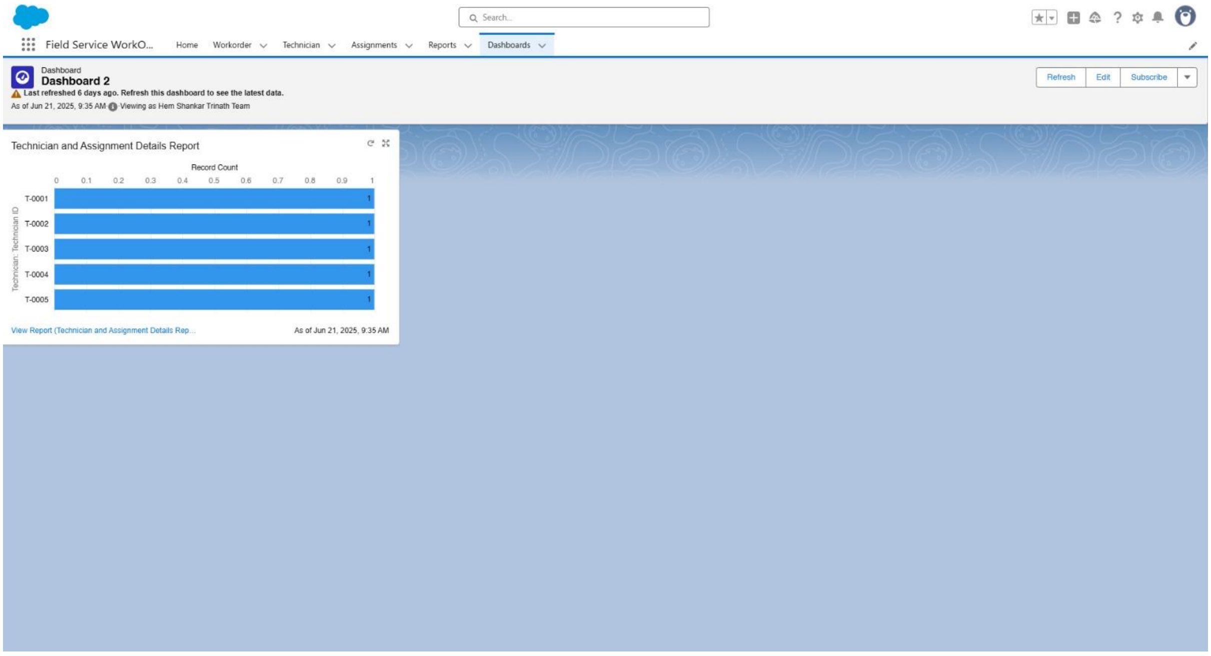
Dashboard 1

As of Jun 27, 2025, 12:19 PM · Viewing as Hem Shankar Trinath Team

WorkOrder: Status

As of Jun 27, 2025, 12:19 PM

Dashboard 2:



Dashboard

Dashboard 2

Last refreshed 6 days ago. Refresh this dashboard to see the latest data.

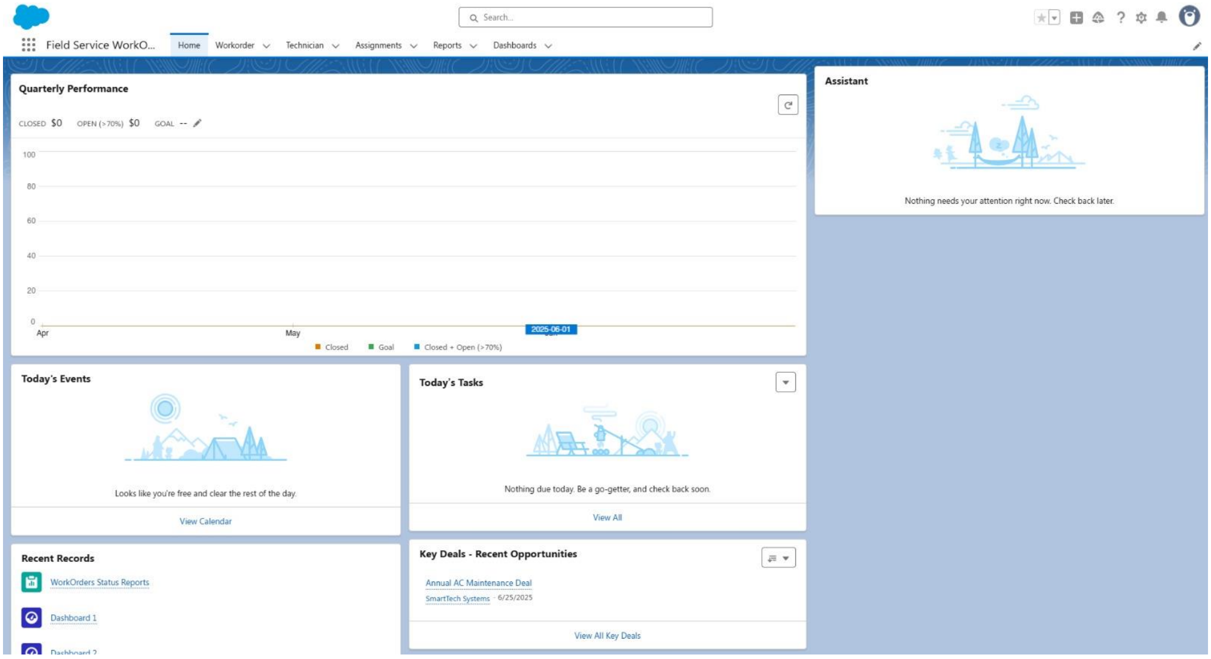
As of Jun 21, 2025, 9:35 AM · Viewing as Hem Shankar Trinath Team

Technician and Assignment Details Report

View Report (Technician and Assignment Details Rep...

As of Jun 21, 2025, 9:35 AM

● Designed a user-friendly interface using Lightning App, custom tabs, and page layouts to provide seamless access to WorkOrders, Technicians, and Assignments.



Quarterly Performance

CLOSED $0 OPEN (>70%) $0 GOAL --

Assistant

Nothing needs your attention right now. Check back later.

Today's Events

Looks like you're free and clear the rest of the day.

View Calendar

Today's Tasks

Nothing due today. Be a go-getter, and check back soon.

View All

Recent Records

WorkOrders Status Reports

Dashboard 1

Dashboard 2

Key Deals - Recent Opportunities

Annual AC Maintenance Deal

SmartTech Systems · 6/25/2025

View All Key Deals

6.2 Integration and Testing

Integration Activities

Once all custom objects (Technician, WorkOrder, and Assignment) and automation logic were developed, integration was carried out by linking them through **Lookup Relationships** to ensure seamless data flow. Each **Assignment** was linked to a **WorkOrder** and a **Technician**, enabling automatic allocation and tracking.

Apex Triggers and Classes were integrated to handle real-time actions like technician assignment and completion notifications. Email templates were connected to workflow actions to alert technicians when work orders were assigned or completed. Scheduled Apex and batch jobs were also integrated to perform periodic cleanup of resolved work orders after 30 days.

The entire automation flow—**Triggers, Flows, Email Alerts, and Scheduled Apex**—was reviewed and tested to ensure they worked cohesively and reflected actual field service processes.

Testing Approach

Testing was conducted in the **Salesforce Sandbox** environment to avoid affecting live data. A structured approach was followed:

- **Unit Testing**: Each component—custom objects, validation rules, flows, and Apex classes—was tested individually to confirm expected behavior.
- **Integration Testing**: Object interactions and automated processes were tested together to ensure correct data flow. For example, creating a WorkOrder triggered technician assignment and email notification as expected.
- **Functional Testing**: Core functions such as WorkOrder creation, status updates, technician assignment, and completion tracking were tested using real-world scenarios.
- **System Testing**: Full end-to-end testing was done to verify the overall workflow, field access control, and system behavior under normal conditions.
- **Performance Testing**: Key operations such as email sending, dashboard refresh, and batch deletions were tested for speed and reliability.
- **User Acceptance Testing (UAT)**: Admin and Technician users reviewed the system interface and functionality. Their feedback was used to fine-tune layouts and improve usability.

Outcome

The integration and testing phase ensured that the Field Service Work Order Optimization solution was robust, efficient, and deployment-ready. All automation components worked together smoothly, data consistency was maintained, and the user interface met expectations. The final system delivered accurate work order assignment, real-time technician alerts, and streamlined performance, in line with project objectives.

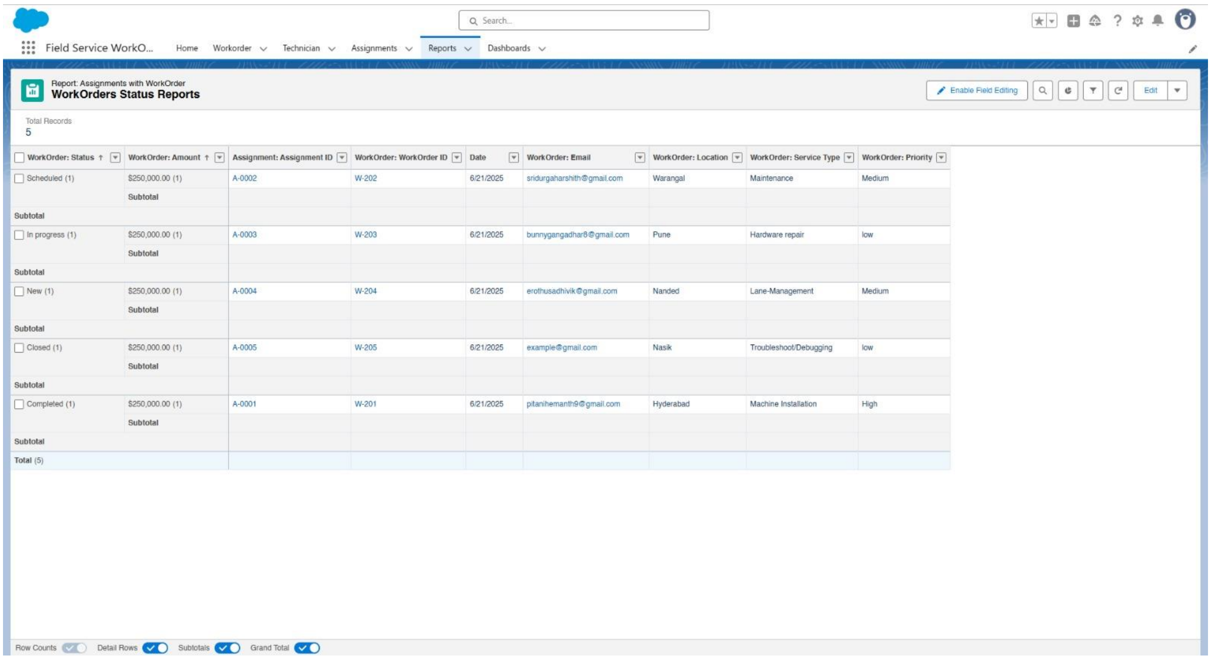
Key Highlights

- Integrated all custom objects (Technician, WorkOrder, Assignment) using lookup relationships
- Connected email templates with triggers for technician alerts
- Conducted manual and automated testing to validate all core features and flows

7. FUNCTIONAL AND PERFORMANCE TESTING

7.1 Performance Testing

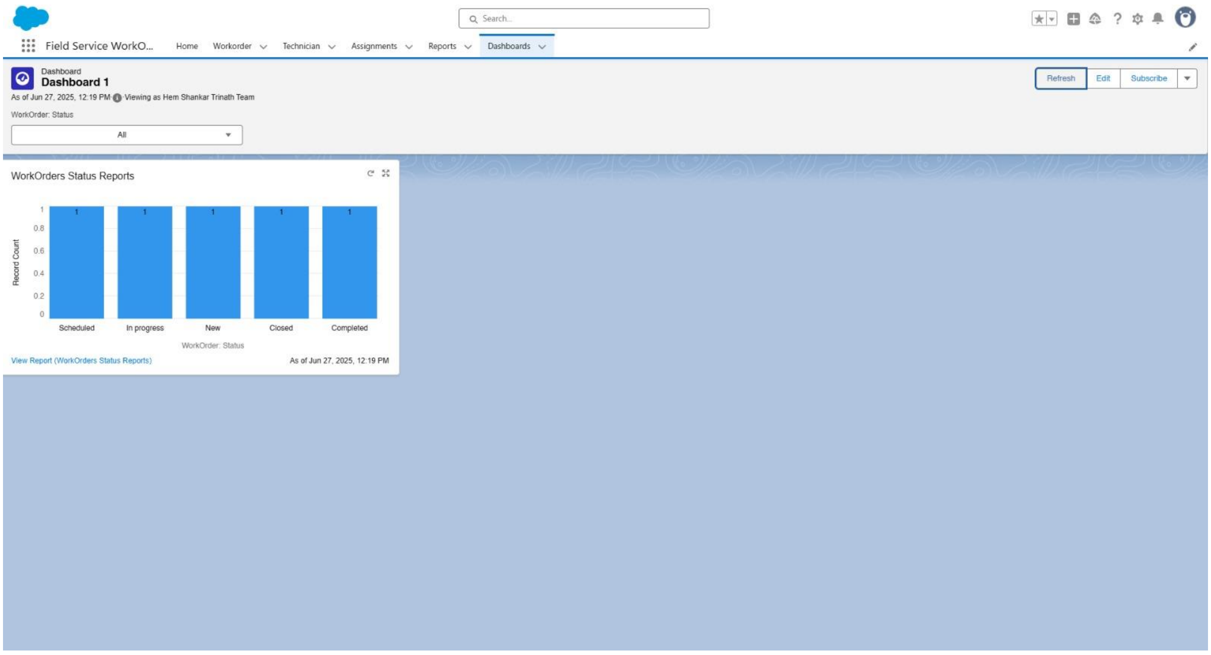
- **WorkOrder creation** and **technician auto-assignment** via Apex Trigger
- **Email alerts** sent upon WorkOrder assignment and completion
- **Scheduled Apex batch job** deleting resolved assignments older than 30 days
- Loading of **real-time dashboards** and **custom reports**



Report: Assignments with WorkOrder
WorkOrders Status Reports

Total Records
5

WorkOrder: Status ↑	WorkOrder: Amount ↑	Assignment: Assignment ID	WorkOrder: WorkOrder ID	Date	WorkOrder: Email	WorkOrder: Location	WorkOrder: Service Type	WorkOrder: Priority
□ Scheduled (1)	$250,000.00 (1)	A-0002	W-202	6/21/2025	sridurgaharshith@gmail.com	Warangal	Maintenance	Medium
	Subtotal							
Subtotal								
□ In progress (1)	$250,000.00 (1)	A-0003	W-203	6/21/2025	bunnygangadhar8@gmail.com	Pune	Hardware repair	low
	Subtotal							
Subtotal								
□ New (1)	$250,000.00 (1)	A-0004	W-204	6/21/2025	erothusadhivik@gmail.com	Nanded	Lane-Management	Medium
	Subtotal							
Subtotal								
□ Closed (1)	$250,000.00 (1)	A-0005	W-205	6/21/2025	example@gmail.com	Nasik	Troubleshoot/Debugging	low
	Subtotal							
Subtotal								
□ Completed (1)	$250,000.00 (1)	A-0001	W-201	6/21/2025	pitanihemanth9@gmail.com	Hyderabad	Machine Installation	High
	Subtotal							
Subtotal								
Total (5)								



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Testing Focus Areas

Performance testing was focused on validating key business operations most commonly used by end users. These included:

- **WorkOrder creation** and automatic technician assignment
- Execution of **Flows and Apex Triggers** (e.g., assignment logic, completion alerts)
- **Scheduled Apex jobs** for deleting old assignments (e.g., after 30 days)
- Loading and refreshing **dashboards and custom reports** with real-time metrics

---

Approach and Tools Used

Testing was conducted in the **Salesforce Sandbox** using test records designed to mimic real-world usage. Manual test cases were executed and monitored using:

- **Debug Logs**
- **Developer Console**
- **System Overview Tools** (to monitor governor limits, heap size, etc.)

Test scenarios simulated high-usage patterns, such as:

- Bulk creation of WorkOrders
- Trigger-based mass assignment and email alerts
- Running scheduled jobs on large datasets

- Dashboard refreshes with dynamic filters applied

Key performance indicators monitored:

- Page load and save times for records
- Execution duration of Flows and Apex logic
- Completion time of scheduled batch jobs
- Email delivery time after trigger events
- Report and dashboard loading latency

Results and Observations

The system handled standard and moderate workload scenarios efficiently:

- WorkOrders were created and assigned in real time
- Apex Triggers and Flows executed with no visible delays
- Email alerts were sent to Technicians promptly upon assignment
- Scheduled Apex jobs completed on schedule and processed data as expected
- Dashboards and reports loaded within seconds, even with applied filters

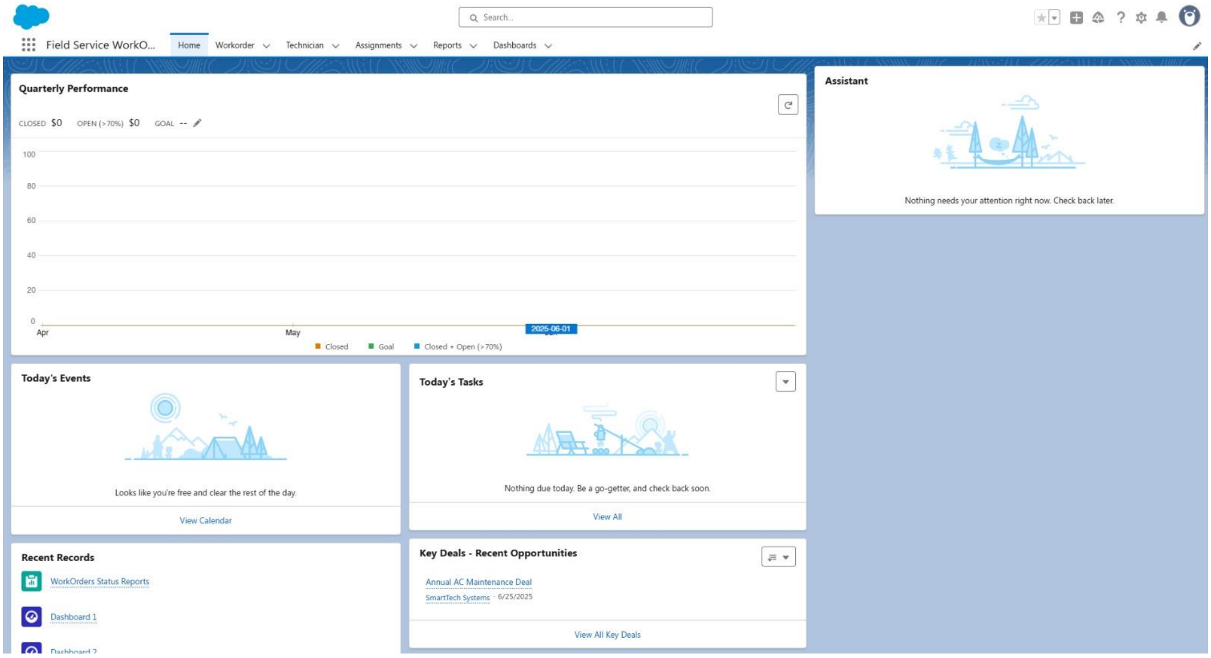
Minor delays were observed during **bulk WorkOrder imports**, which were resolved by:

- **Optimizing Flows** and formula conditions
- **Bulkifying Apex classes** and implementing governor limit best practices

These enhancements helped ensure that the system is **scalable**, **responsive**, and aligned with best practices for enterprise-grade performance.

8. RESULTS

8.1 Output Screenshots

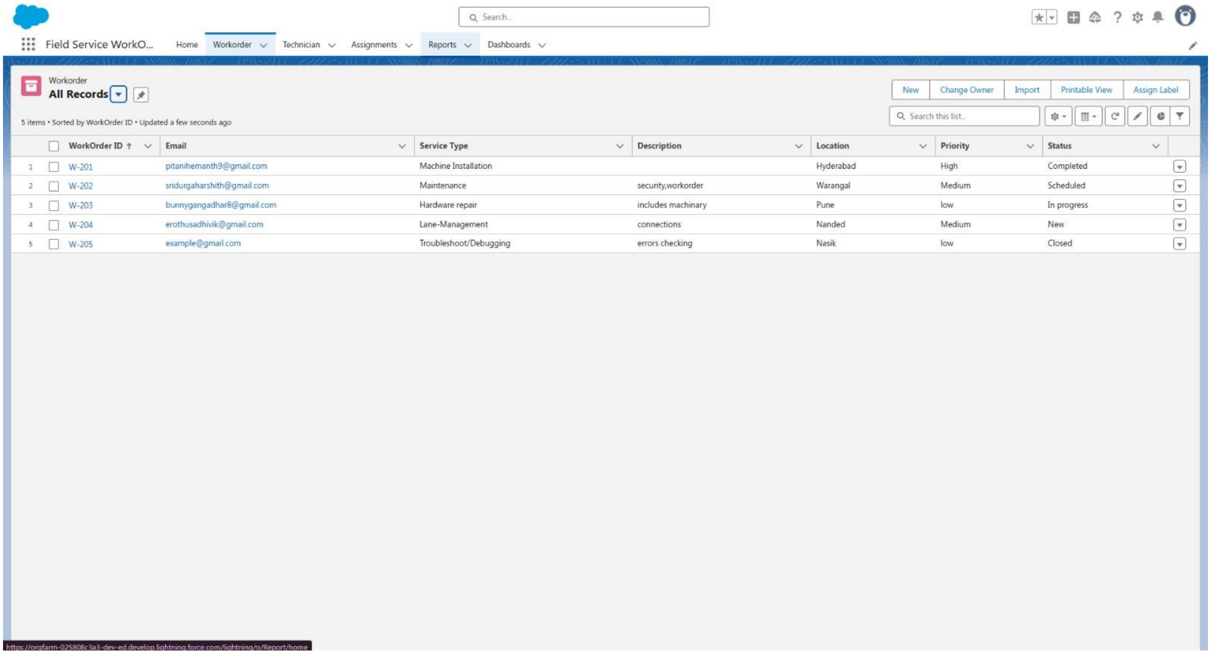


Nothing needs your attention right now. Check back later.

Looks like you're free and clear the rest of the day.

Nothing due today. Be a go-getter, and check back soon.

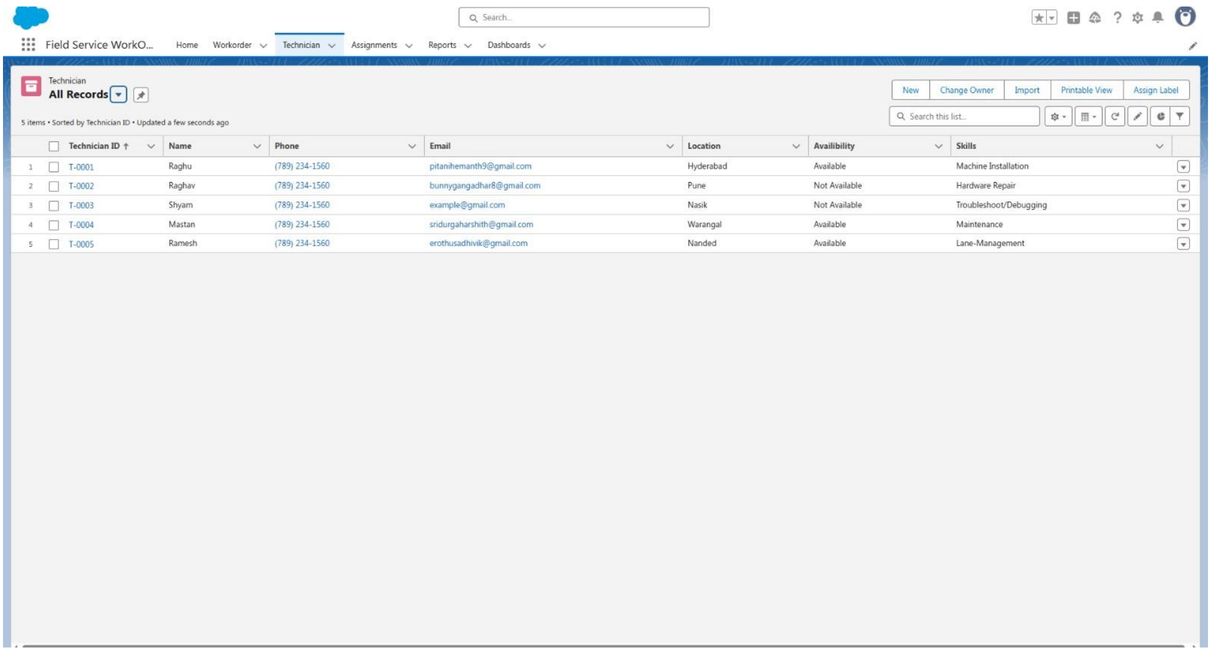
SmartTech Systems · 6/25/2025



5 items • Sorted by WorkOrder ID • Updated a few seconds ago

	WorkOrder ID ↑	Email	Service Type	Description	Location	Priority	Status
1	W-201	pitanihemanth9@gmail.com	Machine Installation		Hyderabad	High	Completed
2	W-202	sridurgaharshith@gmail.com	Maintenance	security,workorder	Warangal	Medium	Scheduled
3	W-203	bunnygangadhar8@gmail.com	Hardware repair	includes machinary	Pune	low	In progress
4	W-204	erothusadhivik@gmail.com	Lane-Management	connections	Nanded	Medium	New
5	W-205	example@gmail.com	Troubleshoot/Debugging	errors checking	Nasik	low	Closed

https://orgfarm-025808c3a3-dev-ed.develop.lightning.force.com/lightning/o/Report/home

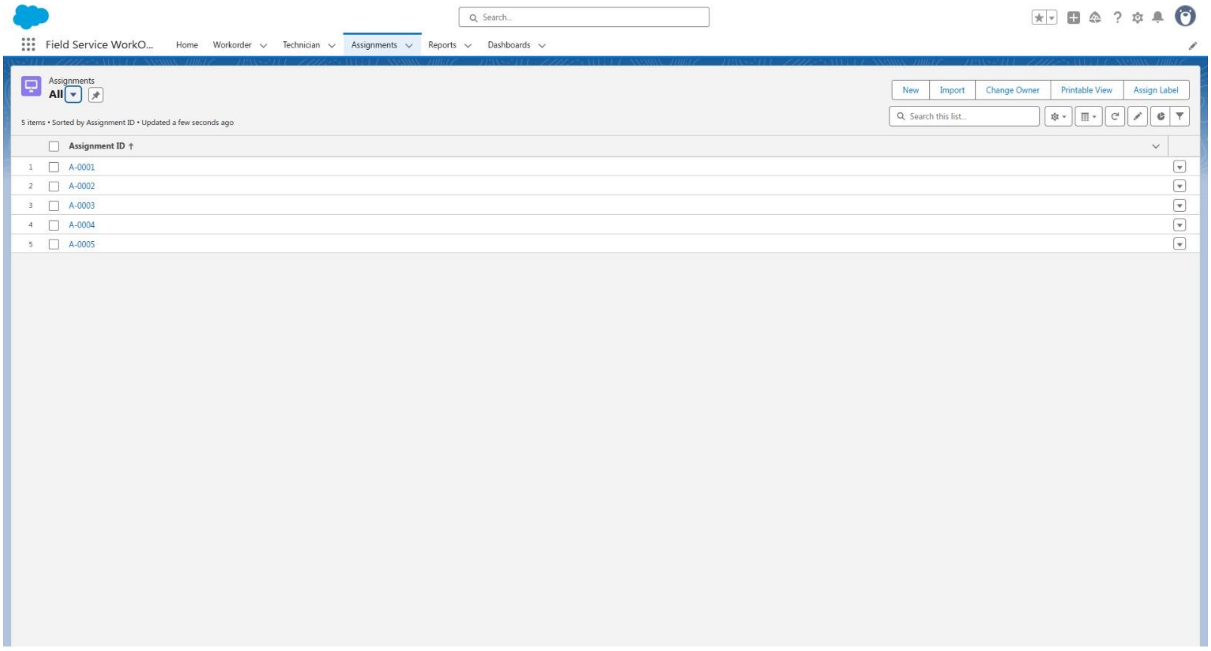


Technician

All Records

5 items • Sorted by Technician ID • Updated a few seconds ago

	Technician ID ↑	Name	Phone	Email	Location	Availibility	Skills
1	T-0001	Raghu	(789) 234-1560	pitanihemanth9@gmail.com	Hyderabad	Available	Machine Installation
2	T-0002	Raghav	(789) 234-1560	bunnygangadhar8@gmail.com	Pune	Not Available	Hardware Repair
3	T-0003	Shyam	(789) 234-1560	example@gmail.com	Nasik	Not Available	Troubleshoot/Debugging
4	T-0004	Mastan	(789) 234-1560	sridurgaharshith@gmail.com	Warangal	Available	Maintenance
5	T-0005	Ramesh	(789) 234-1560	erothusadhivik@gmail.com	Nanded	Available	Lane-Management

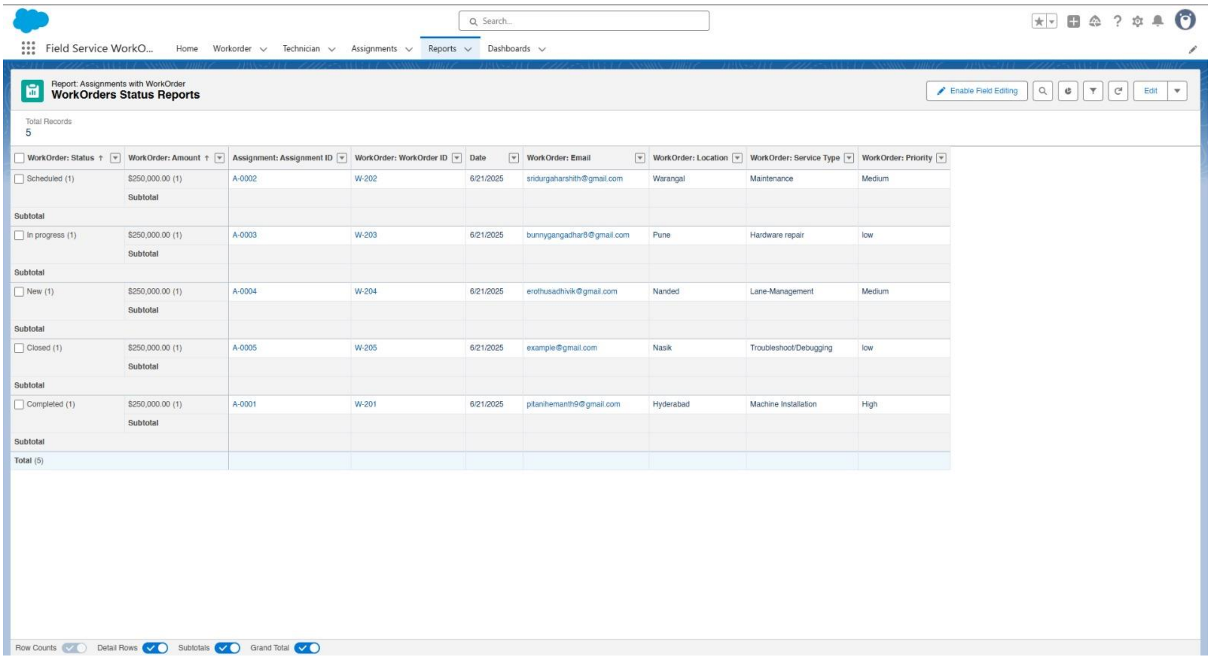


Assignments

All

5 items • Sorted by Assignment ID • Updated a few seconds ago

	Assignment ID ↑
1	A-0001
2	A-0002
3	A-0003
4	A-0004
5	A-0005

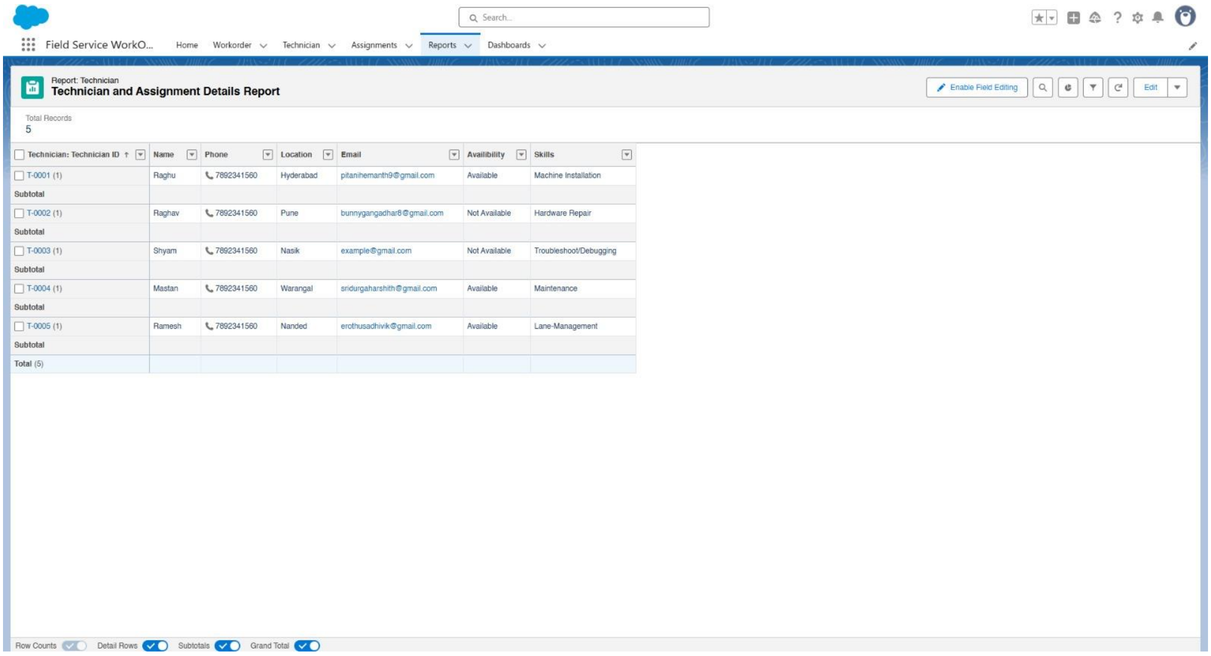


Report: Assignments with WorkOrder

WorkOrders Status Reports

Total Records
5

WorkOrder: Status ↑	WorkOrder: Amount ↑	Assignment: Assignment ID	WorkOrder: WorkOrder ID	Date	WorkOrder: Email	WorkOrder: Location	WorkOrder: Service Type	WorkOrder: Priority
□ Scheduled (1)	$250,000.00 (1)	A-0002	W-202	6/21/2025	sridurgaharshith@gmail.com	Warangal	Maintenance	Medium
	Subtotal							
Subtotal								
□ In progress (1)	$250,000.00 (1)	A-0003	W-203	6/21/2025	bunnygangadhar8@gmail.com	Pune	Hardware repair	low
	Subtotal							
Subtotal								
□ New (1)	$250,000.00 (1)	A-0004	W-204	6/21/2025	erothusadhivik@gmail.com	Nanded	Lane-Management	Medium
	Subtotal							
Subtotal								
□ Closed (1)	$250,000.00 (1)	A-0005	W-205	6/21/2025	example@gmail.com	Nasik	Troubleshoot/Debugging	low
	Subtotal							
Subtotal								
□ Completed (1)	$250,000.00 (1)	A-0001	W-201	6/21/2025	pitanihemanth9@gmail.com	Hyderabad	Machine Installation	High
	Subtotal							
Subtotal								
Total (5)								

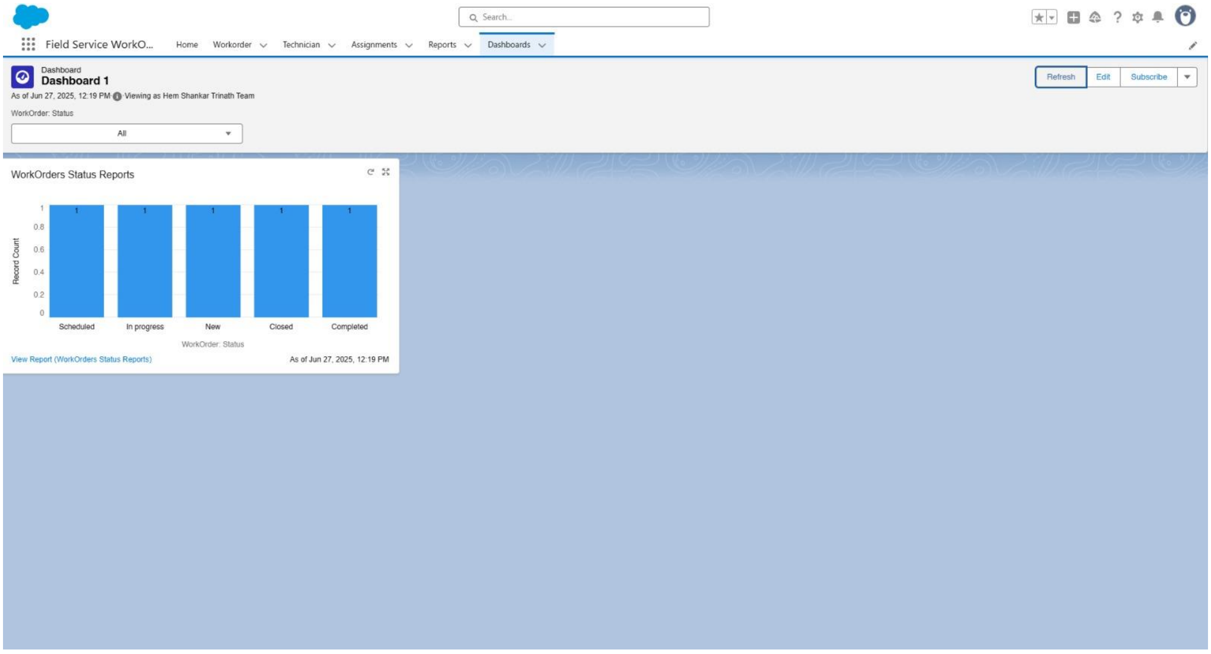


Report: Technician

Technician and Assignment Details Report

Total Records
5

Technician: Technician ID ↑	Name	Phone	Location	Email	Availibility	Skills
□ T-0001 (1)	Raghu	☎ 7892341560	Hyderabad	pitanihemanth9@gmail.com	Available	Machine Installation
Subtotal						
□ T-0002 (1)	Raghav	☎ 7892341560	Pune	bunnygangadhar8@gmail.com	Not Available	Hardware Repair
Subtotal						
□ T-0003 (1)	Shyam	☎ 7892341560	Nasik	example@gmail.com	Not Available	Troubleshoot/Debugging
Subtotal						
□ T-0004 (1)	Mastan	☎ 7892341560	Warangal	sridurgaharshith@gmail.com	Available	Maintenance
Subtotal						
□ T-0005 (1)	Ramesh	☎ 7892341560	Nanded	erothusadhivik@gmail.com	Available	Lane-Management
Subtotal						
Total (5)						



Dashboard

Dashboard 1

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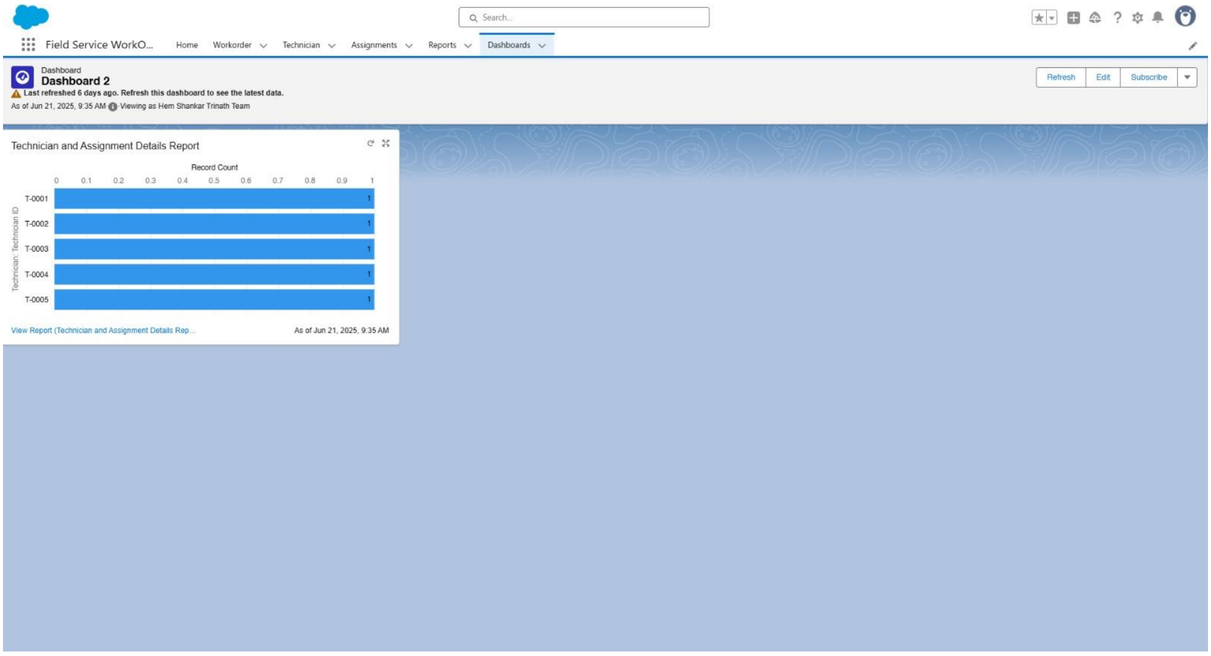
WorkOrder: Status

All

WorkOrders Status Reports

View Report (WorkOrders Status Reports)

As of Jun 27, 2025, 12:19 PM



Dashboard

Dashboard 2

⚠ Last refreshed 6 days ago. Refresh this dashboard to see the latest data.

As of Jun 21, 2025, 9:35 AM · Viewing as Hem Shankar Trinath Team

Technician and Assignment Details Report

View Report (Technician and Assignment Details Rep...

As of Jun 21, 2025, 9:35 AM

9. ADVANTAGES & DISADVANTAGES

Advantages

● **Automation of WorkOrder Assignment**
The system automatically assigns technicians to work orders based on location, skills, and availability, minimizing manual intervention and improving operational efficiency.

● **Centralized Service Data Management**
All technician, work order, and assignment records are stored securely in Salesforce, enabling better data accuracy and traceability.

● **Real-Time Notifications**
Email alerts are sent to technicians upon assignment and work order completion, ensuring timely communication and quick response.

● **Role-Based Access Control**
Custom profiles like "Technician" ensure that users can only access relevant objects and fields, enhancing data security.

● **Scalable and Customizable Platform**
Built on Salesforce Lightning, the system can be extended with new objects, flows, and automation features as business needs evolve.

● **Improved Service Insights**
Dynamic reports and dashboards provide real-time visibility into technician workload, work order statuses, and service coverage areas.

● **User-Friendly Interface**
The use of Lightning App, custom tabs, and guided layouts makes it easy for admins and technicians to navigate and manage records.

Disadvantages

● **Salesforce Platform Dependency**
The solution relies on Salesforce, requiring a license and platform access for all users.

● **Initial Setup and Configuration Overhead**
Creating custom objects, Apex classes, and automation logic takes initial time and planning.

● **No Native Offline Functionality**
Internet access is required to use the system; field agents may face issues in low-connectivity zones.

- **Learning Curve for Non-Technical Users**

Users unfamiliar with Salesforce may require training to use dashboards, reports, or update records.

- **Bulk Data Import Limitations**

Migrating large sets of technician or work order data may require tools like Data Loader and careful field mapping.

10. CONCLUSION:

The **Field Service Work Order Optimization** system has been successfully designed and developed on the Salesforce platform to automate and streamline technician assignments and service management workflows. By leveraging custom objects, Apex logic, and scheduled automation, the system replaces manual processes with dynamic, real-time functionality.

The solution meets all business and functional requirements—ensuring proper technician allocation, automated notifications, assignment tracking, and real-time performance reporting. It has been rigorously tested for functional accuracy and performance efficiency. The system is reliable, scalable, and ready for deployment in a real-world service environment.

11. FUTURE SCOPE

- Integrate real-time mapping or GPS tracking for technician routing
- Build advanced analytics dashboards for service performance KPIs
- Enable mobile-responsive Lightning pages for field accessibility
- Integrate chatbot support for customer or technician inquiries
- Expand with QR code scanning for work order updates onsite

12. APPENDIX

Source Code: Apex classes and triggers (WorkOrderClass, AssignmentEmail, CompletionMail, RecordDeletions, ScheduleClass & WorkOrderTrigger, AssignmentTrigger)

Apex Class: WorkOrderClass

```
public class WorkOrderClass {
    public static void workOrder(List<WorkOrder__C> newListWorkOrder){
        Map<Integer, List<String>> maptotech = new map<Integer,List<String>>();
        integer num = 0;
        List<WorkOrder__c> properWo = new List<WorkOrder__c>();
        List<Assignment__c> lstAssignment = new List<Assignment__c>();
        List<Technician__c> techniciantoAssignment = new List<Technician__c>();
        for(WorkOrder__c iter : newListWorkOrder){
            List<String> lststring = new List<string>();
            If(iter.Service_Type__c != null && iter.Location__c != null ){
                num = num+1;
                properWo.add(iter);
                lststring.add(iter.Service_Type__c);
                lststring.add(iter.Location__c);

                maptotech.put(num,lststring);
            }
        }
        Map<integer,Id> techId = new Map<integer,Id>();
        Map<Id,Technician__c> allTechnician = new Map<Id,Technician__c>([SELECT Id, Name, Phone__c, Location__c, Skills__c, Availibility__c, Name__c, Email__c FROM Technician__c]);
        integer num2 = 0;
        For(Technician__c T : allTechnician.values()){
            num2 = num2+1;
            if(maptotech.get(num2) != null){
                List<string> valofmap = maptotech.get(num2);
            system.debug('error 1 ----> the maptotech is empty ---> ' + maptotech.get(num2));
            if(valofMap.contains(t.Skills__c) && ValofMap.contains(t.Location__c) && t.Availibility__c == 'Available'){
                techid.put(num2,t.Id);
            }
            }

        }
        integer num3 = 0;
        For(WorkOrder__c W : properWo){
            num3 = num3 + 1;
            Assignment__c A = new Assignment__c();
            A.WorkOrder_ID__c = W.Id;
            A.Technician_ID__c = techid.get(num3);
            lstAssignment.add(A);
        }
        If(!lstAssignment.IsEmpty()){
            insert lstAssignment;
        }
    }
}
```

Apex Class: AssignmentEmail

```
public class AssigningEmail {
    public static void sendEmailmsg(List<Assignment__c> assRec){
        List<messaging.SingleEmailMessage> myVar = new List<messaging.SingleEmailMessage>();
        Map<id,Technician__c> tecnicians = new Map<id,Technician__c>([SELECT Id, Phone__c, Location__c, Skills__c, Name__c, Email__c, Availibility__c, Name FROM Technician__c]);
        try{
            for(Assignment__c con : assRec){
                if(con.Technician_ID__c != null){
                    messaging.SingleEmailMessage mail = new messaging.SingleEmailMessage();
                    List<String> sendTo = new List<String>();
                    sendTo.add(tecnicians.Get(con.Technician_ID__c).Email__c);
                    mail.setToAddresses(sendTo);
                    string subject = 'WorkOrder Assignment ';
                    mail.setSubject(subject);
                    string body = 'The following WorkOrder has been assigned to you ';
                    mail.setHTMLbody(body);
                    myVar.add(mail);
                }
            }
            Messaging.sendEmail(myvar);
        }
        catch(exception e){
            system.debug('Error -----> ' + e.getMessage());
        }
    }
}
```

Apex Class: CompletionMail

```
public class CompletionMail {
    public static void sendEmailMsg(List<WorkOrder__c> workOrderList){
        List<messaging.SingleEmailMessage> myVar = new List<messaging.SingleEmailMessage>();
        for(WorkOrder__c con : workOrderList){
            if(con.Status__c == 'Resolved'){
                messaging.SingleEmailMessage mail = new messaging.SingleEmailMessage();
                List<String> sendTo = new List<String>();
                sendTo.add(con.Email__c);
                mail.setToAddresses(sendTo);
                string subject = 'Status Updated';
                mail.setSubject(subject);
                string body = 'email body ';
                mail.setHTMLbody(body);
                myVar.add(mail);
            }
        }
        Messaging.sendEmail(myvar);
    }
}
```

Apex Class: RecordDeletions

```
public class RecordDeletions Implements Database.Batchable<Sobject>{
    public Database.QueryLocator start(Database.BatchableContext bc) {
            string query = 'SELECT Id, Name, WorkOrder_ID__c, Technician_ID__c, Assignment_Date__c, Completion_Date__c
            FROM Assignment__c WHERE Completion_Date__c = LAST_N_DAYS:30';
        return database.GetQueryLocator(query);
    }
    public void execute(Database.BatchableContext bc, List<Assignment__c> query){
        if(!Query.IsEmpty()){
            Delete Query;
        }
    }
    public void finish(Database.BatchableContext bc){
    }
}
```

Apex Class: ScheduleClass

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

Apex Triggers

Apex trigger: WorkOrderTrigger

```
trigger WorkOrderTrigger on WorkOrder__c (after insert) {
    if(trigger.isafter && trigger.isinsert){
        WorkOrderClass.workOrder(trigger.new);
    }
}
```

Apex trigger: AssignmentTrigger

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

Dataset Link: Not Applicable

GitHub & Project Demo Link:

https://github.com/Trinath0928/Field-Service-WorkOrder-Optimization

https://youtu.be/-0N5ShB1WyA?si=fsqPN-RAUKtO58UF