# **Salesforce Student Admission Management System**

#### **Problem Statement:**

Many colleges and universities still rely on manual processes, paper forms, and spreadsheets to manage admissions. These methods lead to inefficiencies, errors, and delays in the admission lifecycle. Applicants lack transparency and real-time updates, while admission officers struggle with high volumes, manual evaluations, and fragmented tracking of applications, enrollments, and fees.

Administrators also face challenges with limited analytics, making it hard to forecast trends or optimize resources. Legacy solutions often fail to provide the customization and unified experience institutions need.

This project addresses these issues by offering a cloud-based, automated platform that streamlines applications, supports structured decision workflows, automates enrollment tracking, and delivers actionable insights through reports and dashboards.

# Phase 1 (Problem Understanding & Industry Analysis):

# **Problem Understanding & Industry Analysis**

# • Requirement Gathering

Collected requirements from the perspective of a university admissions team: online student application, review workflow, enrollment tracking, and reporting needs.

# Stakeholder Analysis

Identified stakeholders such as Admission Officers, Faculty Reviewers, Students/Applicants, and Administrators, along with their roles and expectations in the admission lifecycle.

# Business Process Mapping

Mapped the end-to-end admission process starting from student application submission  $\rightarrow$  review & evaluation  $\rightarrow$  decision publishing  $\rightarrow$  enrollment confirmation.

# • Industry-specific Use Case Analysis

Researched admission challenges faced by educational institutions: high application volumes, manual data entry, lack of real-time tracking, and reporting inefficiencies.

# **Phase 2 (Org Setup & Configuration):**

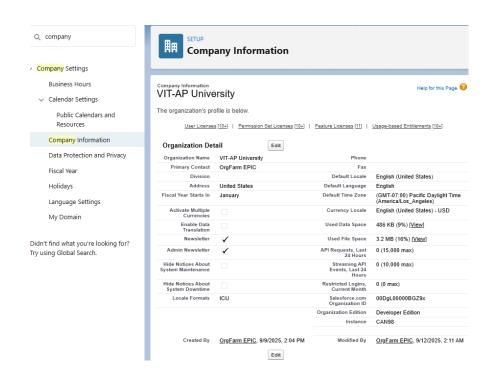
In this phase, the Salesforce Developer Org was configured to align with the requirements of the Student Admission Management System. Key configuration activities included:

#### • Salesforce Edition Selection

A Salesforce **Developer Edition** was used to build and test the project, as it provides core CRM features, customization, and LWC development capabilities at no cost.

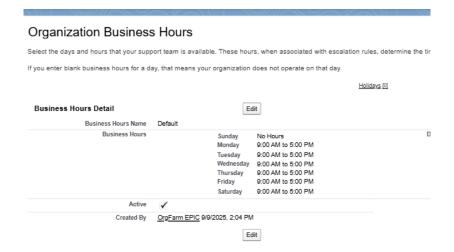
#### Company Profile Setup

The company profile was configured with institution details such as College/University name, locale, time zone, currency, and default language, ensuring consistency across records.



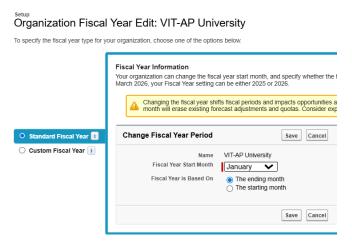
#### Business Hours & Holidays

Defined admission office working hours (9 to 5 and no working hours on sundays) and academic holidays can also be included to be used in workflows (like application submission SLAs or automated responses)



#### **Fiscal Year Settings**

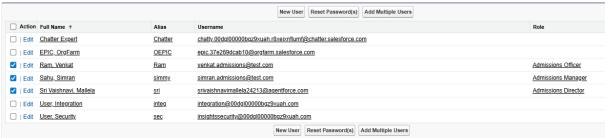
Configured fiscal year settings to align with the **academic calendar** for reporting admission data semester/annual basis.



#### **User Setup & Licenses**

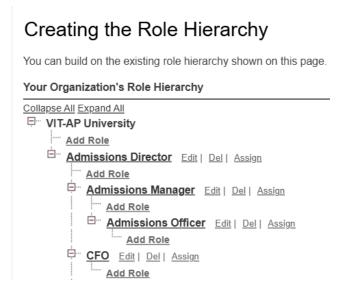
- Me (Mallela Sri Vaishnavi) → Admissions Director → Full access
- Simran Sahu (Admissions Manager) → Salesforce License
- Venkat Ram (Admissions Officer) → Salesforce License

# Active Users On this page you can create, view, and manage users. To get more licenses, use the Your Account app. Let's Go View: Active Users Edit | Create New View Action Full Name Alias Username



#### **Profiles & Roles**

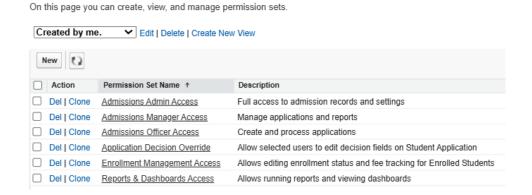
Configured **custom profiles** (e.g., Admission Officer, Student Counselor) and **role hierarchy** (University → Admissions Director → Admission Manager → Admission Officer) to reflect the institution's structure.



#### **Permission Sets**

Permission Sets provide extra access without changing user profiles.

#### Permission Sets



#### **Organization-Wide Defaults (OWD)**

Set baseline record-level security:

- Student Applications → **Private** (only owners & managers can see)
- Courses → **Private** (since they're institution-wide)
- Enrolled Students → **Private** (sensitive student details)

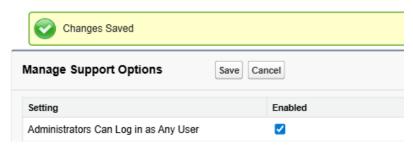


#### **Login Access Policies**

- Enabled Administrators can Log in as Any User.
- Allows Admin to test features as Admin (Director), Manger, Officer.

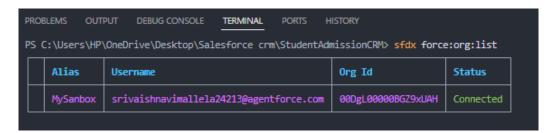
#### Login Access Policies

Control which support organizations your users can grant login access to



#### Dev Org Setup

Installed Salesforce CLI and linked VS Code to the Dev Org for metadata deployment and retrieval.



#### Deployment Basics

Learned deployment methods:

- Change Sets (Admin way)
- SFDX CLI & GitHub (Developer way, used in this project)

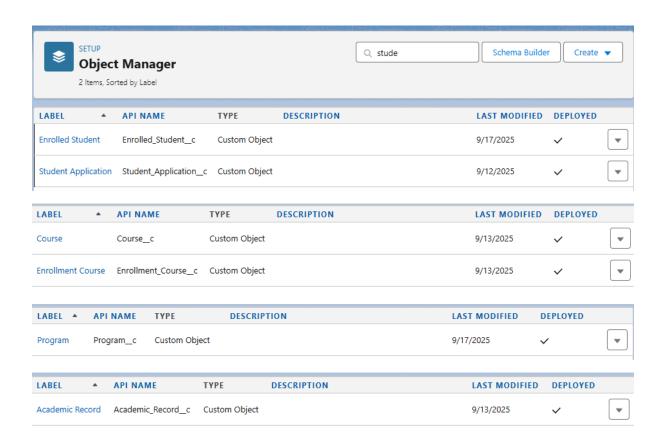
# **Phase 3 (Data Modelling & Relationships):**

#### **Standard & Custom Objects:**

• **Standard objects:** User, Contact for student contacts and admission officers.

## Custom objects:

- Student\_Application\_\_c stores student application details (name, DOB, email, GPA, program applied)
- Enrolled\_Student\_\_c tracks enrolled students and links to Student Application
- Course c stores available coursese
- Enrollment\_Course\_\_c junction object linking students to courses
- ∘ Program c stores programs offered by the institution
- Academic Records c stores student grades and transcripts



# **Fields:**

• Defined fields for each object using appropriate data types as follows:

# Student\_Application\_\_c:

Fields & Relationships 17 Items, Sorted by Field Label		
FIELD LABEL	FIELD NAME	DATA TYPE
Admission Officer	Admission_Officer_c	Lookup(User)
Applicant First Name	Applicant_First_Name_c	Text(80)
Applicant Full Name	Applicant Full Name c	Formula (Text)
Applicant Last Name	Applicant Last Name_c	Text(80)
Application Number	Name	Auto Number
Created By	CreatedByld	Lookup(User)
Date of Birth	Date_of_Birthc	Date
Decision Comments	Decision_Comments_c	Long Text Area(32000)
Email	Email_c	Email
High School GPA	High_School_GPAc	Number(3, 2)
Last Modified By	LastModifiedByld	Lookup(User)
Notes	Notes_c	Long Text Area(32768)
Owner	Ownerld	Lookup(User,Group)
Phone	Phone_c	Phone
Program	Program_c	Lookup(Program)
Status	Status_c	Picklist
Submitted Date	Submitted_Date_c	Date/Time

# **Enrolled\_Student\_c:**

# Fields & Relationships

FIELD LABEL A	FIELD NAME	DATA TYPE
Application	Application_c	Lookup(Student Application)
Created By	CreatedByld	Lookup(User)
End Date	End_Date_c	Date
Enrollment Number	Name	Auto Number
Enrollment Status	Enrollment_Status_c	Picklist
Fees Paid	Fees_Paidc	Currency(16, 2)
Last Modified By	LastModifiedByld	Lookup(User)
Name	Name_c	Text(30)
Owner	Ownerld	Lookup(User,Group)
Payment Status	Payment_Status_c	Picklist
Start Date	Start_Date_c	Date
Student Contact	Student_Contactc	Lookup(Contact)

# Course\_\_c:

#### Fields & Relationships

8 Items, Sorted by Field Label

FIELD LABEL	FIELD NAME	DATA TYPE
Course Code	Course_Code_c	Text(20)
Course Name	Name	Text(80)
Created By	CreatedByld	Lookup(User)
Credits	Credits_c	Number(2, 0)
Current Student Count	Current_Student_Countc	Number(18, 0)
Last Modified By	LastModifiedByld	Lookup(User)
Owner	Ownerld	Lookup(User,Group)
Program	Program c	Lookup(Program)

# Program\_c:

#### Fields & Relationships

10 Items, Sorted by Field Labe

FIELD LABEL	FIELD NAME	DATA TYPE
Active	Active_c	Checkbox
Created By	CreatedByld	Lookup(User)
Department	Department_c	Picklist
Description	Description_c	Long Text Area(32768
Duration (Months)	Duration_c	Number(3, 0)
Last Modified By	LastModifiedByld	Lookup(User)
Owner	Ownerld	Lookup(User,Group)
Program Code	Program_Codec	Text(20)
Program Name	Name	Text(80)
Tuition Fees	Tuition_Feesc	Currency(16, 2)

# Academic\_Record\_\_c:

#### Fields & Relationships

9 Items, Sorted by Field Label

FIELD LABEL	FIELD NAME	DATA TYPE
Academic Record Name	Name	Text(80)
Applicant	Applicant_c	Lookup(Student Application)
Created By	CreatedByld	Lookup(User)
Degree	Degree_c	Text(255)
GPA	GPA_c	Number(3, 2)
Institution	Institution_c	Text(255)
Last Modified By	LastModifiedByld	Lookup(User)
Owner	Ownerld	Lookup(User,Group)
Year Completed	Year_Completedc	Number(4, 0)

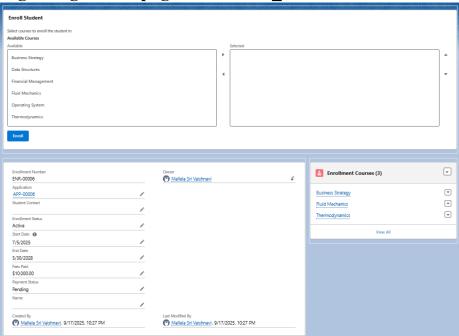
## **Record Types & Page Layouts:**

- Record types to differentiate program types or application types (optional).
- Customized page layouts for each object to show key fields:
  - Student\_Application→ applicant details, decision picklist, comments, uploaded documents
  - o Enrolled Student → enrollment info, fees, selected courses
  - → Home\_Page\_Default → Home Page layout of my App, consists of rich text, reports, recent records, list view, recent items, quicklinks.
- Compact layouts for mobile and Lightning pages for quick info access

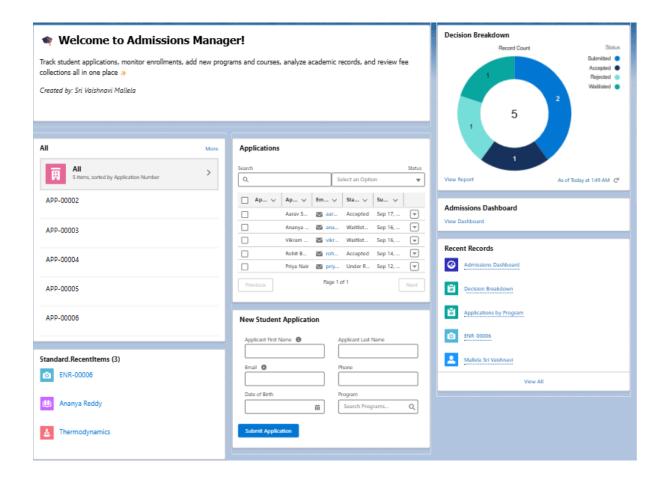
## **Lightning record page of Student Application:**



# **Lightning record page of Enrolled\_Student:**



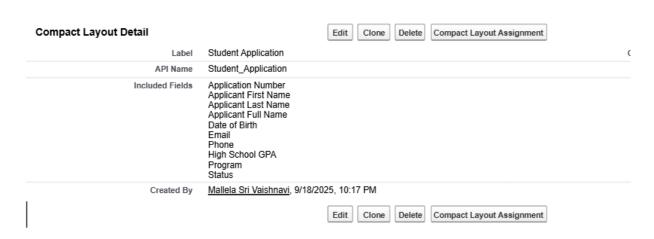
#### Lightning record of Home Page Default:



## **Compact Layout for mobile:**



« Back to Student Application



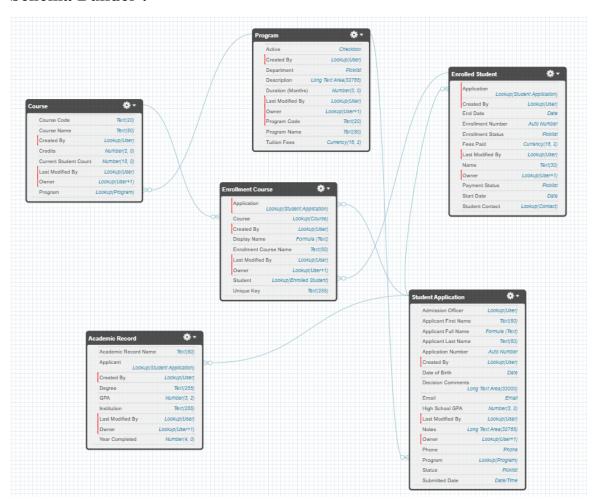
#### **Relationships:**

- Lookup and Master-Detail relationships:
  - Enrolled\_Student\_c → Student\_Application\_c : Lookup (required)
  - $\circ$  Enrollment\_Course\_\_c  $\rightarrow$  Enrolled\_Student\_\_c : Lookup
  - $\circ$  Enrollment\_Course\_c  $\rightarrow$  Course\_c : Lookup
  - $\circ$  Academic Records  $c \rightarrow Student$  c : Lookup
  - $\circ$  Academic Records  $c \rightarrow Course$  c : Lookup

# • Junction Objects:

• Enrollment\_Course\_\_c enables many-to-many tracking between students and courses.

#### Schema Builder:



# **Phase 4 (Process Automation (Admin)):**

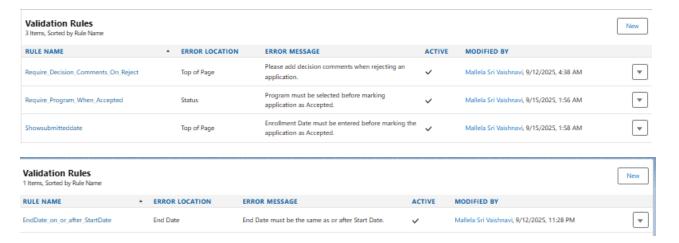
**Objective:** Automate repetitive administrative tasks in the admission lifecycle to ensure accuracy, save time, and provide a seamless applicant experience.

#### Validation Rules:

Ensured data quality and consistency in admission workflow.

- Implemented rules in **Student\_Application\_\_c**, **Academic\_Record\_\_c**, **Enrollment Course** object:
  - 1. **Require\_Decision\_Comments\_On\_Reject** Prevents rejecting an application unless decision comments are added.
    - Example: If Admission Officer tries to reject without filling
       Comments\_c, an error appears.
  - 2. **Require\_Program\_When\_Accepted** Forces the officer to select a **Program\_c** before marking the application as Accepted.
    - Example: Officer cannot approve without assigning a program.
  - 3. **Showsubmitteddate** Ensures **Enrollment\_Date\_\_c** is entered before marking the application as Accepted.
    - Example: Students cannot be accepted without enrollment date filled.
  - 4. Validate\_GPA\_Range Ensures GPA entered is between 0.0 and 4.0.
    - Example: Prevents saving record if GPA = 4.5 or GPA = -1.
  - EndDate\_on\_or\_after\_StartDate -- Used in Courses / Programs to validate date ranges.
    - Example: Prevents creating a course/program with an End Date earlier than Start Date.





#### **Workflow Rules:**

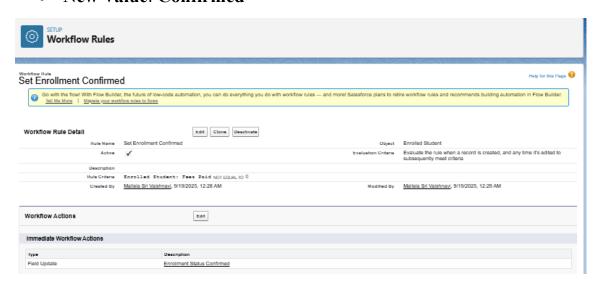
#### **Set Enrollment Status to Confirmed**

- **Objective**: Automatically update a student's enrollment status once the admission fee is paid.
- Object: Enrolled Student c
- Evaluation Criteria: Rule runs when a record is created, and every time it's edited to meet the condition.
- Rule Criteria:

 $\circ$  Fee\_Paid\_\_c = TRUE

# Field Update Action: Enrollment Status Confirmed

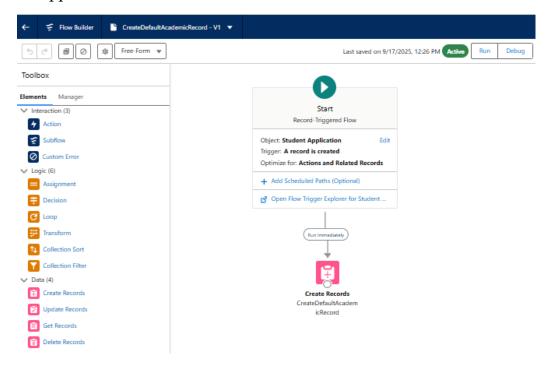
- Action Name: Enrollment Status Confirmed
- Field to Update: Enrollment\_Status\_c
- New Value: Confirmed



#### Flow Builder:

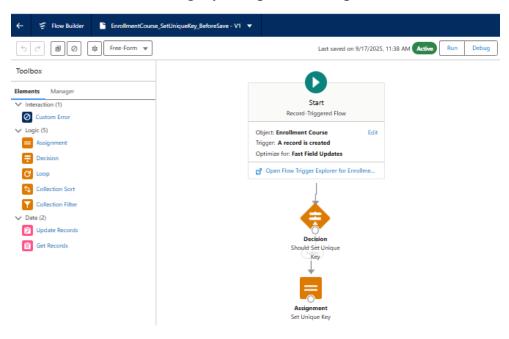
# 1) CreateDefaultAcademicRecord (Autolaunched Flow)

• Automatically creates a default academic record when a new student application is submitted.



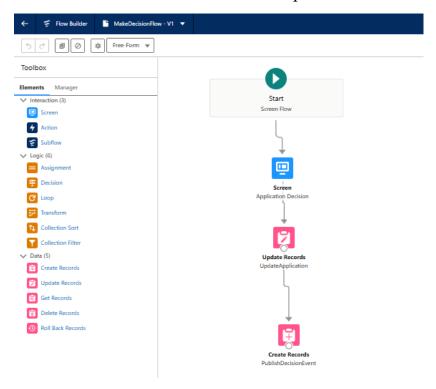
# 2) EnrollmentCourse\_SetUniqueKey\_BeforeSave (Autolaunched Flow)

- Generates a unique key for each enrollment-course record before save.
- Ensures data integrity and prevents duplicates.



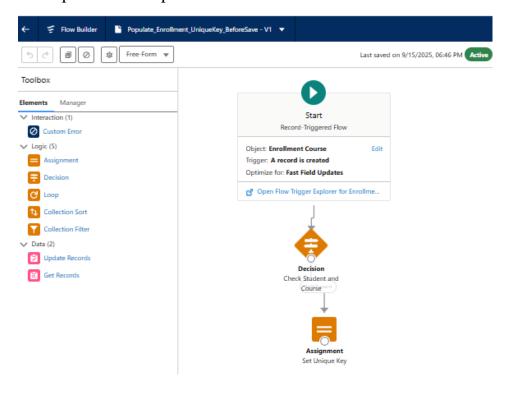
#### 3) MakeDecisionFlow (Screen Flow)

- Guided screen flow for admission officers to mark applications as Accepted, Rejected, or Waitlisted.
- Collects decision comments and updates the record.



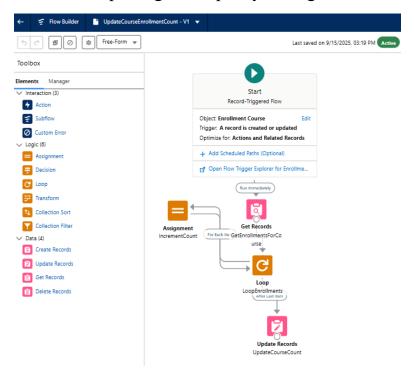
# 4) Populate\_Enrollment\_UniqueKey\_BeforeSave (Autolaunched Flow)

• Populates a unique identifier on enrollment records at save time.



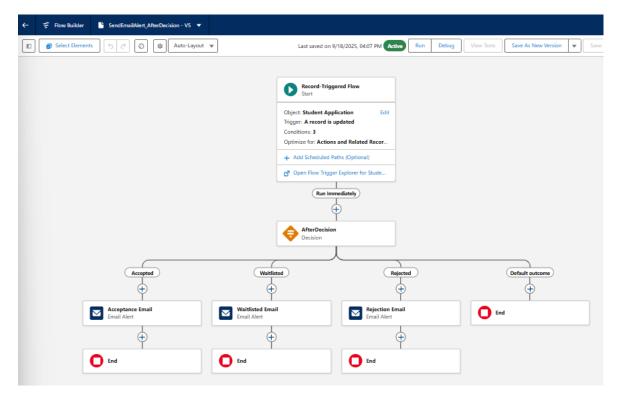
# 5) UpdateCourseEnrollmentCount (Autolaunched Flow)

- Updates the number of enrolled students whenever enrollment changes.
- Useful for reporting and capacity management.



# 6) SendEmailAlert\_AfterDecision (Autolaunched Flow)

• Sends an acceptance / rejection / waitlist email to applicants after a decision is made.



# **Email Templates in Project:**

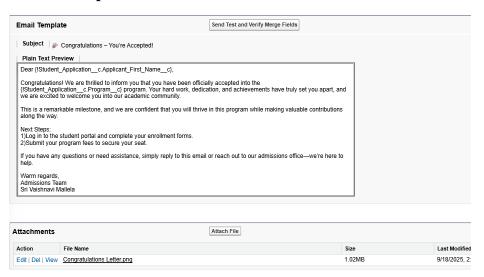
To ensure timely and consistent communication with applicants, **Email Templates** were configured and connected to Flows/Email Alerts.



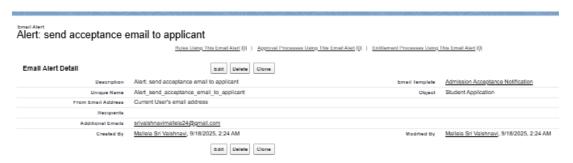
#### **Implemented Templates**

- Admission Acceptance Notification
  - Type: Text
  - Purpose: Sent automatically when an applicant is marked Accepted

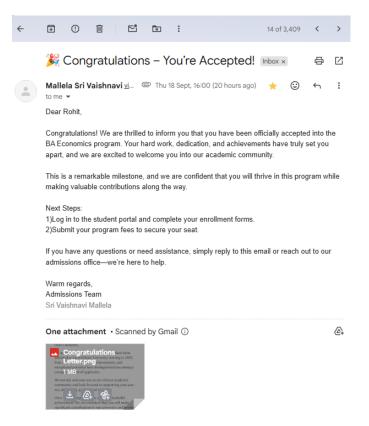
#### **Email Template:**



#### **Email Alert:**



#### **Email Notification:**

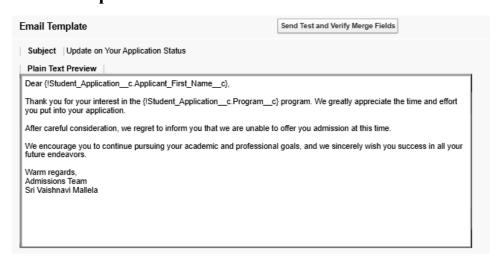


#### Admission Rejection Notification

o **Type:** Text

• Purpose: Sent when an applicant's status changes to Rejected.

#### **Email Template:**



#### **Email Alert:**



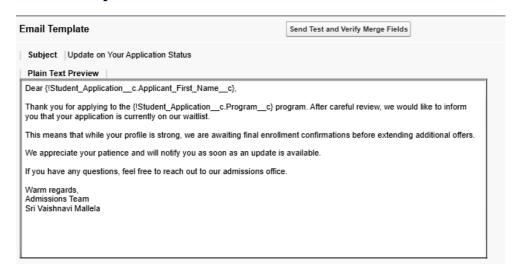
#### **Email Notification:**



#### Admission Waitlisted Notification

- o **Type:** Text
- o **Purpose:** Sent when an applicant is **Waitlisted**, giving transparency to students about their status.

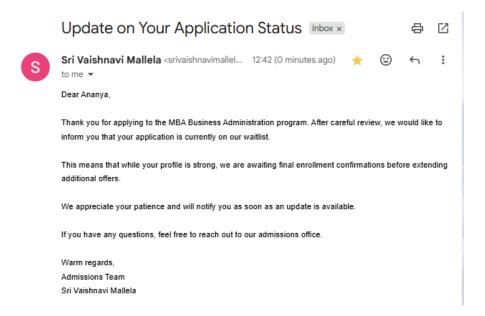
#### **Email Template:**



#### **Email Alert:**



#### **Email Notification:**

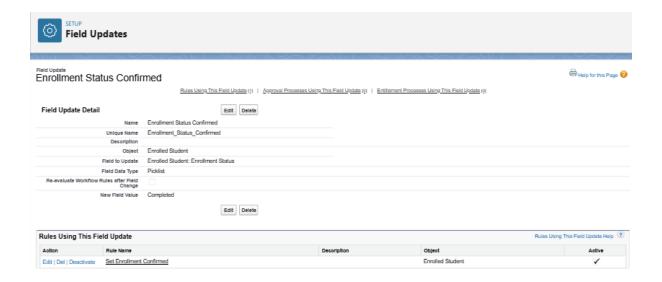


# **Field Updates:**

- Enrollment Status Confirmed
  - Action Name: Enrollment Status Confirmed
  - **Object**: Enrolled Student c
  - Field to Update: Enrollment Status c
  - Operation: Update field value
  - New Value: Completed

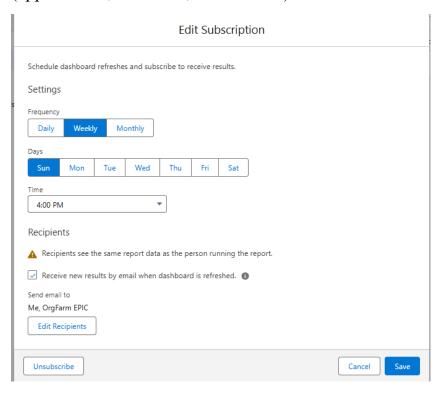
#### **Purpose:**

- Ensures that once the workflow condition (e.g., Fee Paid = true) is satisfied, the student's enrollment record is automatically updated.
- Reduces manual intervention for the admissions team.



# **Custom Notifications:**

Weekly dashboard subscriptions were set up to email key admission metrics (applications, decisions, enrollments) to Admissions team members.



# **Phase 5 (Apex Programming)- Developer**

# **Classes & Objects:**

- Classes are blueprints for logic, containing methods and variables.
  - In this project, we created:
  - AdmissionDecisionPublisher → Publishes admission decisions and updates student application records.

#### **Apex Code:**

```
nPublisher.apxc ApplicationListController.apxc ApplicationListControllerTest.apxc EnrollmentController.apxc EnrollmentCont
Code Coverage: None • API Version: 64 •
1 * public with sharing class AdmissionDecisionPublisher {
                     @AuraEnabled
3
                   public static void publishDecision(Id studentAppId, String decision, String comments) {
5 🕶
                          if (studentAppId == null) {
6
                                         throw new AuraHandledException('studentAppId is required');
8
                              // Fetch the application
10 •
                              Student_Application__c app = [
                                        SELECT Id, Status_c, Program_c
11
12
                                         FROM Student_Application__c
13
                                         WHERE Id = :studentAppId
                                        LIMIT 1
14
15
16
17
                               // Optional validation: ensure Program is selected if Accepted
                             if (decision == 'Accepted' && app.Program__c == null) {
18 🕶
                                         throw new AuraHandledException('Program must be selected before marking application as Accepted.')
19
20
21
22
                              // Update the Student Application record
                               app.Status__c = decision;
                              app.Decision_Comments__c = comments;
24
25
                              update app;
26
27
                              // Publish the platform event
                              Application_Decision__e evt = new Application_Decision__e(
29
                                        Application_Id__c = String.valueOf(studentAppId),
30
                                         Decision__c = decision,
                                         Officer_Id__c = UserInfo.getUserId(),
31
                                         Comments__c = comments,
32
33
                                         Decision_Date__c = System.now()
35
                               EventBus.publish(evt);
36
37 }
```

**Test class for AdmissionDecisionPublisher:** 

```
Code Coverage: None • API Version: 64 •
 1 @IsTest
 2 * public class AdmissionDecisionPublisherTest {
          static void testPublishDecision_updatesRecordAndPublishesEvent() {
              Program__c prog = new Program__c(Name='Test Program');
              insert prog;
              // Create Student Application
 10
              Student_Application__c app = new Student_Application__c(
                  Applicant_First_Name__c = 'Test',
Applicant_Last_Name__c = 'User',
 13
                  Email_c = 'test@example.com',
Program_c = prog.Id,
 16
                  Submitted_Date__c = System.now()
              insert app:
 18
              Test.startTest();
AdmissionDecisionPublisher.publishDecision(
                   'Accepted'
                   'Good performance'
              Test.stopTest():
 28 🕶
             Student_Application__c updatedApp = [
                  SELECT Id, Status_c, Decision_Comments_c
                   FROM Student_Application__c
                   WHERE Id = :app.Id
            1;
              {\tt System.assertEquals('Accepted', updatedApp.Status\_c);}
              System.assertEquals('Good performance', updatedApp.Decision_Comments__c);
```

• **ApplicationListController** → Provides list view functionality for Student Applications in LWC.

#### **Apex Code:**

```
age: None • API Version: 64 •
public with sharing class ApplicationListController {
    public class PaginatedResult {
         @AuraEnabled public List<Student_Application_c> records;
         @AuraEnabled public Integer totalSize;
    @AuraEnabled(cacheable=true)
    public static PaginatedResult getApplications(Integer pageSize, Integer pageNumber, String statusFilter) {
        if (pageSize == null || pageSize <= 0) pageSize = 10;
if (pageNumber == null || pageNumber <= 0) pageNumber = 1;
         Integer offsetVal = (pageNumber - 1) * pageSize;
         List<Student_Application__c> apps;
         Integer total = 0;
         if (String.isBlank(statusFilter)) {
                 SELECT Id, Applicant_First_Name__c, Applicant_Last_Name__c,
                         Email__c, Status__c, Submitted_Date__c
                 FROM Student_Application__c
                 ORDER BY Submitted_Date__c DESC
                 LIMIT :pageSize OFFSET :offsetVal
             total = [SELECT COUNT() FROM Student_Application__c];
        } else {
             apps = [
                 SELECT Id, Applicant_First_Name__c, Applicant_Last_Name__c,
                 Email__c, Status__c, Submitted_Date__c
FROM Student_Application__c
                 WHERE Status_c = :statusFilter
ORDER BY Submitted_Date__c DESC
                 LIMIT :pageSize OFFSET :offsetVal
             total = [SELECT COUNT() FROM Student_Application_c where Status_c = :statusFilter];
         PaginatedResult res = new PaginatedResult();
        res.records = apps;
res.totalSize = total;
```

## Test class for ApplicationListController:

```
de Coverage: None 💌 API Version: 64 💌
  @IsTest
 private class ApplicationListControllerTest {
       @IsTest static void testGetApplications_pagination() {
           List<Student_Application__c> apps = new List<Student_Application__c>();
           Program__c prog = new Program__c(Name='Test Program');
           insert prog;
           for (Integer i = 0; i < 12; i++) {
               apps.add(new Student_Application__c(
                   Applicant_First_Name__c = 'Fn' + i,
Applicant_Last_Name__c = 'Ln' + i,
                    Email__c = 'test' + i + '@example.com',
                   Program__c = prog.Id,
Status__c = 'Submitted',
                   Submitted_Date__c = System.now()
               ));
           insert apps;
           Test.startTest();
           ApplicationListController.PaginatedResult res =
               ApplicationListController.getApplications(5, 1, null);
           Test.stopTest();
           System.assertNotEquals(null, res);
           System.assert(res.records.size() <= 5, 'Should return at most 5 apps');</pre>
           System.assert(res.totalSize >= 12, 'Total size should count all apps');
```

• EnrollmentController → Manages enrolling accepted students into courses.

#### **Apex Code:**

```
onDecisionPublisher.apxc * ApplicationListController.apxc * ApplicationListControllerTest.apxc * EnrollmentController.a
Coverage: None • API Version: 64 •
public with sharing class EnrollmentController {
      @AuraEnabled
      public static List<Enrollment_Course__c> enrollCourses(Id studentId, List<Id> courseIds) {
         if (studentId == null || courseIds == null || courseIds.isEmpty()) {
              return new List<Enrollment_Course__c>();
          // Get the Enrolled Student record to find its Application c
         Enrolled_Student__c enrolled = [
             SELECT Id, Application__c
              FROM Enrolled_Student__c
             WHERE Id = :studentId
              LIMIT 1
         List<Enrollment Course c> inserts = new List<Enrollment Course c>();
          for (Id cId : courseIds) {
             inserts.add(new Enrollment_Course__c(
                  Student\_c = studentId,
                  Course c = cId.
                  Application__c = enrolled.Application__c
              ));
          insert inserts;
         return inserts;
     @AuraEnabled(cacheable=true)
     public static List<Course__c> getCourses() {
         return [SELECT Id, Name FROM Course_c ORDER BY Name LIMIT 500];
```

#### **Test class for EnrollmentController:**

```
ode Coverage: None 💌 API Version: 64 💌
  @isTest
public class EnrollmentControllerTest {
       static void testEnrollCourses_createsEnrollments() {
           // Step 1: Create Enrolled Student (Name auto-number, no value needed)
           Enrolled_Student__c student = new Enrolled_Student__c();
           insert student:
           // Step 2: Create Courses
           Course_c c1 = new Course_c(Name='Course 1');
Course_c c2 = new Course_c(Name='Course 2');
           insert new List<Course__c>{c1, c2};
           // Step 3: Call the method under test
           Test.startTest();
           List<Enrollment_Course__c> enrollments = EnrollmentController.enrollCourses(
               student.Id,
               new List<Id>{c1.Id, c2.Id}
           Test.stopTest();
           // Step 4: Verify enrollments were created
           System.assertEquals(2, enrollments.size(), 'Two enrollments should be created');
           for (Enrollment_Course__c ec : enrollments) {
               System.assertEquals(student.Id, ec.Student_c, 'Student ID should match');
```

Overall Code Coverage		<b>&gt;</b>
Class	Percent	Lines
Overall	94%	
AdmissionDecisionPublisher	100%	17/17
ApplicationListController	77%	14/18
EnrollmentController	100%	15/15

# Apex Triggers (before/after insert/update/delete)

- Triggers allow automation when records are created/updated.
- Example (not in my project at the moment, but possible extension):
  - A trigger on Student\_Application\_\_c can set Status\_\_c = 'Under Review' when a new record is created.
  - Another trigger can enforce validation (e.g., program must be selected before status = Accepted).

# **Trigger Design Pattern**

• To avoid logic directly in triggers, we use **Trigger Handler Classes**.

- Example: Instead of putting logic in a before update trigger for Student\_Application\_\_c, call methods in a separate handler class like ApplicationTriggerHandler.
- Benefits: Cleaner code, easier testing, reusability.

#### **SOQL & SOSL**

- SOQL (Salesforce Object Query Language):
  - Used in controllers to fetch records.
  - Example in ApplicationListController and in other classes also.

```
List<Student_Application__c> apps;
Integer total = 0;
if (String.isBlank(statusFilter)) {
       SELECT Id, Applicant_First_Name__c, Applicant_Last_Name__c,
              Email__c, Status__c, Submitted_Date__c
       FROM Student Application c
       ORDER BY Submitted_Date__c DESC
       LIMIT :pageSize OFFSET :offsetVal
   1;
   total = [SELECT COUNT() FROM Student_Application__c];
} else {
   apps = [
       SELECT Id, Applicant_First_Name__c, Applicant_Last_Name__c,
              Email__c, Status__c, Submitted_Date__c
       FROM Student_Application__c
       WHERE Status__c = :statusFilter
       ORDER BY Submitted Date c DESC
       LIMIT :pageSize OFFSET :offsetVal
   1;
   total = [SELECT COUNT() FROM Student_Application_c WHERE Status_c = :statusFilter];
```

# • SOSL (Salesforce Object Search Language):

- Useful for searching across multiple objects at once.
- o Example: Searching applications by applicant name or email.

# Collections: List, Set, Map

- **List:** Ordered collection (used to store multiple application records).
- Set: Stores unique values (used to avoid duplicate student IDs).

• Map: Key-value pairs (e.g., mapping Course Id  $\rightarrow$  Course Name).

In my project:

- **EnrollmentController** might use a List<Enrollment\_Course\_\_c> for bulk insert.
- ApplicationListController can use Map<Id, Student\_Application\_\_c> to optimize queries.

#### **Control Statements**

- Apex supports if-else, for, while, and switch.
- Example from tests:

```
if (studentId == null || courseIds == null || courseIds.isEmpty()) {
    return new List<Enrollment_Course_c>();
}

for (Id cId : courseIds) {
    inserts.add(new Enrollment_Course_c(
        Student_c = studentId,
        Course_c = cId,
        Application_c = enrolled.Application_c
    ));
}
```

# **Batch Apex**

- Used for processing large data in chunks.
- Example extension for your project:
  - Batch job to update status of all applications pending for more than 30 days.

# **Queueable Apex**

- Supports async jobs with chaining.
- Example extension:
  - Queueable job to send bulk acceptance/rejection emails after decisions

# **Scheduled Apex**

- Run jobs at specific times.
- Example extension:
  - A scheduled job every Sunday to generate weekly admission statistics.

#### **Future Methods**

- Used for async processing of callouts or heavy tasks.
- Example extension:
  - @future method to send an external notification (to an external system) when an application is accepted.

# **Exception Handling**

- Apex supports try-catch-finally.
- In AdmissionDecisionPublisher, if update fails due to missing program, an exception is thrown.

```
try {
    update app;
} catch(DmlException e) {
    System.debug('Error while updating: ' + e.getMessage());
}
```

#### **Test Classes**

- Required to validate logic and ensure coverage.
- In your repo:
  - AdmissionDecisionPublisherTest → Tests decision publishing logic.
  - ApplicationListControllerTest → Tests pagination and retrieval of applications.
  - o **EnrollmentControllerTest** → Tests course enrollment logic.

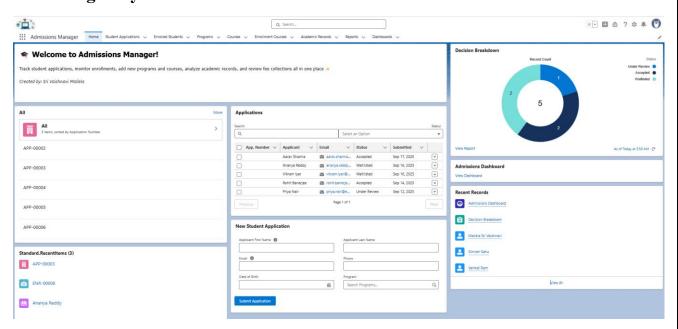
Salesforce requires ≥75% code coverage for deployment to production.

# **Phase 6 (User Interface Development):**

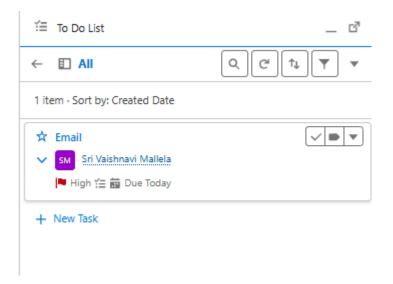
# **Lightning App Builder**

- Built a **custom Admission Management App** with navigation for Applications, Students, Courses, and Enrollment, Academic Records etc.
- Added Record Pages, Home Pages, Tabs, and Utility Bar using Lightning App Builder.

## **Home Page Layout:**



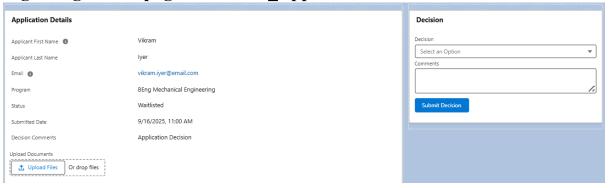
# **Utility Bar – To Do List:**



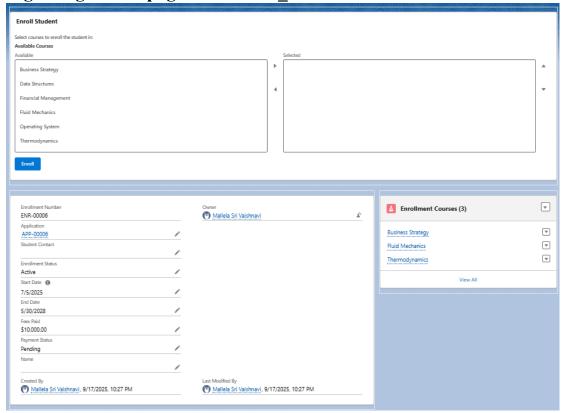
# **Record Pages**

- Created a custom record page for Student Application object.
- Components: Application details, related list (enrollment, decisions), and highlights panel.

Lightning record page of Student\_Application:

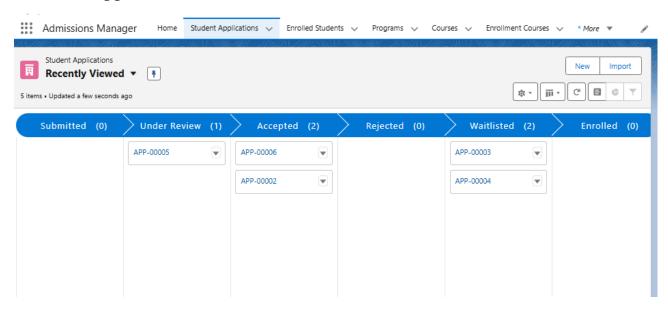


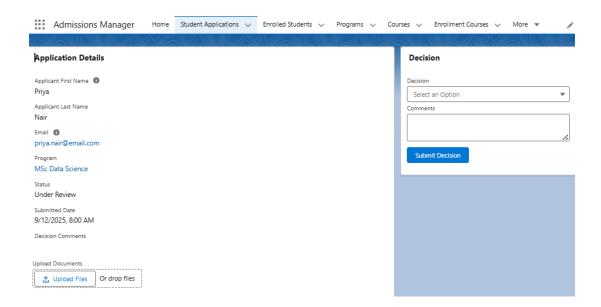
• Lightning record page of Enrolled\_Student:



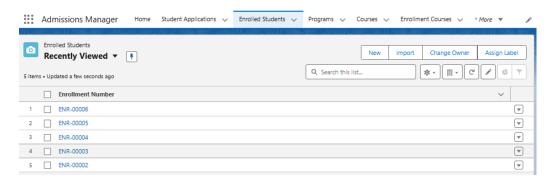
#### Tabs:

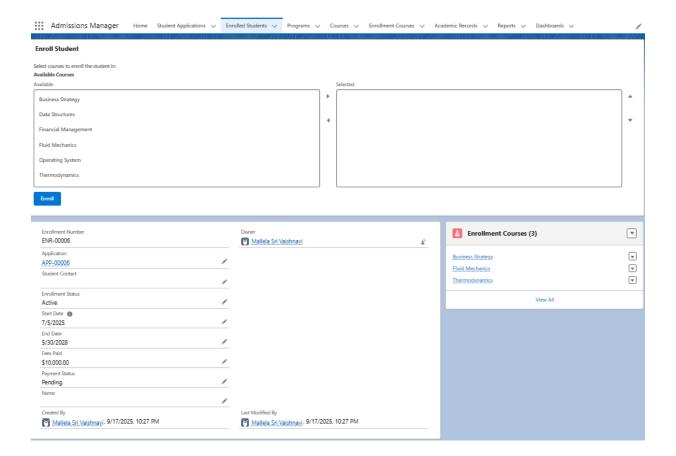
. Student Applications tab



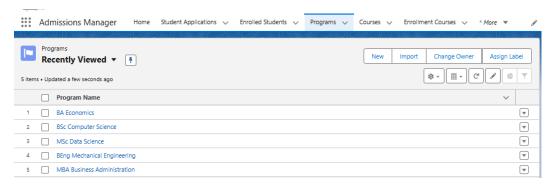


#### . Enrolled Students tab

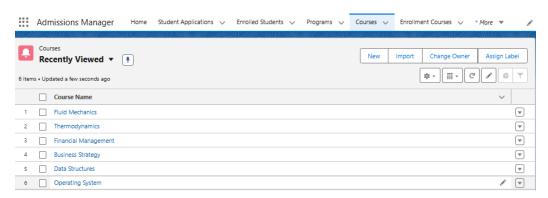




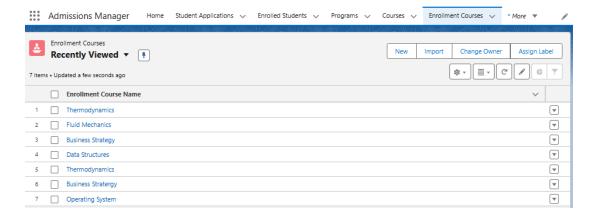
#### . Programs tab



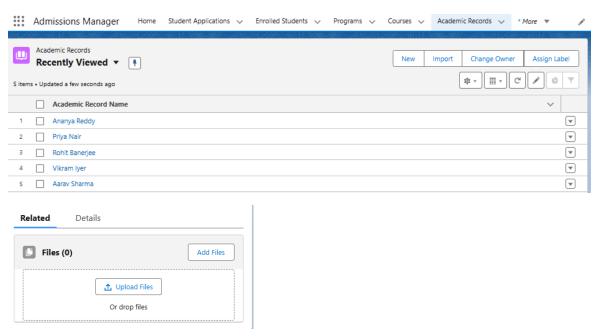
#### . Courses tab



#### . Enrollment Courses tab



#### . Academic Records tab



#### **Apex with LWC**

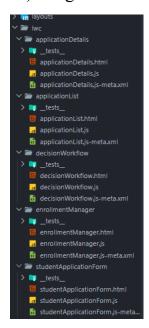
LWCs were integrated with **Apex controllers** to handle complex business logic and data operations that go beyond declarative tools.

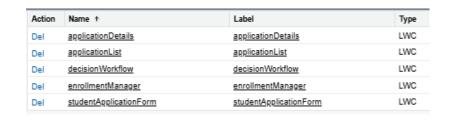
#### **Examples in Project:**

- **studentApplicationForm** → Calls Apex to insert new applications into Salesforce.
- **decisionWorkflow** → Invokes Apex to publish platform events and send notifications after a decision is made.
- enrollmentManager → Uses SOQL in Apex to fetch related enrollments and update fee statuses.

# **Lightning Web Components (LWC)**

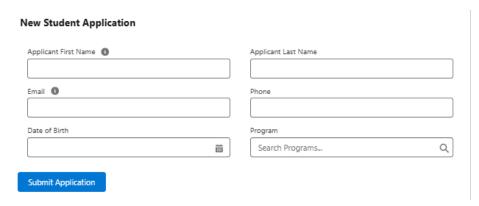
In this project, **Lightning Web Components (LWCs)** were built to provide a modern, responsive, and user-friendly interface for managing the student admission lifecycle. LWCs leverage standard web technologies (HTML, JS, CSS) integrated with Salesforce data.



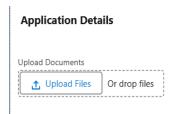


## **Key LWCs Developed:**

• **studentApplicationForm** → Allows applicants to submit personal, academic, and program details.



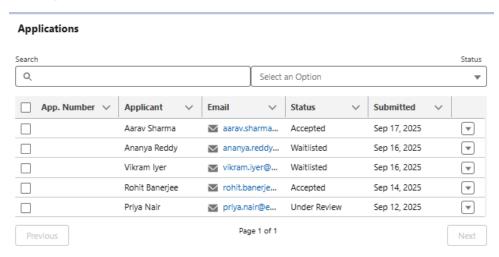
• applicationDetails → Shows detailed application records for review.



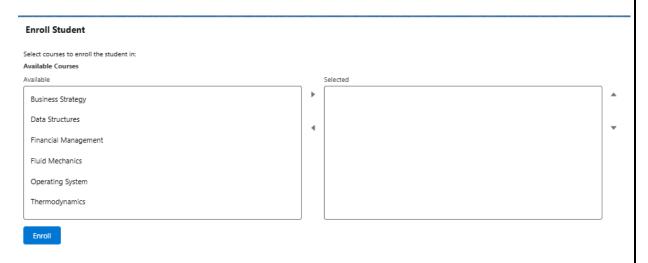
• **decisionWorkflow** → Enables admission officers to accept, reject, or waitlist applications.



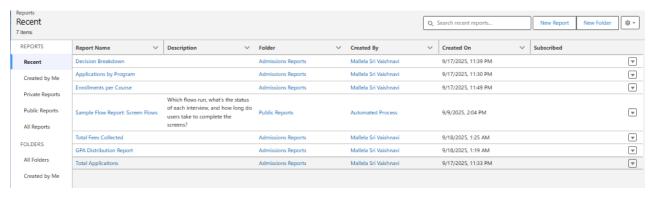
 applicationList → Displays submitted applications with filtering and sorting for officers.



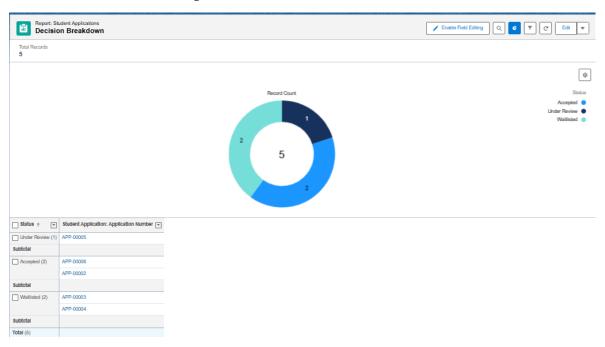
• **enrollmentManager** → Helps track enrollments, fee status, and course allocations.



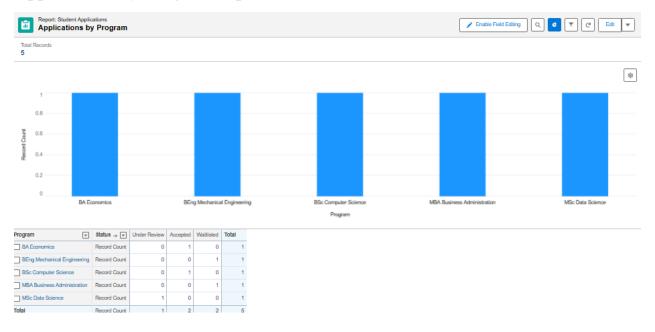
## **Reports:**



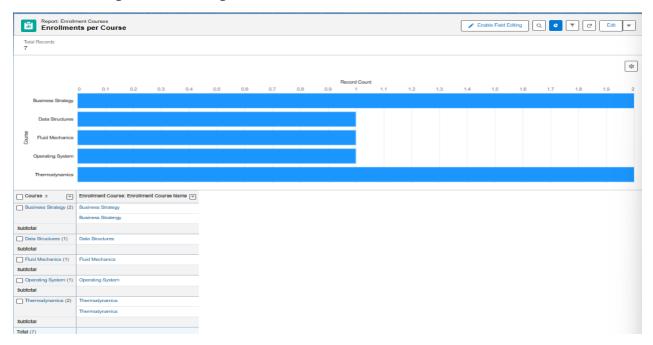
# **Decision Breakdown report:**



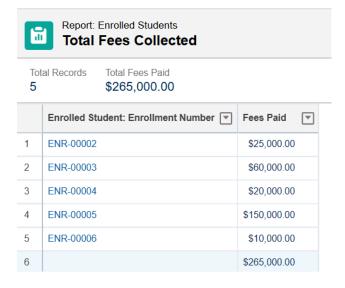
# **Applications by Program report:**



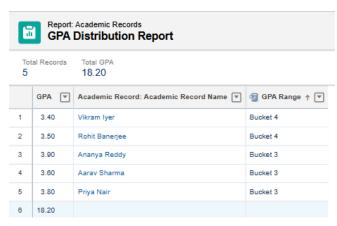
#### **Enrollments per course report:**



# **Total fees collected report:**



# **GPA Distribution report:**



# <u>Phase 7 (Integration & External Access) –</u> <u>Not integrated in Project</u>

#### **Named Credentials**

Named Credentials provide a secure and simplified way to call external APIs without storing authentication details in Apex code. They bundle the endpoint URL and authentication in one place, so developers only need to reference them in callouts.

- **Usage:** Used for integrating with third-party services such as payment gateway APIs to verify student fee payments.
- **Key Benefit:** Centralized management of authentication and endpoints, reducing hardcoding and increasing security.

#### **External Services**

External Services allow Salesforce to connect with APIs described by an OpenAPI/Swagger specification and automatically generate Apex actions or Flow actions. This enables both developers and admins to leverage APIs

- **Usage:** Used to integrate with external services such as document verification APIs (for verifying student identity, certificates, or test scores).
- **Key Benefit:** Exposes external system functionality inside Salesforce, which can then be directly used in Flows to automate admission processes.

# Web Services (REST/SOAP)

Salesforce supports consuming and exposing web services using REST and SOAP protocols. REST is commonly used for lightweight and modern integrations, while SOAP is still supported for legacy systems.

• Usage: REST services can be used for sending student admission data to external analytics platforms. SOAP services can be used for exchanging admission decisions with traditional ERP systems.

• **Key Benefit:** Enables Salesforce to work seamlessly with both modern and legacy applications.

#### **Callouts**

Apex callouts allow Salesforce to send HTTP requests to external services and process responses. They can be synchronous (real-time) or asynchronous.

- **Usage:** Used for confirming online payment transactions, checking scholarship eligibility, or fetching course details from external academic systems.
- **Key Benefit:** Enables Salesforce to stay connected with external data sources, ensuring accurate information during admission workflows.

#### **Platform Events**

Platform Events enable an event-driven architecture by allowing apps to publish and subscribe to custom events.

- Usage: When an admission decision (Accept, Reject, Waitlist) is made, a Platform Event can notify the student portal and trigger external notification services like SMS or email systems.
- **Key Benefit:** Provides real-time, asynchronous communication across Salesforce and external systems.

# **Change Data Capture (CDC)**

Change Data Capture publishes real-time events whenever records in Salesforce are created, updated, deleted, or undeleted. External systems can subscribe to these events.

- Usage: When a student updates their contact details or when an application status changes, the external systems like the university's master student database are updated immediately.
- **Key Benefit:** Ensures synchronization of data across Salesforce and external systems without manual intervention.

#### **Salesforce Connect**

Salesforce Connect allows Salesforce to access external data sources in real-time without importing or storing the data in Salesforce.

- **Usage:** Used to access a student's past academic history from the university's external database without duplicating records in Salesforce.
- **Key Benefit:** Reduces storage costs, avoids redundancy, and provides upto-date external data on demand.

#### **API Limits**

Salesforce enforces API request limits based on the edition and user licenses to maintain performance and system stability.

- Usage: The Student Admission CRM must carefully monitor API usage when performing frequent callouts for payment verification, document checks, and integration with third-party apps.
- **Key Benefit:** Helps manage integrations efficiently while staying within Salesforce's governor limits.

#### **OAuth & Authentication**

OAuth 2.0 is a secure, token-based authentication mechanism used for connecting Salesforce with external apps. It allows apps to access Salesforce data without exposing user credentials.

- Usage: Used when connecting Salesforce with student self-service portals, learning management systems (LMS)
- **Key Benefit:** Provides secure, scalable, and industry-standard authentication for integrated apps.

# **Remote Site Settings**

Remote Site Settings whitelist external endpoints so Salesforce can send callouts to them. This was the traditional approach before Named Credentials.

- Usage: Used for integrations with legacy services such as SMS gateways or APIs that do not require advanced authentication.
- **Key Benefit:** Protects Salesforce from sending data to unauthorized or untrusted endpoints.

# Phase 8 (Data Management & Deployment)

## **Data Import Wizard**

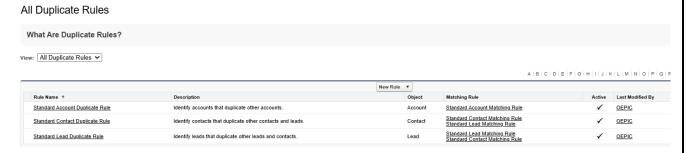
- Browser-based tool to import up to 50,000 records.
- Supports standard/custom objects with field mapping and duplicate prevention.
- Used by Admissions Manager to upload new applications, academic records, or program/course details received offline.

#### Data Loader

- Desktop client to handle large volumes of records (millions).
- Supports insert, update, upsert, delete, and export.
- Used for migrating historical applications, bulk updating fee statuses, or exporting enrollment data for audits.

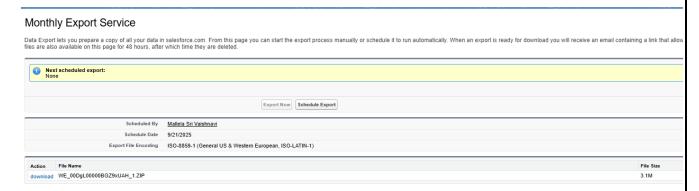
#### **Duplicate Rules**

- Works with Matching Rules to prevent duplicate records.
- Can block duplicates or allow with alerts.
- Ensures no duplicate student records are created when the same applicant reapplies with the same email or ID.



# Data Export & Backup

- Provides manual and scheduled export of Salesforce data.
- Exports records into CSV files bundled in .zip.
- Weekly/monthly backups ensure secure storage of student applications, enrollments, and course allocations for compliance.



#### **Change Sets**

- Moves metadata (not data) between environments like Sandbox → Production.
- Ensures tested configurations are promoted safely.
- Used to deploy workflows, approval processes, and Lightning Pages like Application Details from Sandbox to Production.

#### **Unmanaged vs Managed Packages**

- *Unmanaged:* Customizable after installation, used internally.
- *Managed*: Locked, used for distributing polished apps (AppExchange).
- Unmanaged Package used to share Admission CRM internally; Managed Package if released commercially as an educational solution.

# **ANT Migration Tool**

- Java/command-line tool to script deployments.
- Used to automate deployment of LWCs, triggers, and Apex classes (e.g., decisionWorkflow) from Sandbox to Production.

#### VS Code & SFDX

- Modern development environment for Salesforce.
- SFDX enables scratch orgs, push/pull metadata, testing, and deployments.
- Used to build and deploy LWCs like studentApplicationForm, applicationList, and enrollmentManager with version control integration.

