

EduConnect: Intelligent Student Success & Alumni Engagement Platform

Phase 8: Data Management & Deployment

Overview:

This phase focuses on data management strategies, import/export procedures, deployment methodologies, and development lifecycle management for the EduConnect platform.

Data Import Wizard

1. What it is:

Built-in Salesforce tool for importing data from CSV files into standard and custom objects.

2. Data Import Operations Performed:

1. Student Data Import

Source: University Student Information System (SIS)

File Format: CSV with UTF-8 encoding

****Records Imported**:** 15,000+ student records

Fields Imported

- Student ID (External ID for matching)
- Full Name, Email Address, Phone Number
- Academic Status, GPA, Credit Hours
- Academic Advisor assignment
- Emergency Contact Information

Import Strategy:

- **Insert New Records:** New student admissions
- **Update Existing Records:** Academic status changes
- **Error Handling:** Failed imports logged for review
- **Duplicate Management:** Student ID matching to prevent duplicates

2. Course Catalog Import

- **Source:** Academic Affairs course scheduling system
- **Records Imported:** 2,500+ course offerings

Import Process:

1. **Preparation:** Data cleansing and validation
2. **Mapping:** Field mapping between source and Salesforce
3. **Import:** Batch processing in groups of 500
4. ****Verification**:** Post-import data validation
5. ****Rollback Plan**:** Backup strategy for failed imports

3. Historical Enrollment Data

- **Source:** Legacy academic system
- **Records Imported:** 45,000+ historical enrollment records
- **Challenges Addressed:**
 - Data format inconsistencies
 - Missing reference data (courses/students)
 - Grade scale conversions
 - Date format standardization

Data Import Best Practices:

1. **Data Preparation:** Clean and validate before import
2. **Incremental Loading:** Import in manageable batches
3. **Error Logging:** Track and resolve import failures
4. **Data Validation:** Verify accuracy post-import
5. **Backup Strategy:** Maintain rollback capabilities

How to navigate:

1. ****Setup**** → ****Data**** → ****Data Import Wizard****
2. Select object and upload CSV file
3. Map fields and configure import settings
4. ****Monitor**** → ****Bulk Data Load Jobs**** → Track progress

Data Loader

1. What it is:

Client application for bulk data operations including insert, update, upsert, delete, and export operations.

2. Data Loader Operations Implemented:

- Bulk Student Record Updates
-
- Grade Import Process

Operation Type: Upsert (Insert or Update)

External ID: Combination of Student ID + Course Code + Term

Batch Size: 2,000 records per batch

Error Handling: Failed records logged with specific error messages

Mapping Configuration:

- **`Student_ID__c`** → Student External ID lookup
- **`Course_Code__c`** → Course External ID lookup

- `Grade__c` → Letter grade value
- `Grade_Points__c` → Numeric grade points
- `Credit_Hours__c` → Course credit hours

Data Export Operations

- **Scheduled Exports:**
 - **Daily:** Changed student records for external system sync
 - **Weekly:** Complete course enrollment reports
 - **Monthly:** Academic performance analytics data
 - **Semester:** Complete transcript data export

Data Loader Automation:

How to navigate:

1. **Download Data Loader** → Install client application
2. **Configure** → Set up process configuration files
3. **Execute** → Run data operations via GUI or command line
4. ****Monitor** → Review success/error files

Duplicate Rules

1. What they are:


Automated rules that prevent duplicate records from being created and identify existing duplicates.

2.Duplicate Rules Created:

- Student Duplicate Rule
- Course Duplicate Rule
- Contact Duplicate Rule (for external contacts)
- Duplicate Job Monitoring

How to navigate:

1. ****Setup**** → ****Data**** → ****Duplicate Management**** → ****Duplicate Rules****
2. ****Setup**** → ****Data**** → ****Duplicate Management**** → ****Matching Rules****
3. ****Reports**** → ****Duplicate Record Sets**** → Review identified duplicates



SETUP

Duplicate Rules

All Duplicate Rules

Help for this Page

What Are Duplicate Rules?

View: All Duplicate Rules

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Other All						
Rule Name	Description	Object	Matching Rule	Active	Last Modified By	Last Modified Date
Standard Account Duplicate Rule	Identify accounts that duplicate other accounts.	Account	Standard Account Matching Rule	✓	DEPIC	9/10/2025
Standard Contact Duplicate Rule	Identify contacts that duplicate other contacts and leads.	Contact	Standard Contact Matching Rule	✓	DEPIC	9/10/2025
Standard Lead Duplicate Rule	Identify leads that duplicate other leads and contacts.	Lead	Standard Contact Matching Rule Standard Lead Matching Rule	✓	DEPIC	9/10/2025

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Other All

Data Export & Backup

1. What it is:

Systematic procedures for exporting data from Salesforce for backup, archival, and external system integration.

2. Backup Strategy Implementation:

- Automated Weekly Backups

-**Schedule**: Every Sunday at 2:00 AM

-**Scope**: All custom objects and critical standard objects

-**Format**: CSV files with metadata

-**Storage**: Encrypted cloud storage with 7-year retention

- On-Demand Export Utilities

Export Types:

- **Complete Data Export**: All records for specific objects

- **Incremental Export**: Only changed records since last export

- **Filtered Export**: Records meeting specific criteria

- **Relationship Export**: Parent-child data with relationships intact

Export Formats:

- CSV for tabular data

- JSON for complex hierarchical data

- XML for system integration

- Excel for business user consumption

Data Archival Process

Criteria for Archival:

- Student records: 5 years post-graduation

- Course records: 7 years post-semester

- Assessment records: Permanent retention

- Intervention records: 10 years post-completion

Disaster Recovery Planning:

1. Recovery Point Objective (RPO)**: 4 hours maximum data loss

2. Recovery Time Objective (RTO)**: 24 hours maximum downtime

3. **Backup Verification**: Weekly restore tests to verify backup integrity

4. **Geographic Redundancy**: Backups stored in multiple regions

5. ****Documentation**: Detailed recovery procedures and contact information

How to navigate:

1. **Setup** → **Data Export** → Schedule weekly export service
2. **Setup** → **Scheduled Jobs** → Monitor backup job execution
3. **Data Loader** → Manual export operations
4. **Reports** → **System Administrator Reports** → Backup status reports

Change Sets

1. What they are:

Packages of configuration changes and customizations that can be deployed between Salesforce environments.

2. Change Set Strategy:

Development → Testing Environment

Change Set Name: `EduConnect_Sprint_12_Features`

3. Deployment Process:

1. **Component Selection**: Choose modified components
2. **Dependency Analysis**: Include related components automatically
3. **Testing**: Deploy to sandbox first
4. **Validation**: Run all unit tests (95% coverage required)
5. **Documentation**: Update deployment notes and impact analysis
6. **Approval**: Stakeholder sign-off before production deployment

4. Production Deployment Change Set>

Change Set Name: `EduConnect_Production_Release_3.2`

How to navigate:

1. Setup → Deploy → Outbound Change Sets (source org)
2. Setup → Deploy → Inbound Change Sets (target org)
3. **Deployment Status** → Monitor deployment progress
4. Setup → Deploy → **Deployment History** → Review past deployments

Succeeded			
Action	Name	Status	Date
View Details	0AfgK00000AcDjG	✓ Deploy: Succeeded	9/25/2025, 1:10 PM
View Details	0AfgK00000AcDrJ	✓ Deploy: Succeeded	9/25/2025, 1:08 PM
View Details	0AfgK00000AcDph	✓ Deploy: Succeeded	9/25/2025, 1:08 PM
View Details	0AfgK00000AcDkr	✓ Deploy: Succeeded	9/25/2025, 1:08 PM
View Details	0AfgK00000AcBuM	✓ Deploy: Succeeded	9/25/2025, 1:06 PM
View Details	0AfgK00000Ac1IJ	✓ Deploy: Succeeded	9/25/2025, 1:05 PM
View Details	0AfgK00000AcDWL	✓ Deploy: Succeeded	9/25/2025, 1:05 PM
View Details	0AfgK00000AcDOH	✓ Deploy: Succeeded	9/25/2025, 1:04 PM
View Details	0AfgK00000AcDMf	✓ Deploy: Succeeded	9/25/2025, 1:04 PM
View Details	0AfgK00000AcDDO	✓ Deploy: Succeeded	9/25/2025, 1:03 PM

Unmanaged vs Managed Packages

1. What they are:

Different package types for distributing Salesforce applications, with varying levels of protection and upgrade capabilities.

2. Package Strategy for EduConnect:

• EduConnect Core (Managed Package)

- **Purpose:** Core student success platform functionality
- **Package Name:** EduConnect Student Success Platform
- **Namespace:** `educonnect`
- **Version:** 3.2.1
- **Protection Level:** Managed (code obfuscated)

• Components Included:

- Core custom objects (Student__c, Course__c, Enrollment__c)
- Essential Apex classes and triggers
- Standard Lightning Web Components
- Base security model (profiles and permission sets)
- Core automation (workflows and processes)

• Benefits:

- Intellectual Property Protection: Source code is hidden
- **Versioning**:** Supports upgrade and rollback
- App Exchange Distribution: Can be listed publicly
- **Automatic Updates:** Push updates to subscribers
- **License Management:** Control usage and access

EduConnect Extensions (Unmanaged Packages)

Purpose: Institution-specific customizations and integrations

Package Name: EduConnect University Extensions

Protection Level: Unmanaged (source code visible)

• Components Included:

- University-specific validation rules
- Custom integration endpoints
- Specialized reporting components
- Custom branding elements
- Local compliance modifications

• Benefits:

- **Full Customization:** Complete access to modify components
- **No Version Dependency:** Can be modified without package constraints
- **Easier Development:** Simpler development and testing process

- **Cost Effective**: No ongoing license fees

- Package Development Process:

- Package Testing Strategy:

1. **Unit Testing**: 100% test coverage for managed package components
2. **Integration Testing**: Cross-component functionality validation
3. **Subscriber Testing**: Deploy to test subscriber orgs
4. **Performance Testing**: Load testing with realistic data volumes
5. **Security Testing**: Vulnerability assessment and penetration testing
6. **Upgrade Testing**: Ensure smooth upgrades from previous versions

How to navigate:

1. **Setup** → **Apps** → **Packaging** → **Package Manager**
2. **Create Package** → Configure package details and components
3. **Upload Package** → Create package versions for distribution
4. **Manage Licenses** → Control subscriber access (managed packages)

ANT Migration Tool

1. What it is:

Command-line utility for deploying Salesforce metadata using Apache ANT and the Metadata API.

2. ANT Deployment Configuration:

3. Build Properties Configuration

4. How to navigate:

1. **Download ANT Migration Tool** → Install Apache ANT and Salesforce adapter
2. **Configure build.xml** → Set up deployment targets and credentials
3. **Execute Commands** → Run `ant deployCode` from command line
4. **Monitor Logs** → Review deployment results and error messages

VS Code & SFDX

1. What it is:

Modern development environment using Visual Studio Code with Salesforce Extensions and Salesforce CLI (SFDX).

2. Development Environment Setup:

3. VS Code Extensions Installed:

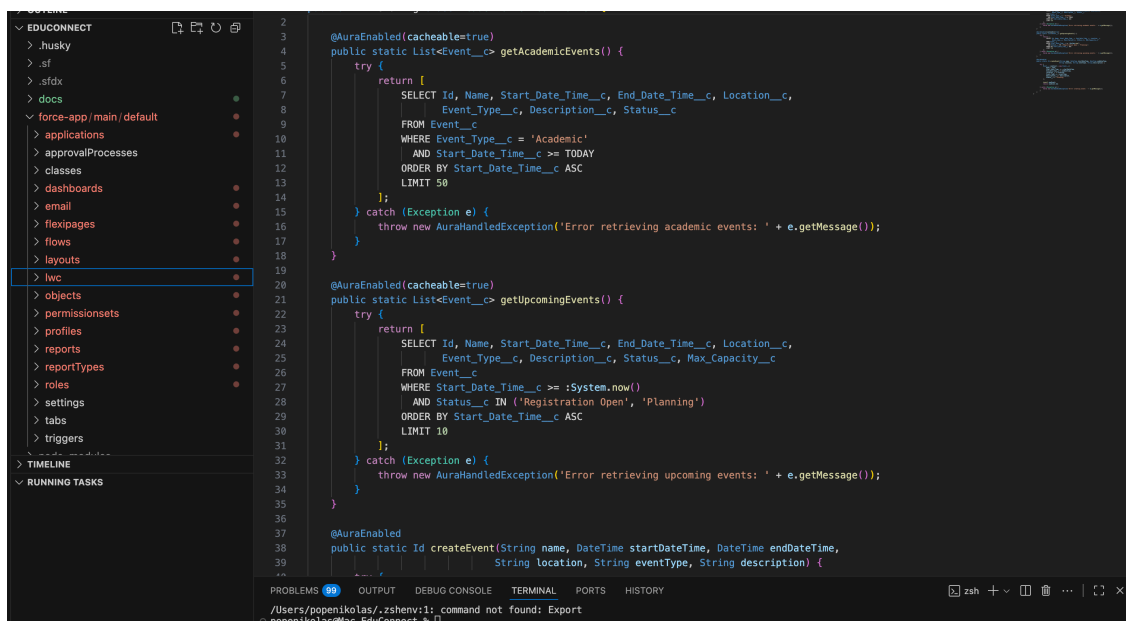
- **Salesforce Extension Pack**: Core Salesforce development tools
- Salesforce CLI Integration: *Command palette integration*
- **Apex PMD**: Code quality analysis

- Prettier - Code Formatter^{**}: Consistent code formatting
- **GitLens**: Enhanced Git integration
- **Thunder Client**: API testing within VS Code

SFDX Project Structure:

```

EduConnect/
├── .sfdx/                  # SFDX configuration
├── .vscode/                # VS Code settings
│   ├── extensions.json
│   ├── launch.json
│   └── settings.json
├── config/                 # Scratch org definitions
│   └── project-scratch-def.json
├── force-app/
│   ├── main/
│   │   └── default/
│   │       ├── classes/    # Apex classes
│   │       ├── triggers/   # Apex triggers
│   │       ├── lwc/        # Lightning Web Components
│   │       ├── objects/    # Custom objects
│   │       ├── tabs/       # Custom tabs
│   │       └── permissionsets/ # Permission sets
│   └── scripts/            # Deployment scripts
│       ├── apex/          # Anonymous Apex scripts
│       └── shell/          # Shell scripts
├── tests/                  # Test data and utilities
├── package.json            # Node.js dependencies
├── sfdx-project.json       # SFDX project configuration
└── README.md              # Project documentation
  
```



Key Benefits Achieved

1. **Data Integrity**: Comprehensive duplicate prevention and validation
2. **Scalable Deployment**: Automated CI/CD pipeline for reliable releases
3. **Data Protection**: Robust backup and recovery procedures
4. **Modern Development**: Industry-standard development tools and practices
5. **Version Control**: Complete change tracking and rollback capabilities
6. **Quality Assurance**: Automated testing and validation throughout pipeline
7. **Operational Efficiency**: Automated data management and deployment processes

Maintenance and Operations

1. **Monitoring**: Automated alerts for data quality issues and deployment failures
2. **Performance**: Regular database optimization and index maintenance
3. **Security**: Ongoing security reviews and access audits
4. **Documentation**: Comprehensive deployment and operational procedures
5. **Training**: Staff training on tools and processes
6. **Disaster Recovery**: Regular testing of backup and recovery procedures
7. **Compliance**: Audit trails and regulatory compliance reporting