# Phase 8: Data Management & Deployment

## AI-Enabled Hospital & Pharmacy Management System

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**Goal**: The goal of Phase 8 was to explore and implement Salesforce's tools and techniques for managing data and deploying metadata between environments. This included importing, exporting, and updating records, preventing duplicates, scheduling backups, and deploying customizations using Change Sets, Packages, ANT, and SFDX. Together, these steps ensure data integrity, controlled deployments, and modern DevOps readiness for the CareTrack project.

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**Tasks in Phase 8:**

- Data Import Wizard
- Data Loader
- Duplicate Rules
- Data Export & Backup
- Change Sets
- Unmanaged vs Managed Packages
- ANT Migration Tool
- VS Code & SFDX

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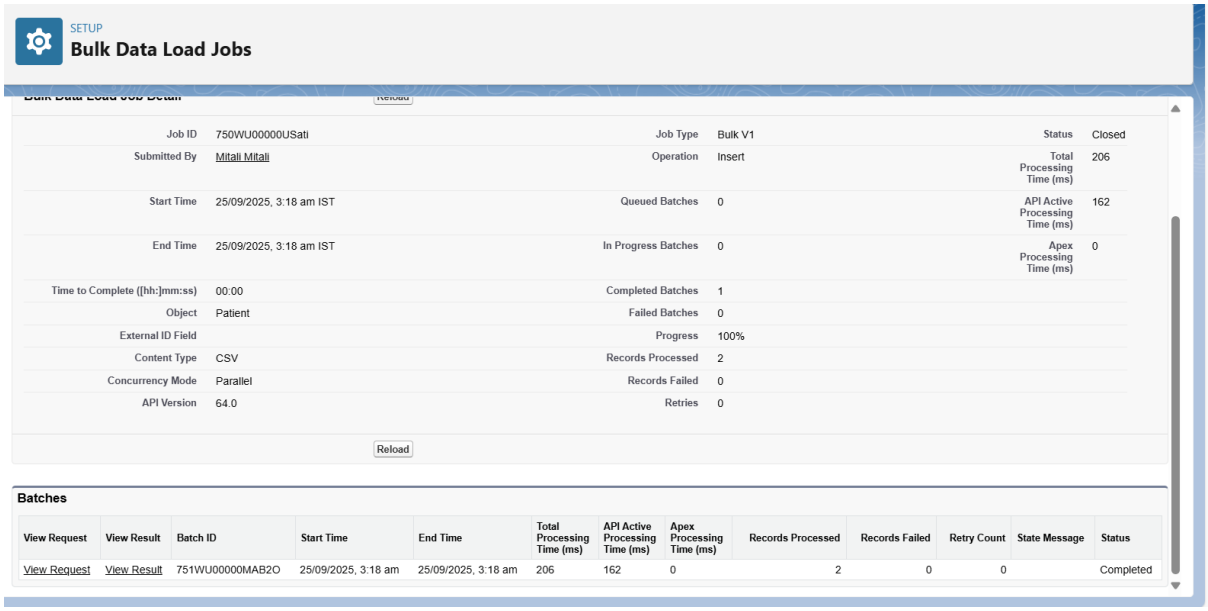
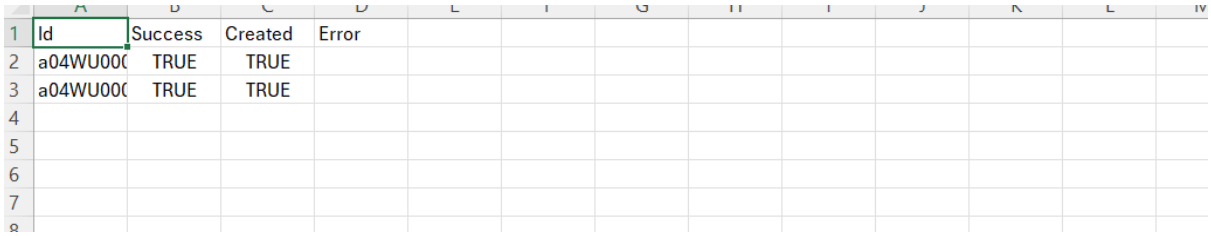
**Data Import Wizard**

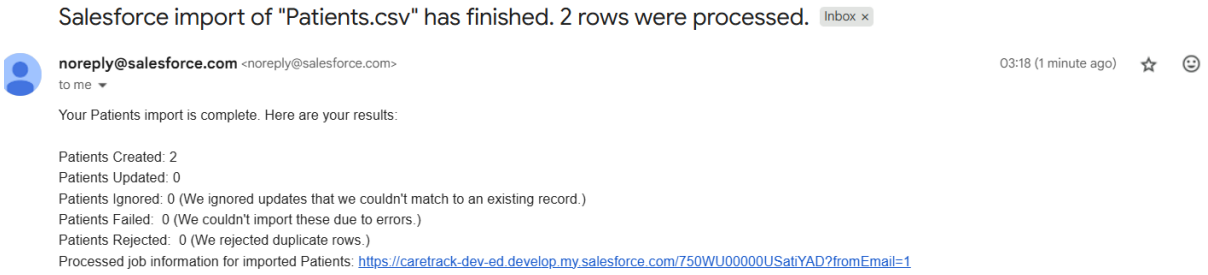
1. Setup → Quick Find → Data Import Wizard → Launch.
2. Select object (e.g., Patient__c) under Custom Objects.
3. Choose action: Insert / Update / Upsert.
4. Upload CSV → Map fields (Name → Name, Age__c → Age__c, etc.).
5. Start Import → View Import Status.

Conclusion: Data Import Wizard allowed me to quickly insert and update small data volumes (up to 50k records) without external tools, making it useful for initial Patient, Doctor, and Appointment data loads.



| | A | B | C | D |
|---|---|---|---|---|
| 1 | Id | Success | Created | Error |
| 2 | a04WU000 | TRUE | TRUE | |
| 3 | a04WU000 | TRUE | TRUE | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |

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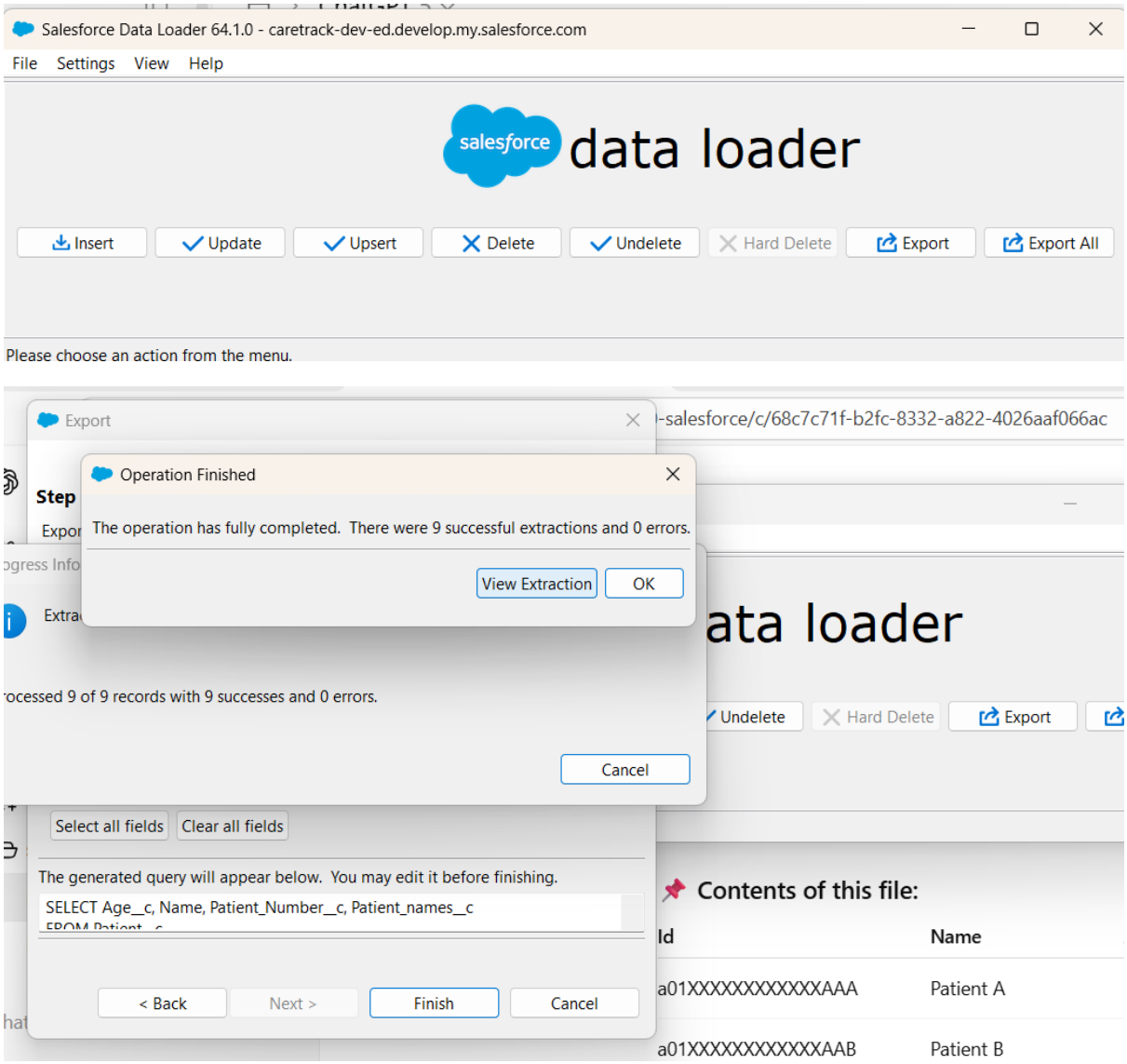
## Data Loader

1. Download & run Data Loader (dataloader-64.0.1.jar).
2. Login with Username + Password + Security Token.
3. Choose Insert / Update / Export.
4. Select object (e.g., Patient__c).
5. Upload CSV → Map fields.
6. Execute → review success.csv & error.csv.

Conclusion: Data Loader enabled bulk operations (insert, update, export) on Patients and Appointments, which was useful for mass updates and creating backup CSVs.


Salesforce Data Loader 64.1.0 - caretrack-dev-ed.develop.my.salesforce.com
File Settings View Help
salesforce data loader
Insert Update Upsert Delete Undelete Hard Delete Export Export All
Please choose an action from the menu.
Export
Operation Finished
The operation has fully completed. There were 9 successful extractions and 0 errors.
View Extraction OK
Cancel
Select all fields Clear all fields
The generated query will appear below. You may edit it before finishing.
SELECT Age__c, Name, Patient_Number__c, Patient_names__c
< Back Next > Finish Cancel
Contents of this file:
Id Name
a01XXXXXXXXXXXAAA Patient A
a01XXXXXXXXXXXAAB Patient B

CSV Viewer

| Row Number | Age__c | Name | Patient_Number__c | Patient_names__c |
|---|---|---|---|---|
| 1 | 23.0 | PAT-0001 | PAT-0001 | Test Patient 1 |
| 2 | 54.0 | PAT-0002 | PAT-0002 | abc |
| 3 | 32.0 | PAT-0003 | PAT-0003 | John Doe |
| 4 | 40.0 | PAT-0004 | PAT-0004 | Jane Smith |
| 5 | 30.0 | PAT-0005 | PAT-0005 | Patient A |
| 6 | 25.0 | PAT-0006 | PAT-0006 | Patient B |
| 7 | 40.0 | PAT-0007 | PAT-0007 | Patient C |
| 8 | 35.0 | PAT-0008 | PAT-0008 | Patient D |
| 9 | 28.0 | PAT-0009 | PAT-0009 | Patient E |

To open the CSV in the associated external program such as Microsoft Excel, click the bu

Open in external program

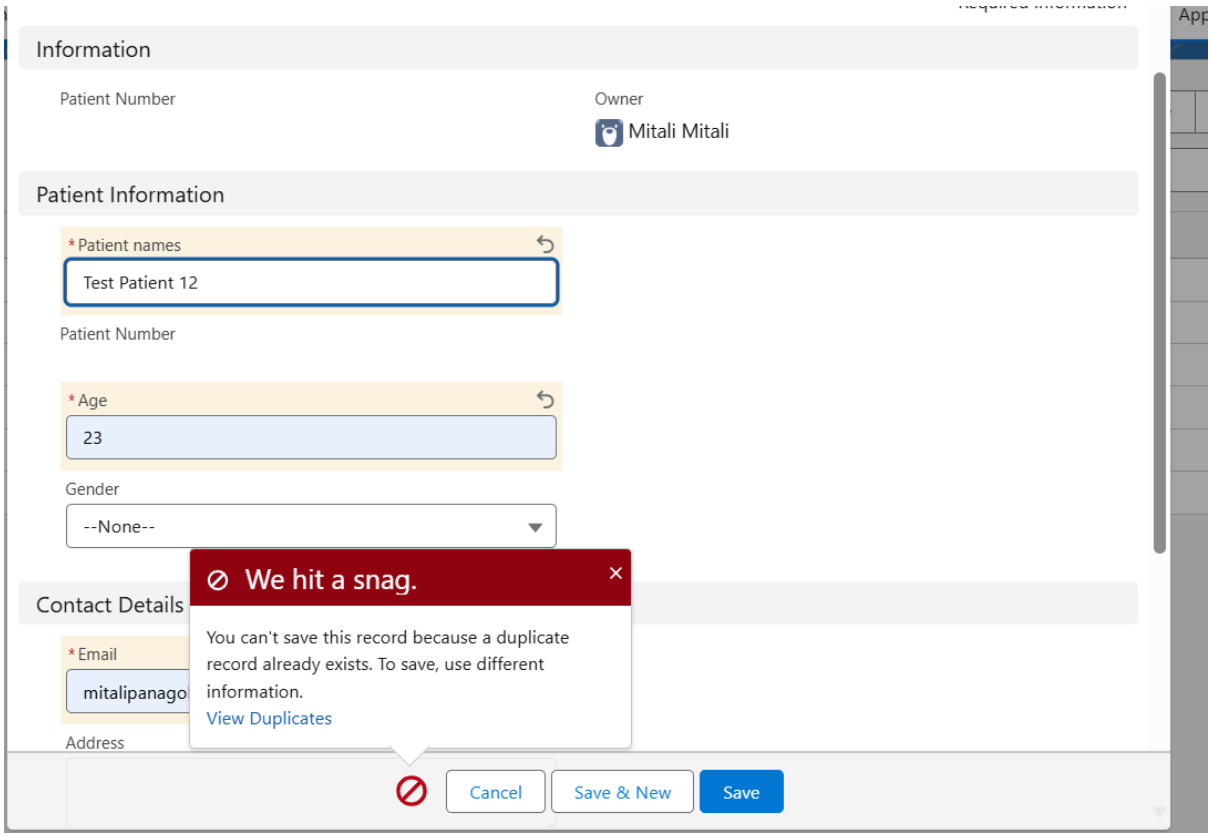
**Inserted**

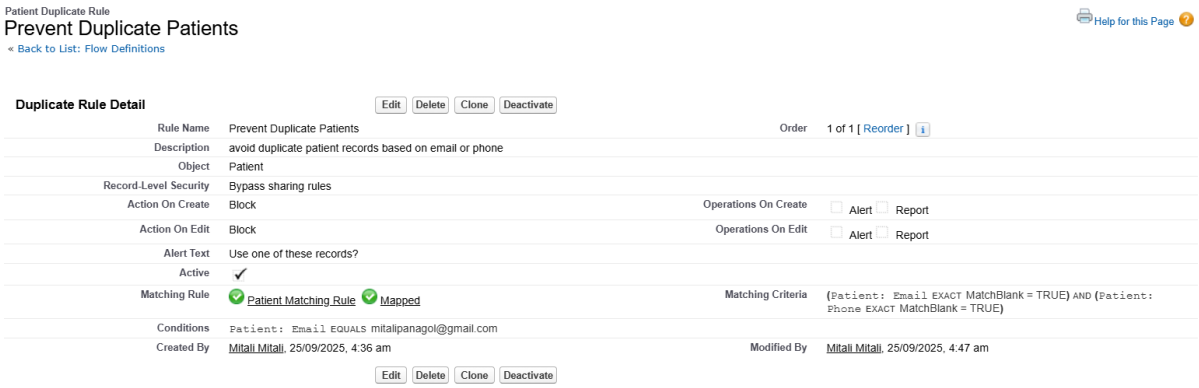
| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | ID | Patient_na | Age__c | Disease__c | Phone__c | STATUS | | |
| 2 | a04WU00( | Patient A | 30 | Cold | 9.88E+09 | Item Created | | |
| 3 | a04WU00( | Patient B | 25 | Fever | 9.12E+09 | Item Created | | |
| 4 | a04WU00( | Patient C | 40 | Diabetes | 9.99E+09 | Item Created | | |
| 5 | a04WU00( | Patient D | 35 | Asthma | 9.01E+09 | Item Created | | |
| 6 | a04WU00( | Patient E | 28 | Flu | 9.35E+09 | Item Created | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |

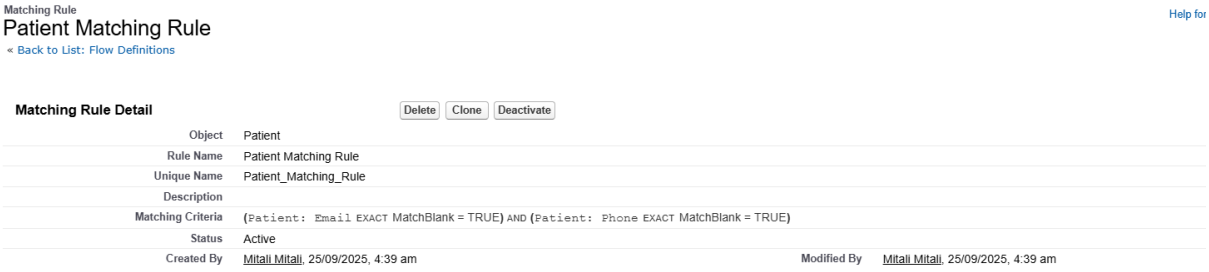
## Duplicate Rules

1. Setup → Quick Find → Matching Rules → Create New (e.g., Patient Email/Phone).
2. Activate Matching Rule.
3. Setup → Duplicate Rules → Create New Rule → attach Matching Rule.
4. Set actions: Block on create/edit or Allow but Alert.
5. Activate → test by creating a duplicate Patient.

Conclusion: Duplicate Rules ensured that Patients cannot be created with the same email/phone, improving data integrity in CareTrack.



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## Data Export & Backup

- Setup → Quick Find → Data Export.
- Choose Export Now (one-time) or Schedule Export (weekly/monthly).
- Select objects (Patients, Doctors, Appointments, etc.).
- Start Export → download ZIP file with CSV backups.

Conclusion: Data Export Wizard provided a simple backup mechanism, ensuring project data can be restored or migrated if needed.

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## Change Sets

Since this project is implemented in a Developer Edition org, Change Sets are not available. For deployment, I used Unmanaged Packages and SFDX instead, which achieve the same outcome of migrating customizations.

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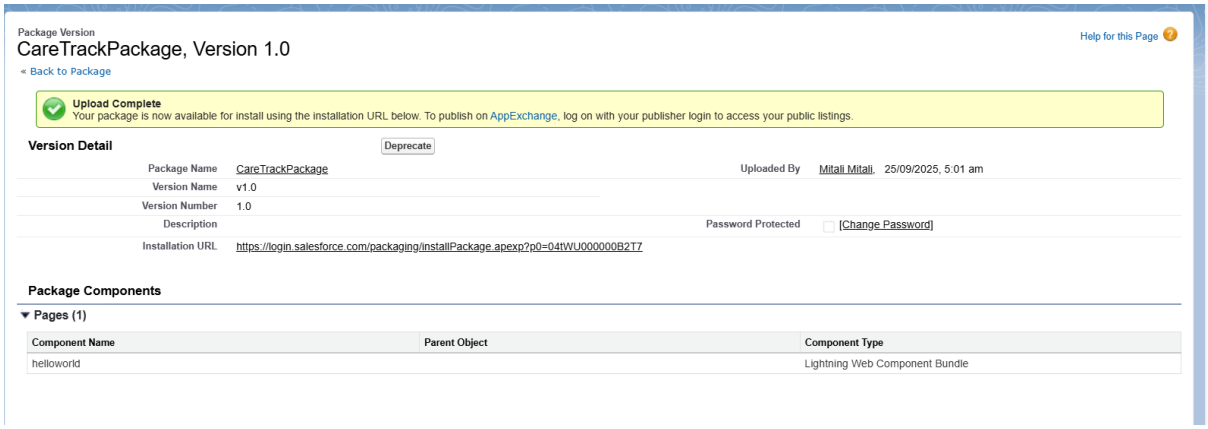
## Unmanaged vs Managed Packages

## Unmanaged=




Link=https://login.salesforce.com/packaging/installPackage.apexp?p0=04tWU000000B2T7&isdtp=p1

- Goal: To bundle my project's custom objects, Apex classes, and Lightning components into a single deployable package for easy migration.
- Implementation: I created an Unmanaged Package named CareTrackPackage, added all project components (custom objects like Patients, Doctors, Appointments, Pharmacy Inventory, etc.), and uploaded it.
- Conclusion: The package can now be installed in any Salesforce org using the generated install link. This makes it easy to share my project while keeping all metadata editable.

In this project, I created an **Unmanaged Package** to bundle and deploy my custom objects, Apex classes, and Lightning components. Managed Packages are generally used by Salesforce ISVs for publishing apps on AppExchange, but since this is a Developer Org project, only Unmanaged Packages are supported. Unmanaged Packages are best for internal sharing and migration of customizations, while Managed Packages provide versioning and locked components for enterprise distribution

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## ANT Migration Tool and VS Code & SFDX

Goal: To demonstrate how ANT Migration Tool can be used to automate deployment of metadata between Salesforce orgs.

Implementation: Installed Apache ANT, configured build.properties, build.xml, and package.xml files, and used commands ant retrieve and ant deploy to move metadata.

Conclusion: ANT Migration Tool provides a scriptable way of managing deployments, useful for CI/CD pipelines, though in modern projects, SFDX/VS Code is preferred.

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## Conclusion

Phase 8 successfully demonstrated how Salesforce supports robust data management and deployment. I used Data Import Wizard and Data Loader for handling records, Duplicate Rules for data integrity, Data Export Wizard for backup, and Packages/VS Code SFDX for metadata deployment. Together, these tools ensured that the CareTrack project is not only functional but also scalable, secure, and deployment-ready for real-world use cases.

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