Phase 8: Data Management & Security Report

8.1 Data Import Strategy

8.1.1 Patient Data Migration

Preparation Steps

1. Clean Source Data
   - Standardize phone number formats
   - Validate email addresses
   - Remove duplicates
   - Ensure required fields are populated
2. Create Import Templates

Template (Patient_Data.csv):

```
First_Name,Last_Name,Email,Phone,Birthdate,Street,City,State,Postal_Code,Record_Type
John,Doe,john.doe@email.com,+1-555-123-4567,1985-03-15,123 Main St,Anytown,CA,12345,Active Patient
```

Import Process (via Data Import Wizard):

- Navigation: `Setup → Data Import Wizard → Launch Wizard`
- Object: **Contact**
- Operation: **Insert new records**
- File: **Patient_Data.csv**
- Field Mapping:
  - First Name → FirstName
  - Last Name → LastName
  - Email → Email
  - Phone → Phone
  - Birth Date → Birthdate

8.1.2 Doctor Data Import

Doctor Import Template (Doctor_Data.csv):

```
Doctor_Name,Specialization,License_Number,Email,Phone,Consultation_Fee,Available_Days,Start_Time,End_Time,Status
```

```
Dr. John Smith,Cardiology,LIC123456,dr.smith@clinic.com,555-
0001,500,"Monday;Tuesday;Wednesday;Thursday;Friday",09:00,17:00,Active
```

Import via **Data Import Wizard** or **Data Loader** (for bulk data).

8.1.3 Historical Appointment Data

Tool: Data Loader (bulk upload)

Steps:

1. Open Data Loader → Select **Insert**
2. Object: `Appointment__c`
3. Choose **Appointment_History.csv**
4. Map fields manually or with saved mapping

CSV Fields Required:

- Patient__c (Contact ID)
- Doctor__c (Doctor ID)
- Appointment_Date__c
- Appointment_Time__c
- Status__c
- Appointment_Type__c

8.2 Data Quality Management

8.2.1 Duplicate Rules

Patient Duplicate Rule

- Setup: `Duplicate Management → Duplicate Rules → New Rule`
- Object: **Contact**
- Rule Name: *Patient Duplicate Rule*
- Record Level Security: Enforce Sharing Rules
- Matching Rule: *Standard Contact Matching Rule*
- Actions:
    - Allow: Yes (with alert)
    - Report: Yes
    - Alert Text: *"Potential duplicate patient found. Please review before saving."*

Doctor Duplicate Rule

- Object: **Doctor__c**
- Rule Name: *Doctor License Duplicate Rule*
- Matching Criteria: License Number (Exact Match)
- Action: **Block duplicates**

8.2.2 Data Validation

Phone Number Validation (Contact)

```
AND(
  NOT(ISBLANK(Phone)),
  NOT(REGEX(Phone, "\\+?1?[\\s-]?\\(?[0-9]{3}\\)?[\\s-]?[0-9]{3}[\\s-]?[0-
9]{4}"))
)
```

Error Message: *"Please enter a valid phone number format (e.g., +1-555-123-4567)"*

Professional Email Validation

```
AND(
  NOT(ISBLANK(Email)),
  OR(
    CONTAINS(Email, "@gmail."),
    CONTAINS(Email, "@yahoo."),
    CONTAINS(Email, "@hotmail.")
  ),
  RecordType.DeveloperName = "Active_Patient"
)
```

Error Message: *"Professional or clinic email required for active patients"*

8.3 Backup and Recovery Strategy

8.3.1 Weekly Data Export

- Setup → Data Export → Schedule Export
- Frequency: **Weekly**
- Format: **CSV**
- Objects:
  - Contact (Patients)
  - Doctor__c
  - Appointment__c
  - Medical_Case__c
  - Bill_Information__c

```
public class DataBackupScheduler implements Schedulable {
    public void execute(SchedulableContext sc) {
        Database.executeBatch(new DataBackupBatch(), 200);
    }
}

public class DataBackupBatch implements Database.Batchable<SObject> {
    public Database.QueryLocator start(Database.BatchableContext bc) {
        return Database.getQueryLocator([
            SELECT Id, Name, Email, Phone, CreatedDate, LastModifiedDate
            FROM Contact
            WHERE CreatedDate = LAST_N_DAYS:7 OR LastModifiedDate =
LAST_N_DAYS:7
        ]);
    }
    public void execute(Database.BatchableContext bc, List<Contact> records)
{
        // Backup logic (cloud storage/external system integration)
    }
    public void finish(Database.BatchableContext bc) {
        // Send backup completion notification
    }
}
```

8.4 Advanced Security Configuration

8.4.1 Field-Level Security

Example (Medical_Case__c fields):

- **Diagnosis__c:** Manager & Doctor → Read/Write, Staff → Read Only
- **Treatment_Plan__c:** Manager & Doctor → Read/Write, Staff → No Access
- **Prescription__c:** Manager & Doctor → Read/Write, Staff → No Access

8.4.2 IP Range Restrictions

- Clinical Manager Profile: Restrict to Clinic IP Range (e.g., 192.168.1.0 – 192.168.1.255)
- Doctor Profile: Wider range allowed (0.0.0.0 – 255.255.255.255) with MFA

8.4.3 Audit Trail & Field History Tracking

- **Audit Trail:** Track user login/logout, data exports, permission/profile changes
- **Field History Tracking:**
    - Contact: Email, Phone, Status changes

- Appointment: Status, Date, Doctor changes
- Medical Case: Diagnosis, Treatment_Plan changes
- Bill Information: Amount, Payment_Status changes