

Phase 3: Data Modeling & Relationships

1. Introduction

Phase 3 focuses on designing a **student-centric data model** in Salesforce to manage academic, attendance, extracurricular, and career information in a structured and integrated manner. The purpose of this phase is to create a system where all student-related data is linked to a central object, enabling accurate reporting, efficient data management, and scalability for future enhancements.

Salesforce's **Schema Builder** is used to visualize relationships between objects, ensuring clarity, correctness, and maintainability of the data model.

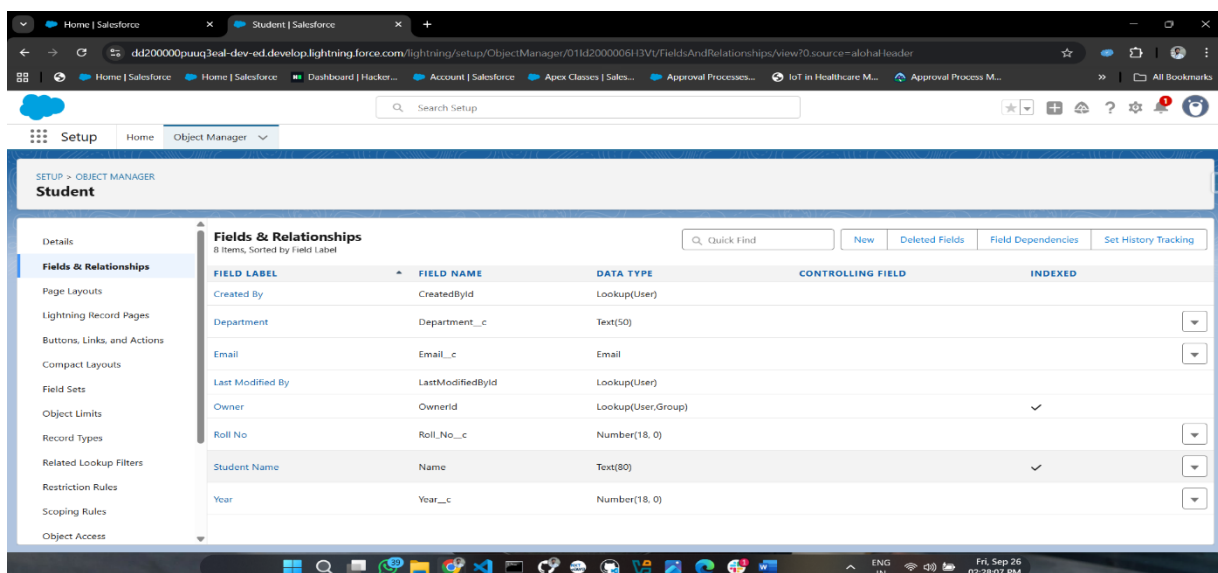
2. Objectives

- To create **custom objects** representing students and their related data.
- To define appropriate **fields and data types** for each object.
- To establish **Master-Detail and Lookup relationships** for data integrity and logical linkage.
- To visualize the entire model using **Schema Builder** for clarity and verification.
- To prepare the foundation for **reports, dashboards, and automation**.

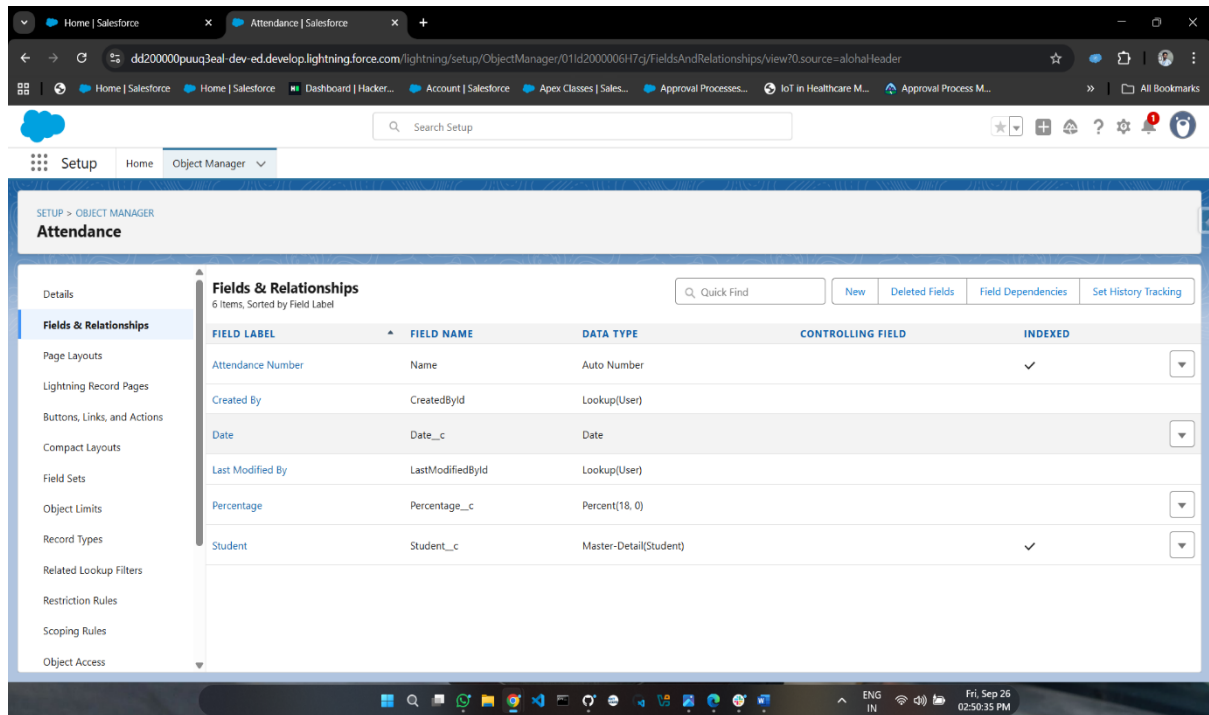
3. Custom Objects

The data model comprises five primary objects:

1. **Student__c** – Core object storing student information such as name, roll number, department, year, and email.



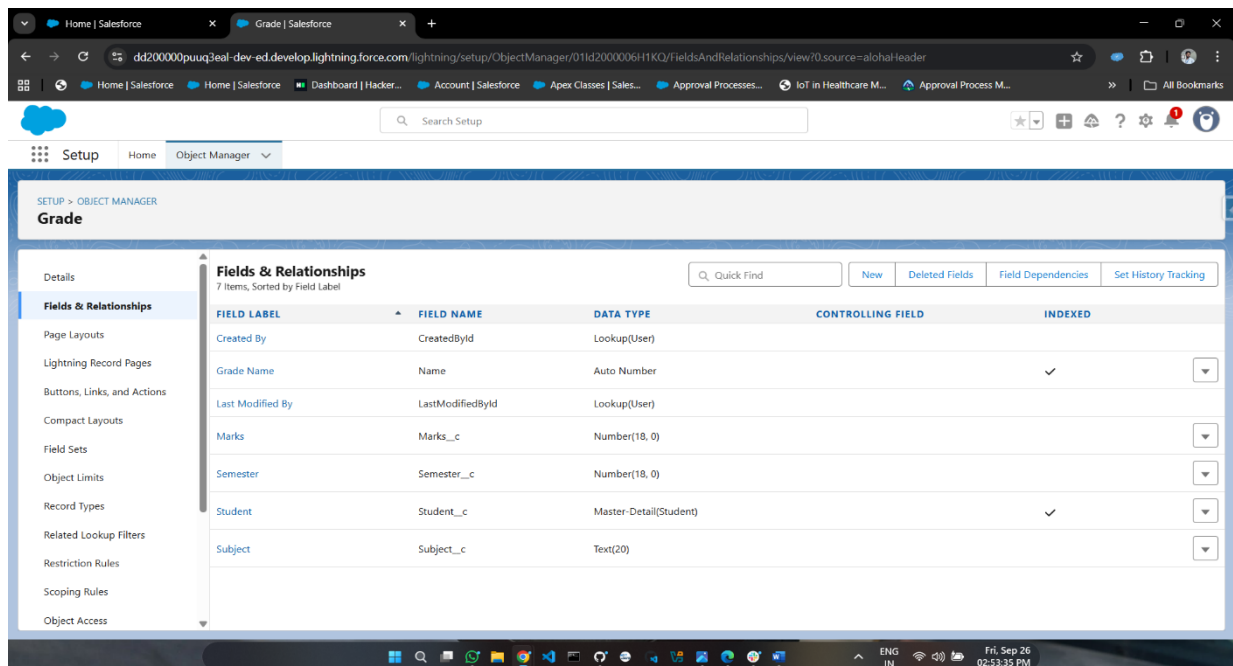
2. Attendance__c – Tracks student attendance with fields like date and percentage of classes attended.



The screenshot shows the Salesforce Setup interface for the 'Attendance' object. The 'Fields & Relationships' tab is selected, displaying a table of 6 fields. The table has columns for FIELD LABEL, FIELD NAME, DATA TYPE, CONTROLLING FIELD, and INDEXED. The fields listed are: Attendance Number (Name, Auto Number, Indexed), Created By (CreatedBy, Lookup(User)), Date (Date__c, Date, Indexed), Last Modified By (LastModifiedBy, Lookup(User)), Percentage (Percentage__c, Percent(18, 0), Indexed), and Student (Student__c, Master-Detail(Student), Indexed).

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Attendance Number	Name	Auto Number		✓
Created By	CreatedBy	Lookup(User)		
Date	Date__c	Date		✓
Last Modified By	LastModifiedBy	Lookup(User)		
Percentage	Percentage__c	Percent(18, 0)		✓
Student	Student__c	Master-Detail(Student)		✓

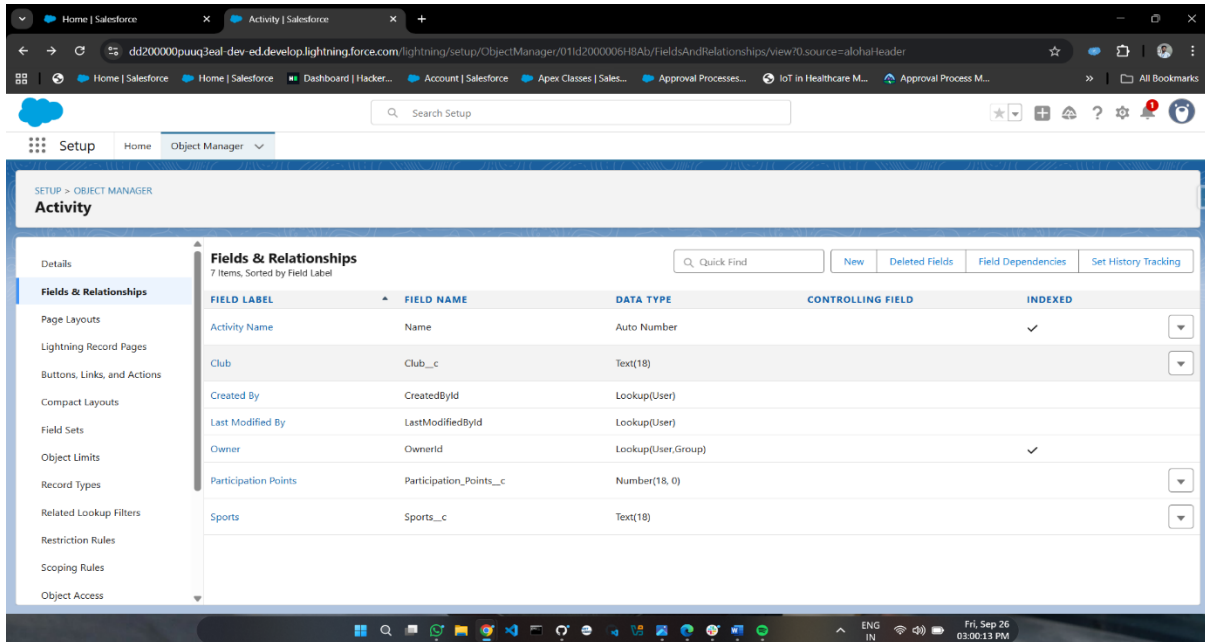
3. Grade__c – Stores academic performance details, including subject, semester, and marks obtained.



The screenshot shows the Salesforce Setup interface for the 'Grade' object. The 'Fields & Relationships' tab is selected, displaying a table of 7 fields. The table has columns for FIELD LABEL, FIELD NAME, DATA TYPE, CONTROLLING FIELD, and INDEXED. The fields listed are: Created By (CreatedBy, Lookup(User)), Grade Name (Name, Auto Number, Indexed), Last Modified By (LastModifiedBy, Lookup(User)), Marks (Marks__c, Number(18, 0), Indexed), Semester (Semester__c, Number(18, 0), Indexed), Student (Student__c, Master-Detail(Student), Indexed), and Subject (Subject__c, Text(20), Indexed).

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Created By	CreatedBy	Lookup(User)		
Grade Name	Name	Auto Number		✓
Last Modified By	LastModifiedBy	Lookup(User)		
Marks	Marks__c	Number(18, 0)		✓
Semester	Semester__c	Number(18, 0)		✓
Student	Student__c	Master-Detail(Student)		✓
Subject	Subject__c	Text(20)		✓

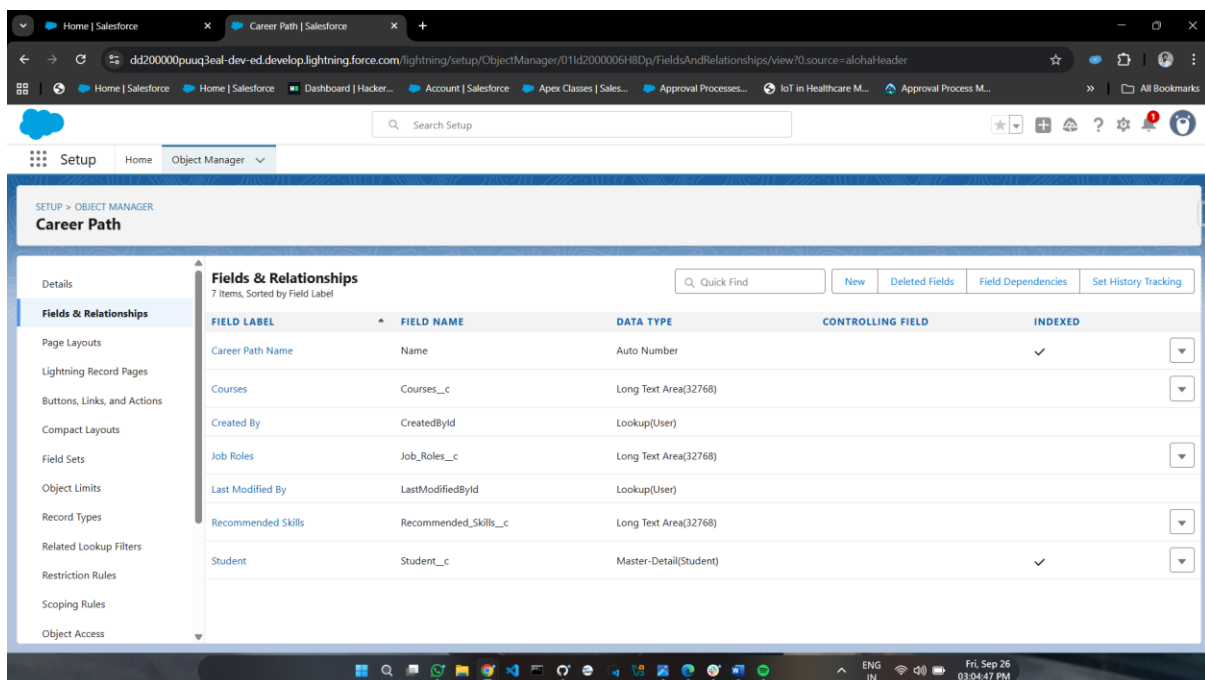
4. **Activity__c** – Records extracurricular participation, including clubs, sports, and participation points.



The screenshot shows the Salesforce Setup interface for the 'Activity' object. The 'Fields & Relationships' section is active, displaying a table of fields. The table has columns for Field Label, Field Name, Data Type, Controlling Field, and Indexed. The fields listed are: Activity Name (Name, Auto Number, Indexed), Club (Club__c, Text(18)), Created By (CreatedById, Lookup(User)), Last Modified By (LastModifiedById, Lookup(User)), Owner (OwnerId, Lookup(User, Group), Indexed), Participation Points (Participation_Points__c, Number(18, 0)), and Sports (Sports__c, Text(18)).

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Activity Name	Name	Auto Number		✓
Club	Club__c	Text(18)		
Created By	CreatedById	Lookup(User)		
Last Modified By	LastModifiedById	Lookup(User)		
Owner	OwnerId	Lookup(User, Group)		✓
Participation Points	Participation_Points__c	Number(18, 0)		
Sports	Sports__c	Text(18)		

5. **Career_Path__c** – Captures career guidance data, including recommended skills, courses, and job roles.



The screenshot shows the Salesforce Setup interface for the 'Career Path' object. The 'Fields & Relationships' section is active, displaying a table of fields. The table has columns for Field Label, Field Name, Data Type, Controlling Field, and Indexed. The fields listed are: Career Path Name (Name, Auto Number, Indexed), Courses (Courses__c, Long Text Area(32768)), Created By (CreatedById, Lookup(User)), Job Roles (Job_Roles__c, Long Text Area(32768)), Last Modified By (LastModifiedById, Lookup(User)), Recommended Skills (Recommended_Skills__c, Long Text Area(32768)), and Student (Student__c, Master-Detail(Student), Indexed).

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Career Path Name	Name	Auto Number		✓
Courses	Courses__c	Long Text Area(32768)		
Created By	CreatedById	Lookup(User)		
Job Roles	Job_Roles__c	Long Text Area(32768)		
Last Modified By	LastModifiedById	Lookup(User)		
Recommended Skills	Recommended_Skills__c	Long Text Area(32768)		
Student	Student__c	Master-Detail(Student)		✓

Each object is designed to represent a distinct aspect of student data, with fields chosen to reflect relevant attributes for reporting and analysis.

4. Relationships Between Objects

4.1 Master-Detail Relationships

- Student → Attendance
- Student → Grade

Significance:

- Enforces **dependency**, ensuring child records (Attendance and Grade) cannot exist without a student.
- Enables **cascading deletion**, maintaining data integrity.
- Supports **Roll-Up Summary Fields**, such as total attendance and average marks per

FIELD LABEL	FIELD NAME	DATA TYPE
Attendance Number	Name	Auto Number
Created By	CreatedById	Lookup(User)
Date	Date_c	Date
Last Modified By	LastModifiedById	Lookup(User)
Percentage	Percentage_c	Percent(18, 0)
Student	Student_c	Master-Detail(Student)

student.

FIELD LABEL	FIELD NAME	DATA TYPE
Created By	CreatedById	Lookup(User)
Grade Name	Name	Auto Number
Last Modified By	LastModifiedById	Lookup(User)
Marks	Marks_c	Number(18, 0)
Semester	Semester_c	Number(18, 0)
Student	Student_c	Master-Detail(Student)
Subject	Subject_c	Text(20)

4.2 Lookup Relationships

- Student → Activity
- Student → Career Path

Significance:

- Provides flexibility for optional relationships; a student may have multiple activities or career paths, or none.
- Deleting a parent record does not automatically delete child records.

This combination of Master-Detail and Lookup relationships creates a **robust and flexible data model**.

- **Roll-Up Summary Fields** can be used on Student__c for aggregated calculations.

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Average Marks	Average_Marks__c	Roll-Up Summary (SUM Grade)		
Created By	CreatedById	Lookup(User)		
Department	Department__c	Text(50)		
Email	Email__c	Email		
Last Modified By	LastModifiedById	Lookup(User)		
Owner	OwnerId	Lookup(User,Group)		✓
Roll No	Roll_No__c	Number(18, 0)		
Student Name	Name	Text(80)		✓
Total Attendance	Total_Attendance__c	Roll-Up Summary (SUM Attendance)		
Year	Year__c	Number(18, 0)		

These practices ensure that the model is **reliable, maintainable, and ready for reporting**.

7. Reporting and Analytical Capabilities

The student-centric model enables comprehensive reporting:

- **Academic Performance Reports:** Average marks per student, subject-wise performance.
- **Attendance Reports:** Total attendance and absentee trends.
- **Extracurricular Reports:** Club and sports participation points.
- **Career Guidance Reports:** Recommended skills, courses, and roles for each student.

The design supports **joined reports** and **dashboards**, providing a 360-degree view of each student's academic and extracurricular profile.

8. Advantages of the Data Model

1. **Centralized Data Management:** All student information is connected to one central object.
2. **Data Integrity:** Dependencies and optional relationships maintain clean data.
3. **Reporting and Analytics:** Facilitates detailed and consolidated reporting.
4. **Scalability:** New objects like Exams, Certificates, or Internships can be added without disrupting existing structures.
5. **Automation Ready:** Supports workflows, process builders, and flows for notifications, updates, and analytics.

9. Conclusion

Phase 3 establishes a **robust, student-centric data model** in Salesforce that integrates academic, attendance, extracurricular, and career information.

- **Custom Objects:** Student, Attendance, Grade, Activity, Career Path
- **Relationships:** Master-Detail for dependent data, Lookup for optional data
- **Visualization:** Schema Builder ensures clarity and correctness
- **Capabilities:** Supports reporting, dashboards, roll-ups, and automation

This structured model forms the **foundation for comprehensive academic and student management workflows** in Salesforce.