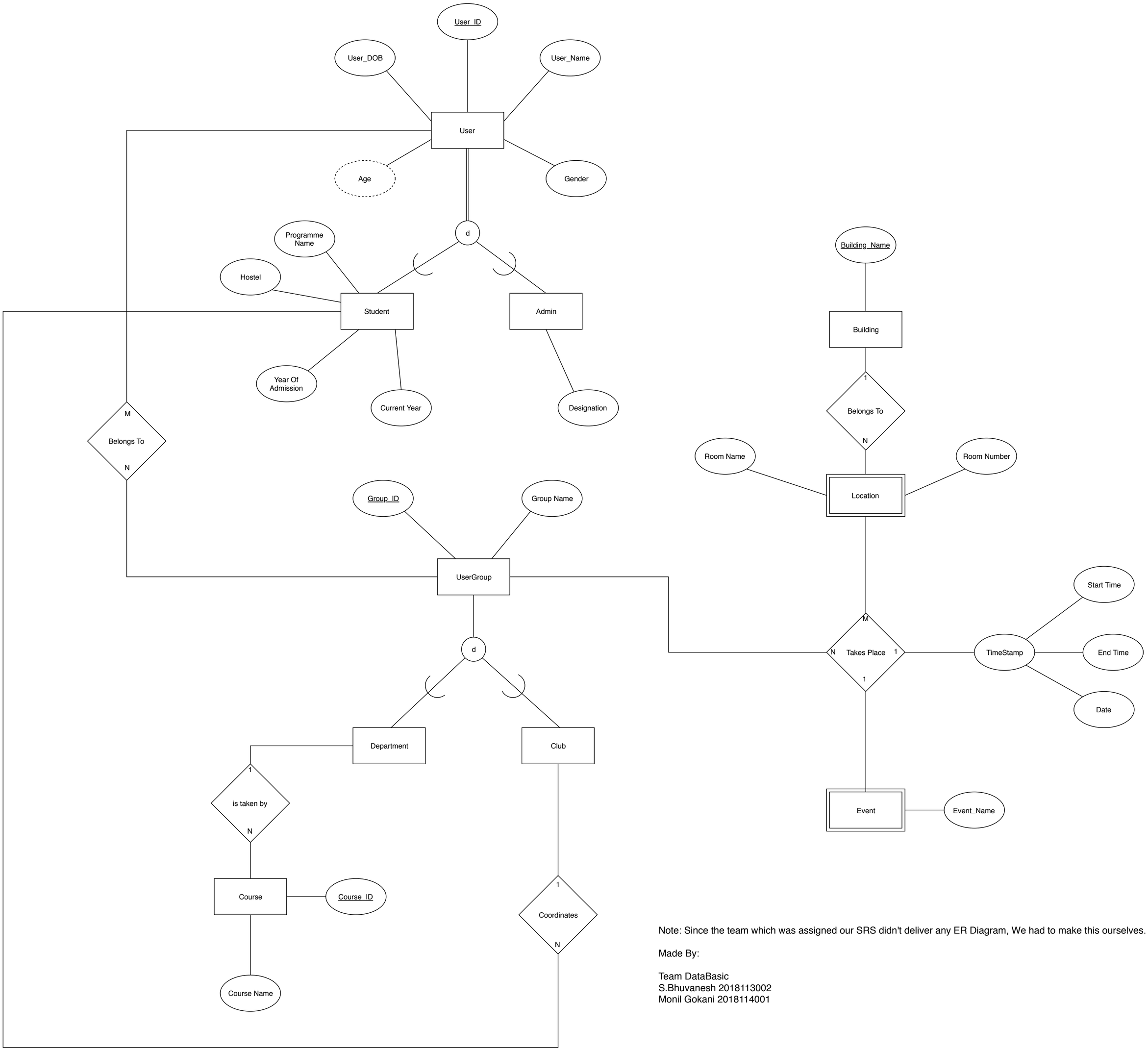
ER Diagram for Team DataBasic : Moodle Integrated Calendar System



Note: Since the team which was assigned our SRS didn't deliver any ER Diagram, We had to make this ourselves.

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Team DataBasic : Relational Model Of ER Conceptual Diagram

Moodle Integrated Calendar System

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Step Wise conversion

1. Mapping Regular Entity Types:

Student_Relation								
User_ID	User_Name	User_DOB	User_Gender	Age	Hostel_Name	YearOfAdmission	Current Year	Program_Name

UserGroup_Relation:		
Group_ID	Name	Type Attribute(Department , Club , Others)

Course_Relation:		
Course_ID	Course_Name	*Group_ID(Of Department)*

Building_Relation:	
Building_Name	NoOfRooms

Admin_Relation:					
User_ID	User_Name	User_DOB	User_Gender	Age	Designation

2. Mapping Weak Entities

Location_Relation		
Building_Name	Room_Number	Room_name

Event_Relation							
Event_Name	*Building_Name*	*Room_Number*	*Group_ID*	Group_Name	StartTime	EndTime	Date

3. Mapping Binary 1:1 Relationships

- None Exist in DB Model

4. Mapping Binary 1:N Relationships

- Course **BELONGS TO** Department:
  - Handled by adding foreign key *Group_ID* to Course relation(refer step 1)

- Co-ordinators(Users) **COORDINATE** Club
  - New Relation containing primary keys of both.

ClubCoordinator_Relation			
Group_ID	Group_Name	*User_ID*	User_Name

- Location **BELONGS TO** Building
  - Primary Key of Building added to Location relation as foreign key(Refer step 2)

5. Mapping binary M:N Relationships
    - User **BELONGS TO** User Group
    - New Relation containing Primary Keys of both Relations as Foreign Keys.

UserAndUserGroup_Relation			
User_ID	*Group_ID*	User_Name	Group_Name

6. Mapping Multi-valued attributes:
    - None Exist.

7. Mapping N-ary Relationships:
    - Event **TAKES PLACE** at Location during Timestamp for UserGroup
    - Including Primary keys of Location and User Group in Event as Foreign Keys and adding Timestamp attributes.
    - Refer Step 2

8. Mapping Generalization/Specialization:
    - Subclasses of USER : Mapped two different relations Admin and Student, who both have primary key User ID. (Refer Step 1)
    - Subclasses of User Group: Added attribute Type in UserGroup Relation to specify which type of user group it is (can be Club, Department or Other). Refer Step 1.

9. Mapping Union Types:
    - None exist.

Relational Model Obtained:

Student_Relation								
User_ID	User_Name	User_DOB	User_Gender	Age	Hostel_Name	YearOfAdmission	Current Year	Program_Name

UserGroup_Relation:		
Group_ID	Name	Type Attribute(Department , Club , Others)

Course_Relation:		
Course_ID	Course_Name	*Group_ID(Of Department)*

Building_Relation:	
Building_Name	NoOfRooms

Admin_Relation:					
User_ID	User_Name	User_DOB	User_Gender	Age	Designation

Location_Relation		
Building_Name	Room_Number	Room_name

Event_Relation							
Event_Name	*Building_Name*	*Room_Number*	*Group_ID*	Group_Name	StartTime	EndTime	Date

ClubCoordinator_Relation			
Group_ID	Group_Name	*User_ID*	User_Name

UserAndUserGroup_Relation			
User_ID	*Group_ID*	User_Name	Group_Name

Conversion to First Normal Form:

Our obtained relational model complies to the first normal form without any changes.

Conversion to Second Normal Form:

- Conversion to the second normal form is concerned with changing tables with *non-prime attributes* which are **not** *fully functional dependent* on the primary key into multiple tables.
- The tables in our relational model which don't comply with this condition are:

Event Relation:

Event_Relation						
Event_Name	*Building_Name*	*Room_Number*	*Group_ID*	StartTime	EndTime	Date

Group_Name attribute was removed, because it depended only on Group_ID part of the key of the Relation (K: <Building_Name, Room_Number, Group_ID,Start_Time,Date>)

Club Coordinator Relation:

ClubCoordinator_Relation	
Group_ID	*User_ID*

Club name and User Name was removed. (Club name depends only on Club ID and Username on User ID, hence removed as they were only parts of the key, <Club ID, User ID>)

User and UserGroup Relation

UserAndUserGroup_Relation	
User_ID	*Group_ID*

User_Name and Group_Name were removed.
Same as above.

Conversion to the Third Normal Form:

- Conversion to the Third Normal Form concerns with handling all the Transitive Dependency in our relational model.
- Age in Student_Relation and Admin_Relation and CurrentYear in Student_Relation violate the necessary condition of not having any transitive dependency.

Student_Relation						
User_ID	User_Name	User_DOB	User_Gender	Hostel_Name	YearOfAdmission	Program_Name

Admin_Relation:				
User_ID	User_Name	User_DOB	User_Gender	Designation

Age and Current Year are moved to a new relation:

UserAndAgeRelation	
User_ID	Age

StudentCurrentYearRelation	
User_ID	Current_Year

Final Relational Model:

Student_Relation						
User_ID	User_Name	User_DOB	User_Gender	Hostel_Name	YearOfAdmission	Program_Name

UserGroup_Relation:		
Group_ID	Name	Type Attribute(Department , Club , Others)

Course_Relation:		
Course_ID	Course_Name	*Group_ID(Of Department)*

Building_Relation:	
Building_Name	NoOfRooms

Location_Relation		
Building_Name	Room_Number	Room_name

Event_Relation						
Event_Name	*Building_Name*	*Room_Number*	*Group_ID*	StartTime	EndTime	Date

Admin_Relation:				
User_ID	User_Name	User_DOB	User_Gender	Designation

ClubCoordinator_Relation	
Group_ID	*User_ID*

UserAndUserGroup_Relation	
User_ID	*Group_ID*

UserAndAgeRelation	
User_ID	Age

StudentCurrentYearRelation	
User_ID	Current_Year

Example state of our Relational Model:

Student_Relation						
User_ID	**User_Name**	**User_DOB**	**User_Gender**	**Hostel_Name**	**YearOfAdmission**	**Program_Name**
21130	Ankit Roy	12-10-1998	M	Bakul	2019	CND
21140	Ankita Ray	21-10-1999	F	Parijaat	2018	ECE
Admin_Relation:						
User_ID	**User_Name**	**User_DOB**	**User_Gender**	**Designation**		
51120	Mahant Parekh	22-01-1992	M	Senior Administrator		
UserGroup_Relation:						
Group_ID	**Name**	**Type (Club. Department , Others)**				
C101	Music	Club				
O121	NLPStudents	Others				
D110	Mathematics	Department				
Building_Relation:						
Building_Name	**NoOfRooms**					
Nilgiri	10					
Himalaya	15					
Course_Relation:						
Course_ID	**Course_Name**	***Group_ID(Of***				

		Department)				
M12430	Math-I	D110				
Location_Relation						
Building_Name	**Room_Number**	**Room_name**				
Nilgiri	105	Bodh				
Himalaya	203	NULL				
UserAndUserGroup_Relation						
User_ID	***Group_ID***					
21130	O121					
21130	C101					
21140	C101					
ClubCoordinator_Relation						
Group_ID	***User_ID***					
C101	21140					
UserAndAgeRelation						
User_ID	**Age**					
21130	21					
21140	20					
51120	27					
StudentCurrentYearRelation						
User_ID	**Current_Year**					
21130	1					
21140	2					
Event_Relation						
Event_Name	***Building_Name***	***Room_Number***	***Group_ID***	**StartTime**	**EndTime**	**Date**
Guitar Workshop	Nilgiri	105	C101	13:00	16:00	21-12-2019