**Project for Database Design:**

# Phase II. Relational Schema

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| Kinjal Basu | Piyush Mahatkar |
| [kxb170730@utdallas.edu](mailto:kxb170730@utdallas.edu) | [pkm170230@utdallas.edu](mailto:pkm170230@utdallas.edu) |
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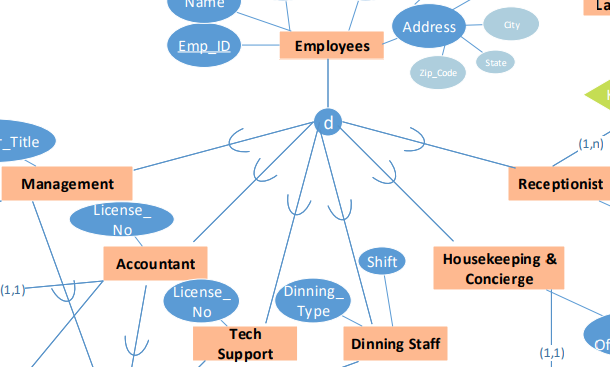
1. Modified EER diagram:
2. Mapping Relational Schemas

**2.1** **For each regular entity type in the EER Diagram,** we created a relation that includes all the simple attributes. We Included only the simple component attributes of a composite attribute. We chose one of the key attributes as the primary key.

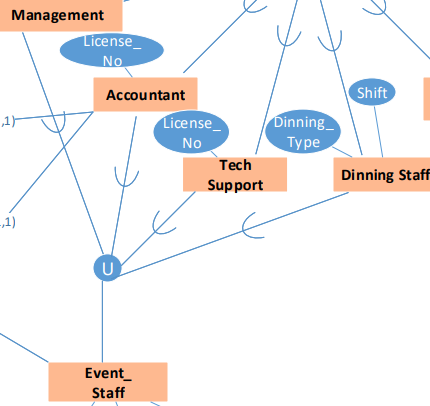
In our EER Diagram, Organization\_Event\_ Payment\_Details , Event, Organization\_Event\_ Bill\_Details, language, Hotel\_rooms, Payment, Individual\_Customer \_Bill\_Details , and Language are the Regular entities.

For Specialization we have used the strategy of using all the attributes for sub classes and super classes. Our EER Diagram has specializations and unions. Employee Entity is specialized to accountant, management, Tech support, housekeeping and conceige, Dining staff and Receptionist. Customer is specialized to Organizational client and individual customer. We have also created a Event\_staff entity as a Union for Management, Tech\_Support, Dining staff and accountant.

**Specialization:**



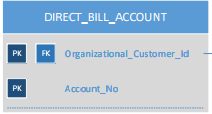
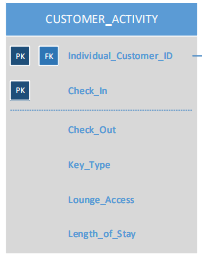
Union:



* 1. **Mapping of Weak Entity Types:**

For each weak entity type in the ER schema with owner entity type, we create a relation and include all simple attributes as attributes. In addition, include as foreign key attributes, the primary key attribute(s) of the relation that correspond to the owner entity type; this takes care of mapping the identifying relationship type. The primary key here is the combination of the primary key(s) of the owner(s) and the partial key of the weak entity type.

We have Direct\_bill\_account (foreign key with organizational\_customer\_id) and Customers\_activity (foreign key as Individual\_customer\_Id) as week entities.

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* 1. Mapping of Binary 1:1 Relationship Types

As an example, Mapping to Binary 1:1 Relationship between Housekeeping and Hotel\_Rooms.

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| Relation | Mapping Method |
|  | Since it is a one to one relationship, we use the foreign key approach. Since on Hotel\_Rooms side, the relationship is total participation, we include housekeeping\_id as a foreign key in Hotel\_Rooms |

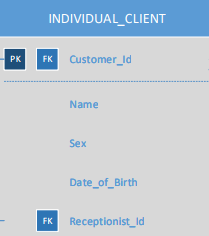
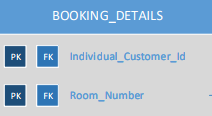
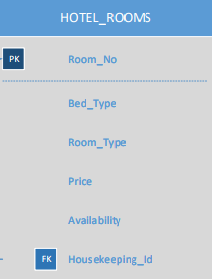
* 1. Mapping of Binary 1:N Relationship Types

Similar mapping of 1:N occurs in Accountant and Event.

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| Relation | Mapping Method |
|  | Since it is a one to many relationship, The N-side of this relationship type is Event. Thus we include the primary key Accountant\_Id of the relation Accountant as foreign key in relation Event. |

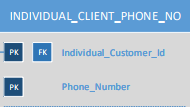
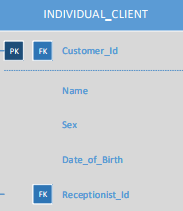
* 1. Mapping of Binary M:N Relationship Types

Here there is a M:N relationship between Individual\_Client and Hotel\_Rooms. This mapping is done using a separate relation table which has a foreign key from both the entities. Hence this new table is named as Booking\_Details.

 m  n 

* 1. Mapping of Multi-valued Attributes

We are creating a new entity for multivalued attributes, with primary key of referring relation as the foreign key in the new relation.

* 1. Mapping of N-ary Relationship Types

There are no n-ary relationships used in the design.

**2.8 Final Relational Schema.**

1. Documentation for schemas

3.1 Explanation for format design

Rules and assumptions:

* Employee\_ID is a 9-Digit Number.
* Years\_of \_experience for housekeeping\_staff is range(0-50)
* Individual\_Customer id is a 6 digit number.
* Phone number for customer is a 10 digit number of format (xxx)xxx-xxxx
* Date\_of\_Birth format is MM/DD/YYYY
* Room number is a 4 digit number.
* check-in date (‘MM/DD/YYYY’) + time (‘HH-MM-SS’)
* key type has one of the two values (card key or digital key),
* lounge access has one of the two values (Yes/No)
* organization client is uniquely identified by an ID (6-digit number)
* Every event staff member is assigned on-call number (4-digit number)
* Each event has an event ID (4-digit number).
* Each bill has a unique ID (6-digit number), with date issued format (‘MM/DD/YYYY’) and total amount in numbers.

3.2 Format for Every Relation

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| **Customer Activity:** | Data Type |
| Individual\_Customer\_ID  Check\_In  Check\_Out  Key\_Type  Lounge\_Access  Length\_of\_Stay | Integer (6 digit)  MM/DD/YYYY  MM/DD/YYYY  Boolean (Card(0)/Digital(1))  Boolean(Yes/No)  Integer |

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| **CUSTOMER:** | Data Type |
| Customer\_Id | Integer (6 digit) |

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| **ORGANIZATION\_EVENT\_PAY\_DETAILS** | Data Type |
| Payment\_Id  Payment\_Mode  Amount  Date  Time  Org\_Cust\_Id | Integer  String <chars(20)>  Integer  MM/DD/YYYY  HH:MM:SS  Integer (6 digit) |

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| **DIRECT\_BILL\_ACCOUNT** | Data Type |
| Organizational\_Customer\_Id  Account\_No | Integer (6 digit)  Integer |

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| **PAYMENT\_THROUGH\_DETAILS** | Data Type |
| Payment\_Id  Bill\_Id | Integer  Integer(6 Digit) |

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| **ORGANIZATION\_EVENT\_BILL\_DETAILs** | Data Type |
| BILL\_Id  Amount  Bill\_Date  Accountant\_ID  Event\_ID | Integer (6 digit)  Integer  MM/DD/YYYY  Integer  Integer (4 digit) |

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| **ORGANIZATIONAL\_CLIENT** | Data Type |
| Customer\_Id | Integer (6 digit) |

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| **INDIVIDUAL\_CLIENT** | Data Type |
| Customer\_Id  Name  Sex  Date\_of\_Birth  Receptionist\_Id | Integer (6 digit)  String (20 Chars)  M/F  MM/DD/YYYY  Integer |

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| **EVENT\_HOST** | Data Type |
| Event\_Id  Organizational\_Client\_Id | Integer (4 digit)  Integer (6 digit) |

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| **MANAGEMENT** | Data Type |
| Employee\_Id  Manager\_Title  Event\_Staff\_Id | Integer (9 digit)  String (20 chars)  Integer |

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| ACCOUNTANT | Data type |
| Employee\_Id  License\_No  Event\_Staff\_Id | Integer (9 digit)  Integer  Integer |

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| **TECH\_SUPPORT** | Data Type |
| Employee\_Id  License\_No  Event\_Staff\_Id | Integer (9 digit)  Integer  Integer |

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| **DINNING\_STAFF** | Data Type |
| Employee\_Id  Shift  Dining\_Type  Event\_Staff\_Id | Integer (9 digit)  string  string  Integer |

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| **HOUSEKEEPING\_CONCIERGE** | Data Type |
| Employee\_Id  Year\_of\_Experience | Integer (9 digit)  Integer (range (0-50)) |

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| **RECEPTIONIST** | Data Type |
| Employee\_Id  Year\_of\_Experience | Integer (9 digit)  Integer (range (0-50)) |

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| **EMPLOYEE** | Data Type |
| Employee\_Id  Name  Age  Salary  Street\_No  Street\_Name  City  State  Zip | Integer (9 digit)  String  Integer  Integer  Integer  String  String  String  Integer |

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| **EVENT** | Data Type |
| Event\_Id  Time  Date  Deposite  Manager\_Id  Accoutant\_Id | Integer (4 digit)  HH:MM:SS  MM/DD/YYYY  Integer  Integer  Integer |

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| **EVENT\_STAFF** | Data Type |
| Event\_Staff\_Id  On\_Call\_Number  On\_Call\_Speaker\_Number | Integer  Integer (4 digit)  Integer |

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| **EVENT\_ORGANIZED\_BY** | Data Type |
| Event\_Id  Event\_Staff\_Id | Integer (4 digit)  Integer |

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| **INDIVIDUAL\_CUSTOMER\_BILL\_DETAILS** | Data Type |
| Bill\_Id  Bill\_Amount  Customer\_Id | Integer (6 digit)  Integer  Integer (6 digit) |

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| **INDIVIDUAL\_CLIENT\_PHONE\_NO** | Data Type |
| Individual\_Customer\_Id  Phone\_Number | Integer (6 digit)  Integer (10 digit) |

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| **PAYMENT** | Data Type |
| Payment\_Id  Payment\_Date  Payment\_Time  Bill\_Id  Individual\_Customer\_Id | Integer  MM/DD/YYYY  HH:MM:SS  Integer (6 digit)  Integer (6 digit) |

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| **BOOKING\_DETAILS** | Data Type |
| Individual\_Customer\_Id  Room\_Number | Integer (6 digit)  Integer (4 digit) |

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| **INDIVIDUAL\_CLIENT\_REWARD\_MEMBER\_NO** | Data Type |
| Individual\_Customer\_Id  Member\_No | Integer (6 digit)  Integer |

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| **HOTEL\_ROOMS** | Data Type |
| Room\_No  Bed\_Type  Room\_Type  Price  Availability  Housekeeping\_Id | Integer (4 digit)  String  String  Integer  Boolean  Integer |

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| **ACCOUNTANT** | Data Type |
| Employee\_Id  License\_No  Event\_Staff\_Id | Integer (9 digit)  Integer  Integer |