

Overview

This is the report for Team 1 for Project Delivery 2

Teammates:

Course: CS 631, Section: 1J1 - Data Management System Design

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Requirements

As provided in the assignment:

Phase 2 Deliverable must contain the goal of this phase of the project, and a logical design of the database (resulting from the mapping of an EER schema to a Relational schema). Use the ER model provided as the solution of Phase 1 Deliverable to draw the Relational model in this phase. You must further describe the problems encountered in Phase 2 and justify the solutions.

Goals

For Deliverable 2 of the term project, the team started with the solution enhanced Entity Relationship (EER) diagram provided by the professor.

Steps and Approach

Leveraging the EER along with the ER-to-Relational mapping recipe provided:

ER-to-Relational mapping algorithm

- step 1: mapping of regular entity types
- step 2: napping of weak entity types
- step 3: mapping of binary 1:1 relation types
- step 4: mapping of binary 1:N relationship types

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- step 5: mapping of binary M:N relationship types
- step 6: mapping of multi-valued attributes
- step 7: mapping of N-ary relationship types mapping EER model constructs to relations
- step 8: options for mapping specialization or generalization
- step 9: mapping of union types (categories)

Implementation

Step 1 - the following all become initial entities in the logical design.

```
Customer
Review
Breview
Sreview
Rreview
Hotel
CreditCard
Reservation
```

Step 2 - the following are linked and contain keys based upon the regular entity type plus its own identifier

```
Breakfast
Service
Room
Room_res
Offerroom
```

Step 5 - Breakfast to Room Reservation M:N

- We chose to create "res_order" for connecting the two relations and using both of their keys
- Also chose to use "invoiceNumber" for the key and relation from Reservation to Room_Res and Reserves --- potentially we could have used HotelID + Rnumber + InDate -- we avoided the composite key with a date.

Step 7 - Mapping n-ary relationship -

- We have created an entity for the ternary relation "Reserves" between- Credit Card, Customer, and Reservation.

Step 8

- For Offerroom we used 8A -- which is to create a single subclass of Room
- For Review we used 8B -- which is to create 3 generalizations of review, dropping review from Step 1-

based upon the type - this was most fitting given each had their own references to distinct Weak entities - **Breakfast, Service, and Room** respectively - of which each are their own entities in the logical design from above.

Challenges and difficulties

- continued to use draw.io tool for the logical diagram: <https://github.com/jgraph/drawio>
- we chose to use "invoiceNumber" for the key and relation from Reservation to Room_Res and Reserves --- potentially we could have used HotelID + Rnumber + InDate -- we avoided the composite key with a date.

Logical Diagram

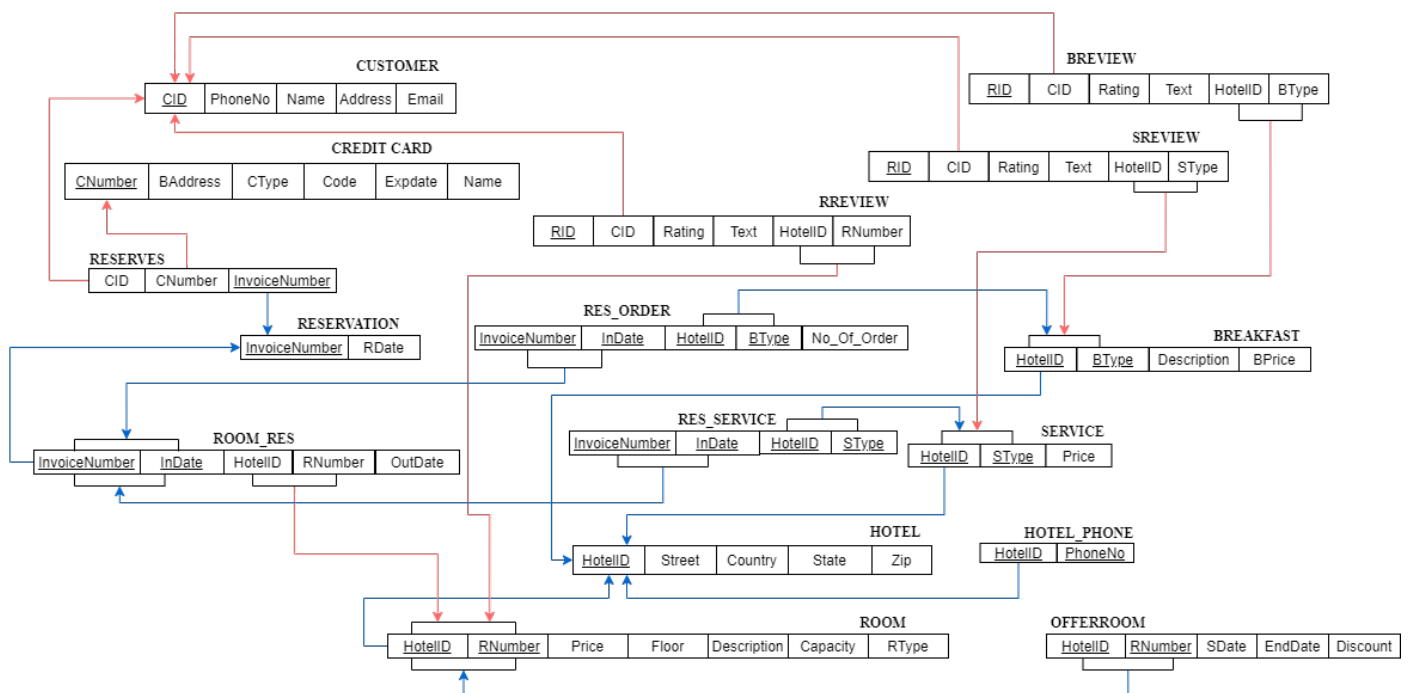


Table Listing

Team 1 - Project Deliverable 2

CUSTOMER

<u>CID</u>	PhoneNo	Name	Address	Email
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CREDIT CARD

<u>CNumber</u>	BAddress	CType	Code	Expdate	Name
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RESERVES

<u>CID</u>	CNumber	<u>InvoiceNumber</u>
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BREVIEW

<u>RIID</u>	CID	Rating	Text	HotelID	BType
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SREVIEW

<u>RIID</u>	CID	Rating	Text	HotelID	SType
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RREVIEW

<u>RIID</u>	CID	Rating	Text	HotelID	RNumber
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RESERVATION

<u>InvoiceNumber</u>	RDate
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RES_ORDER

<u>InvoiceNumber</u>	<u>InDate</u>	<u>HotelID</u>	<u>BType</u>	No_Of_Order
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BREAKFAST

<u>HotelID</u>	<u>BType</u>	Description	BPrice
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ROOM_RES

<u>InvoiceNumber</u>	<u>InDate</u>	<u>HotelID</u>	<u>RNumber</u>	OutDate
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RES_SERVICE

<u>InvoiceNumber</u>	<u>InDate</u>	<u>HotelID</u>	<u>SType</u>
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SERVICE

<u>HotelID</u>	<u>SType</u>	Price
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HOTEL

<u>HotelID</u>	Street	Country	State	Zip
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ROOM

<u>HotelID</u>	<u>RNumber</u>	Price	Floor	Description	Capacity	RType
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HOTEL_PHONE

<u>HotelID</u>	<u>PhoneNo</u>
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OFFERROOM

<u>HotelID</u>	<u>RNumber</u>	SDate	EndDate	Discount
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