Course: CS 631
Section: 002

Database Management System Design

Group 10
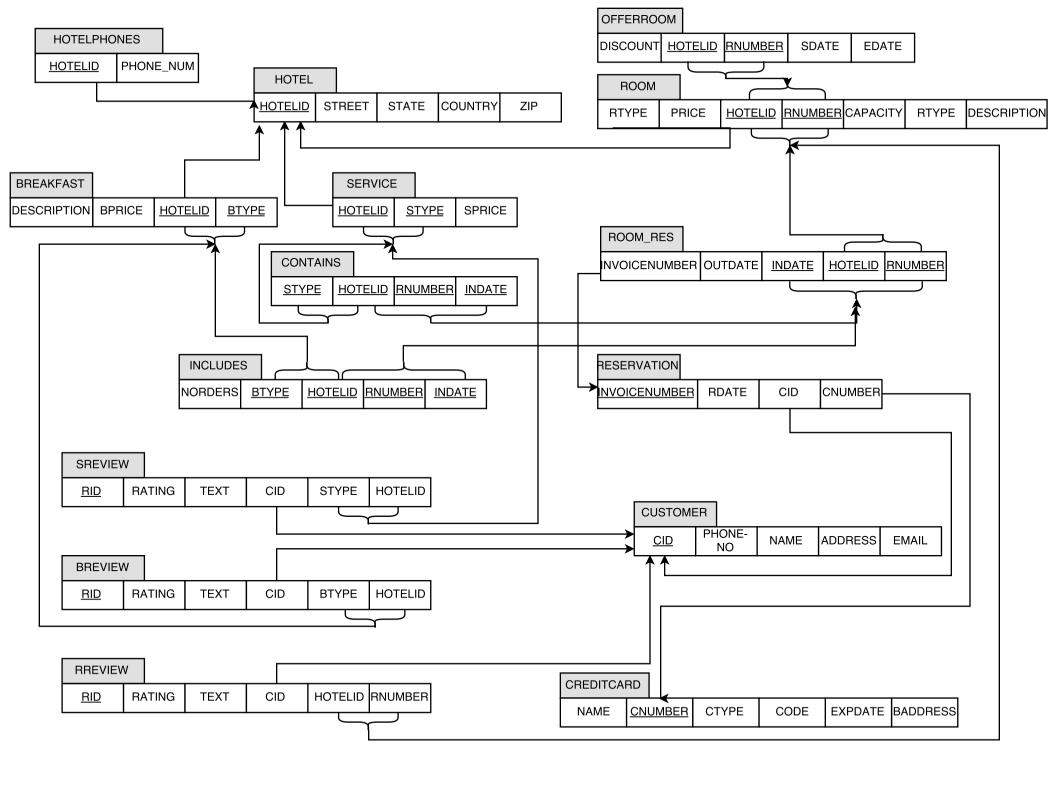**John Losito**
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Deliverable 2

1. Outline the goals for this phase and briefly mention any revisions made to the previous phase.

      The goal of this phase is translating the entity relationship model of the hotel reservation system from phase 1 of the project into a relational database. This phase of the project will give us insight about the benefits and shortcomings of the relational model compared to the entity relationship model. Translating the original model will give us more information about how attributes associated with each entity either depend on another entity's attribute and how each entity relates to each other in some way. This is something that we could not get with the entity relationship model.

      We are to use the mapping algorithm step by step in order to familiarize ourselves with the process and understand how to translate the entity relationship model into a relational model. First, we must identify strong entity types within the hotel reservation system and takes all of its atomic or simple valued attributes and create a new table with its primary key. Second, we must take all of the weak entity types with the hotel reservation system and take its partial key and combine it with the primary key of its depending entity and create its own table. A similar process must be taken for the other steps of the algorithm such as the mapping of one to one relationships, one to n relationships, and n to m relationships. This part will strengthen our ability to analyze the entity relationship model and try to map any parts that are gray and confusing, the same obstacle we faced in the first part of the project.

      Finally, this phase is to show us any mistakes that we made within the first part of the project which was to create the entity relationship model based on the specification description page. Allowing us to have the correct solution that is provided by the instructor gives us the opportunity to learn from our mistakes and move on to the next phase of the project.

      As for revisions that we had to make to the original draft, there were some cases where we inferred information from similar situations within the specification description. One assumption we made was all address followed a similar manner of being a composite attribute. Each address was to be composed of a street, city, state, and zip code. We do not think our approach was incorrect, rather it gave more information than what was needed. A mistake we did made though was the relationship with the room reservation, the reservation itself, and the room that is reserved. In our diagram, we created an identifying relation between the reservation and the room reservation. Our thought process behind making this decision was that each room reservation is dependent on the reservation. Therefore, if we were remove the reservation, the room reservation can no longer exist. We also thought that the room reservation was associated with the reservation itself, but we now see that the same argument could be made for the room and the room reservation. If we were to remove a room that is associated to a specific hotel, there can no longer a reservation for that room, and each room reservation is associated to a specific room.

HOTELPHONES

HOTELID	PHONE_NUM

HOTEL

HOTELID	STREET	STATE	COUNTRY	ZIP

OFFERROOM

DISCOUNT	HOTELID	RNUMBER	SDATE	EDATE

ROOM

RTYPE	PRICE	HOTELID	RNUMBER	CAPACITY	RTYPE	DESCRIPTION

BREAKFAST

DESCRIPTION	BPRICE	HOTELID	BTYPE

SERVICE

HOTELID	STYPE	SPRICE

CONTAINS

STYPE	HOTELID	RNUMBER	INDATE

ROOM_RES

INVOICENUMBER	OUTDATE	INDATE	HOTELID	RNUMBER

INCLUDES

NORDERS	BTYPE	HOTELID	RNUMBER	INDATE

RESERVATION

INVOICENUMBER	RDATE	CID	CNUMBER

SREVIEW

RID	RATING	TEXT	CID	STYPE	HOTELID

CUSTOMER

CID	PHONE-NO	NAME	ADDRESS	EMAIL

BREVIEW

RID	RATING	TEXT	CID	BTYPE	HOTELID

RREVIEW

RID	RATING	TEXT	CID	HOTELID	RNUMBER

CREDITCARD

NAME	CNUMBER	CTYPE	CODE	EXPDATE	BADDRESS

2. Show in words other keys.

Some potential candidate keys we found in our relational schema diagram were the invoice number and the out date in the ROOM_RES relation. This is due to only one reservation can reserve a room during some specific time. For example, an invoice number, out date, in date, hotel identification number, and the room number combination could also uniquely identify a room reservation.

3. Identify any difficulties you may have had with this phase of the project.

Some difficulties we had with this phase of the project intersected with difficulties we experienced from the first phase. A major issue we had was determining how relations would translate when this is a weak entity whose owning entity is another weak entity. All of the examples that we came across were of a weak entity identifying with a strong entity. We have never experienced a weak entity identifying with another weak entity. A case of this scenario is the room reservation entity identifying with the room entity through the comprises relationship.

We also tried to make trade offs in instances where there was multiple ways we could have translated the entity relationship model into the relational model. We mainly came across this with specialization and generalization instances, such as the case with the offer room and the three different types of reviews a customer can make. For example, we could have used option c for the offer room entity. Option c is when one takes the union of all entity attributes and puts it all in one relation. The issue here is that when subclasses have a lot of local attributes, there will be a lot of null values in each tuple. That is why we weighed our options can choose the option that we thought would optimize the specific instance.

We also had difficultly mapping the derived attributes into the relational model. We found this to be one of the shortcomings of the relational model. Thus we have concluded that neither model can show the entire picture of what is exactly happening in our hotel reservation system. One has to adopt both diagrams if one wants a clear picture. While the relational model lacks derived attributes, it does well in instances where one wants to illustrate the relationship amongst attributes, such as foreign keys, and that is exactly where the entity relationship model lacks. Thus where one model excels, the other may lack.