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Flight Reservation Project - Phase 1
EER Diagram
Relational Database Schema

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HONOR CODE

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence. I promise that I will submit only work that I personally create or that I contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

SIGNATURES: Ashwitha Venkata Kassetty, Ariella Amanuel, Katherine Baumann

Mini-World description:

Every airline company owns a number of aircrafts and it is associated with a number of airports from where it operates. Each airline has a two-letter ID from which it is being identified uniquely. For example, the ID for American Airlines is AA, and the ID for United Airlines is UA. Similarly, each airport has a three-letter ID. For example, EWR, LGA, and JFK are well known local airport codes.

A flight is operated by an airline and a specific aircraft and operates on a given set of days of the week (e.g. every Monday, Wednesday). Flights can either be domestic or international. For every flight, it must be recorded its flight number (unique only within that airline), the departure and destination airports, as well as the departure and arrival time. Customers should be able to make reservations.

Customers should first be able to search for specific flights by providing information about the departure and arrival airport as well as the date they wish to fly. The flight ticket can either be one way, or round-trip and they should be able to set if they are flexible about flight dates (+- 3 days).

A flight ticket has a unique number and is for just a single passenger. Each ticket is associated with a sequence of flights. For example, a ticket might be associated with just one flight if it is one-way or with 2 flights if it is round-trip. Each ticket must include all the associated flights and include information for the departure and arrival airport, flight numbers (along with its airline), departure date and time, and class (economy/business/first). It also has the following attributes: total fare, and date and time when ticket was purchased.

In case the class of the ticket is economy, the customer should not be able to Page 2 of 3 change/cancel their ticket unless a fee is paid. For business/first class, customers should be able to change their ticket with no fee. A customer may partake in any number of flight transactions and she/he is associated with one member account which includes a reservation portfolio, indicating all the flight history held in this account (past flights and upcoming).

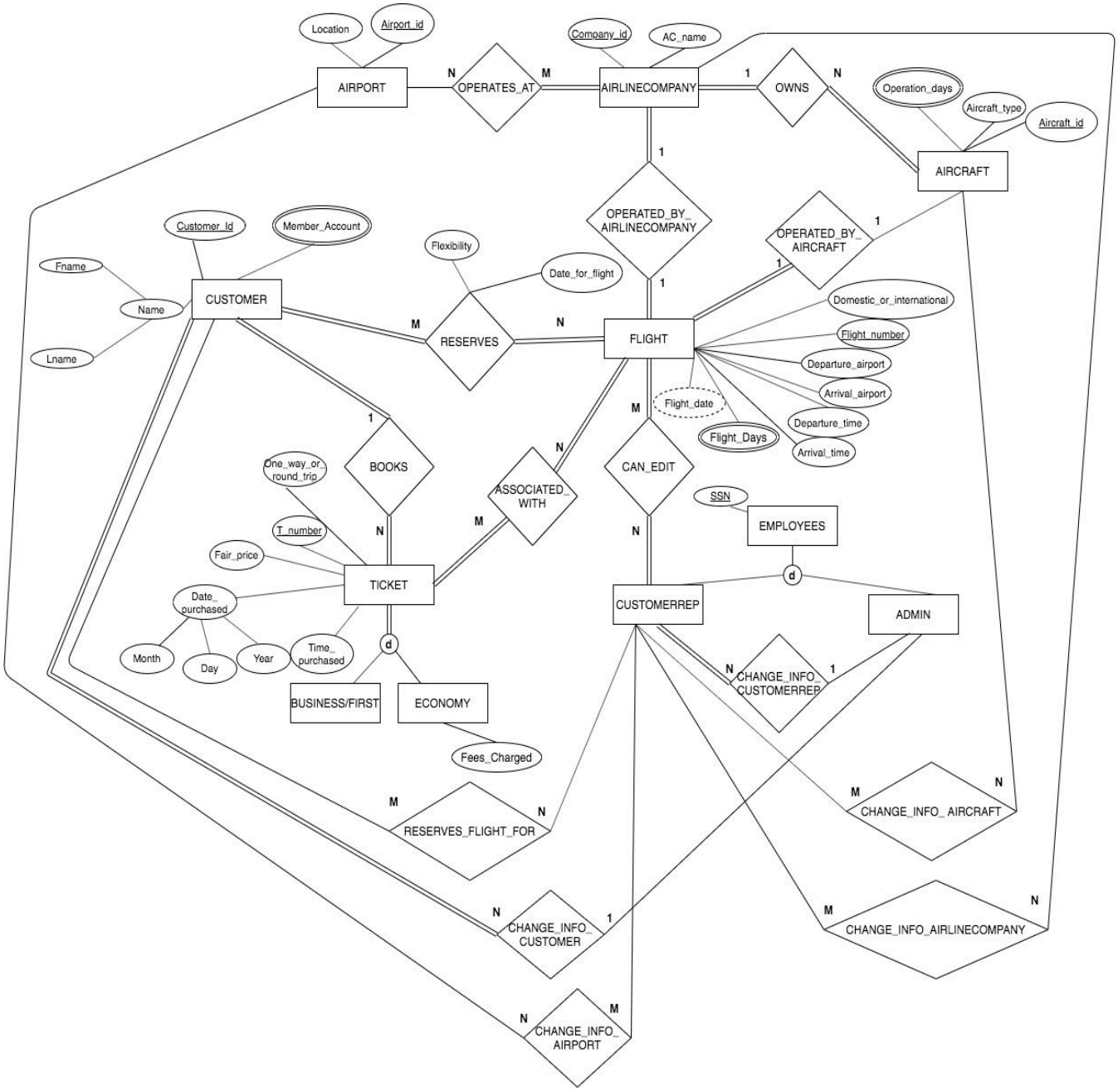
Brief Introduction

Our goal is to create a database system that allows customers to manually search for flights based on a variety of criteria, create flight reservations, and finally book flights. Administrators and customer representatives can also search for and edit reservations on behalf of customers. We are assuming our users will have limited knowledge on databases, so our goal is to make this system user friendly and easy to operate.

We used the information in the mini-world description from above in order to derive our depicted entities, attributes, and relationships.

For phase one of this project we have completed our documentation including an EER diagram and a relational database schema. Both of these diagrams were created to help the designers of the database understand the relationships between the determined entities and the entities respective attributes.

EER Diagram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ERR Diagram Description

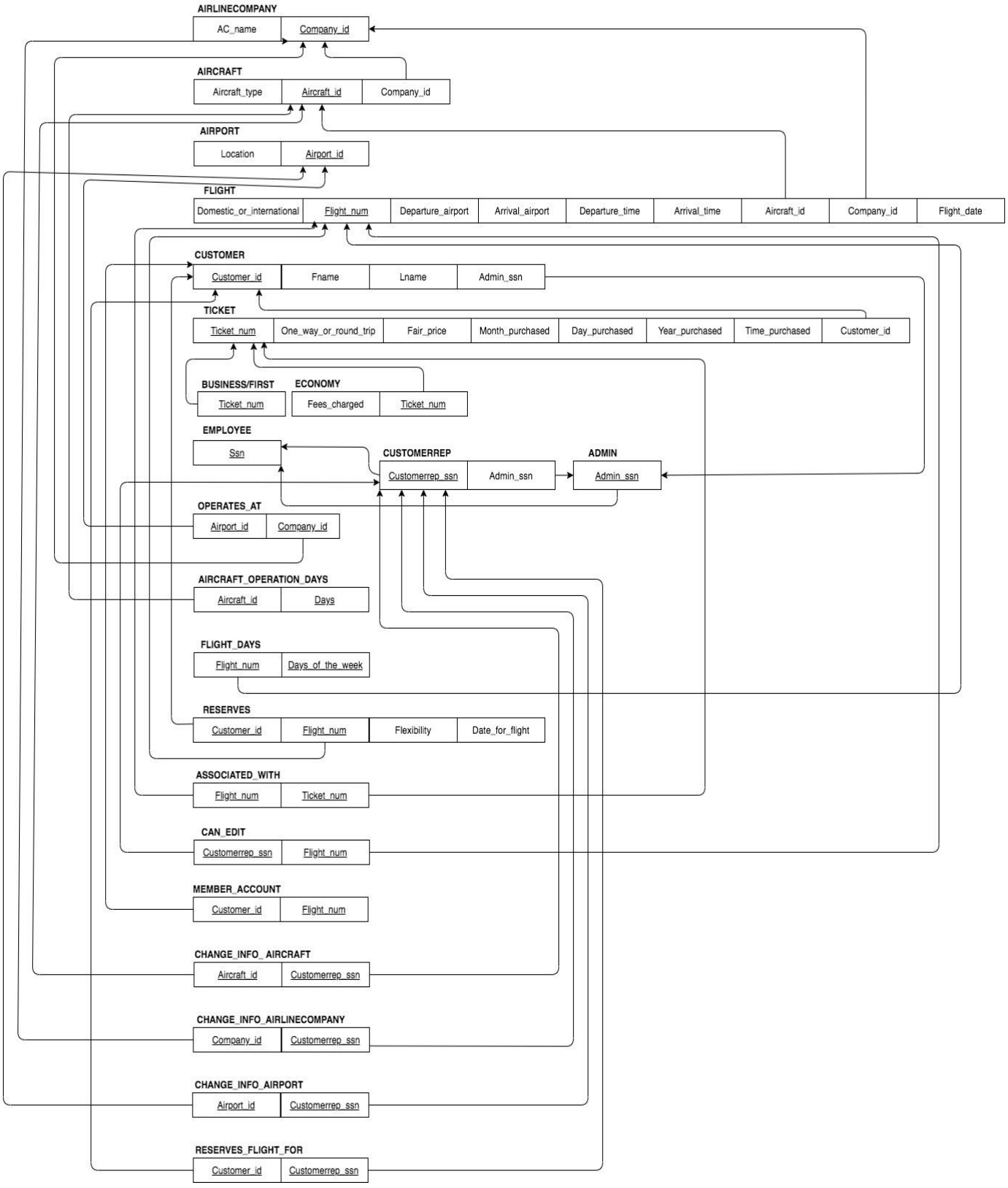
When designing our EER diagram we decided on creating 9 entities with an average of 4 to 5 attributes for each of them. We had to make a few assumptions for the relationships between our entities. Those assumptions include:

- There can be more employees at the company that just hold the title administrator or customer representative.
- Aircrafts that are owned by a specific airline company can be shared by other airline companies.
- A customer's reservation becomes a ticket once they have paid for it.

We have also accounted for some missing info. This includes SSN numbers that are used as key attributes for employees, customer ids which are used as key attributes for customers, and aircraft id numbers which are used as key attributes for aircrafts. Even though these attributes are not mentioned in the document, we used them because they are real world identifiers and attributes that are available.

We have also determined that we will not describe a few of the functionalities on either of the diagrams. We made this choice because functionalities such as “produce a list of most active flights” or “produce a list of all flights for a given airport” can be represented as queries to the database. We have represented functional requirements such as “customer representatives can make flight reservations on behalf of users” and “customer representatives can edit flight reservations for a customer “.

Relational Database Schema



Relational Diagram Description

For the relational diagram schema we specifically used option 8A as our design choice. We did this because we have incorporated specializations between our different entities. By using the mapping style 8A we were able to apply and convey disjoint, total, and partial relations. For the mapping of the relationships between entities we used primary keys of the entities so they can serve as foreign keys in the relationships.