Project Proposal: Database for Car Dealership

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Contents

1 Introduction

This document provides the initial overview for the database being developed for the final project. The following sections outline the application, the entities that the database will track, provide some examples of queries, and an initial list of milestones (with tentative completion dates).

2 Database Application

The application being developed is an inventory database for the Fast3 used car dealership. The database will allow the dealership to complete many of its required operational tasks. These tasks include (but are not limited to):

- Tracking sales
- Tracking vehicle inventory
- Tracking service orders
- Tracking part inventory

In addition to managing inventory, the database will allow the management to manage employees.

3 Entities

The database will hold all of the information related to the dealership. A list of entities and their attributes is provided below. All of the entities that will be in the database are listed. Figure 1 and 2 show the relations between them.

- Dealership
  - dealership id, address id, manager id, phone number
- Address
  - address id, unit number, street, city, state, zip code
- Vehicle Inventory
  - vin, dealership id, date acquired, cost, price, quantity

- Vehicle
  - vin, make, model, type, year manufactured, mileage, color
- Employee
  - employee id, ssn, f name, m initial, l name, address id, phone number, salary, birth date, hire date, dealership id
- Customer
  - customer id, f name, m initial, l name, address id, phome number, vin
- Vendor
  - vendor id, name, address id, phone number, type
- Part
  - part id, make, model, type, year manufactured, state, vendor id, dealership id
- Part Inventory
  - part id, dealership id, cost, price, quantity
- Service
  - service id, description, type, cost, time estimate, dealership id, part id
- Service Record
  - record, service id, customer id, vin, scheduled date, balance, amount paid, additional note
- Sale
  - refrence number, vin, sale price, sale date, dealership id, employee id, customer id

4 Queries

The following list gives some examples of queries that that will be ran against the database.

- How many employees work at a specific location.
- How many cars have been sold by each employee and the price of the average car sold by the employee.
- Who sold the most vehicles for a sales period.
- What car has the largest number of sales.
- What supplies are low in stock.
- How many customers bought a specific type of vehicle that was sold by a specific employee.
- What vendor has the cheapest parts for a specific model of car.
- What location has the highest average profit margin.

The queries listed are examples of ones that management would use to monitor the operations of the business. The information returned by the queries would allow them to know what vehicles are popular, which salesperson performs best, what supplies need to be ordered, and more.

5 Schedule

Milestones are defined for the four different core deliverable discussed in the iteration one document. The following sections detail the deliverable and their respective milestone dates.

5.1 Documentation Milestone

The documentation includes:

- Entity-Relationship diagram
- Relational data model

The tentative deadline for this milestone is 11-16-2015.

5.2 Database Milestone

The second milestone includes:

- Creating a SQL script to create the database
- Create plan for populating the database
- Document the creation and population of the database

The tentative deadline for this milestone is 11-25-2015.

5.3 SQL Milestone

The third milestone includes:

- Populate the database with sample data
- Creating SQL statements

The queries developed for this milestone will include all of those outlined in section 4. There will also be others that are developed as the project progresses.

The tentative deadline for this milestone is 11-31-2015.

5.4 Presentation Milestone

The fourth milestone includes:

- Creating a PowerPoint presentation
- Assigning each member different talking points
- Practising the presentation

The tentative deadline for this milestone is 12-07-2015.

6 Work Distribution

The work distribution for each milestone will be determined at the first meeting that focuses on the deliverable. For now, everyone will be assigned to work on all aspects of the first deliverable. Once the first milestone is complete, we will be able to device the work in a more manageable manner.

7 ER-Diagram

Figure 1 shows the ER diagram developed for the Fast3 database.

7.1 Assumptions

- Vehicle only purchases by one customer.
- Customer can have vehicle even though they did not purchase vehicle from dealership.
- Customer may own multiple vehicles.
- It is commission based job so only one salesperson associates on one vehicle sale.
- Employee only can work at one dealership.
- Dealership may not get part that they ordered from vendor.
- Some of services do not require using part (e.g. balancing tire, diagnosis engine, etc).

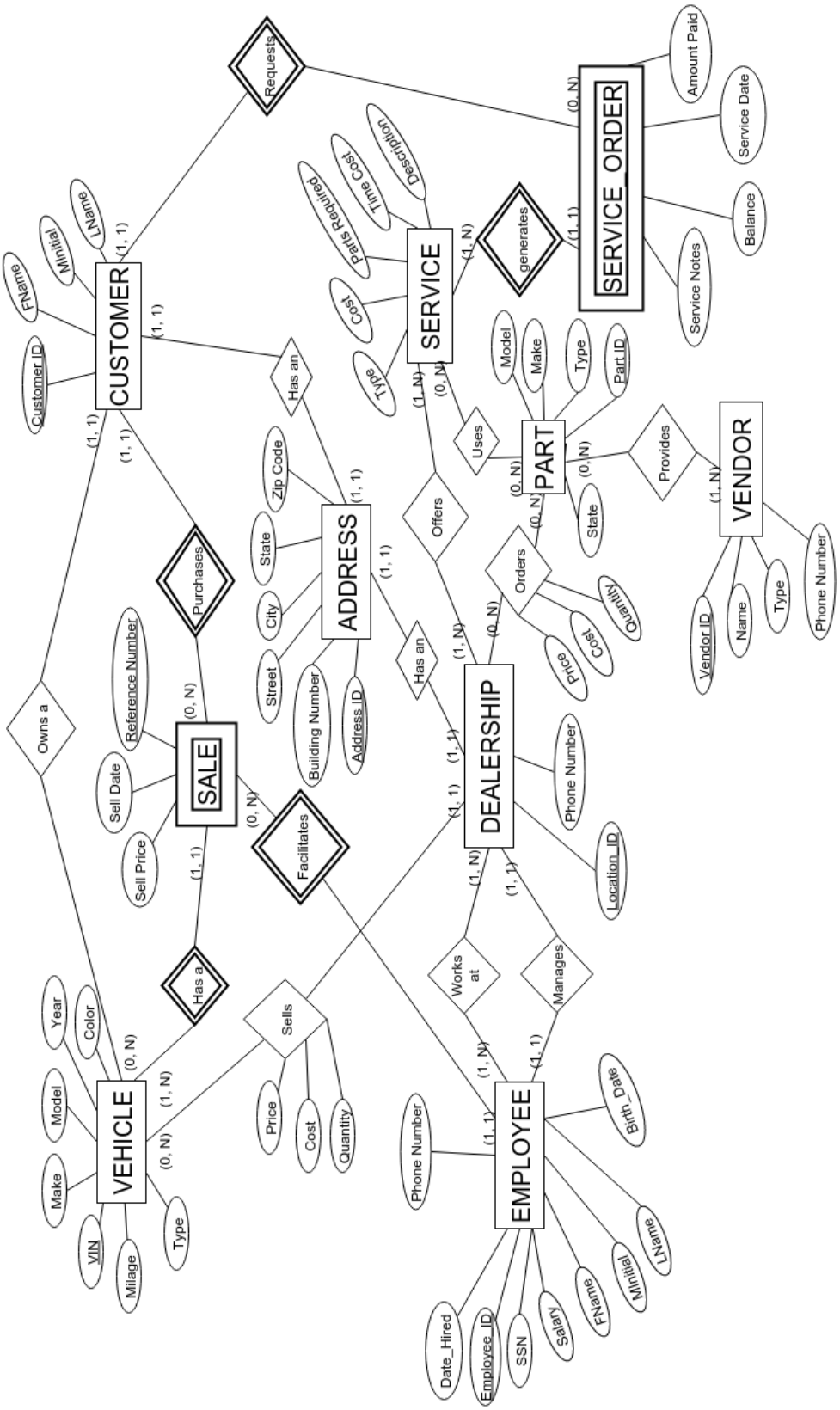

Figure 1: ER Diagram for the Fast3 database.

8 Relational Model

Figure 2 shows the relational model that was developed from the ER-diagram.

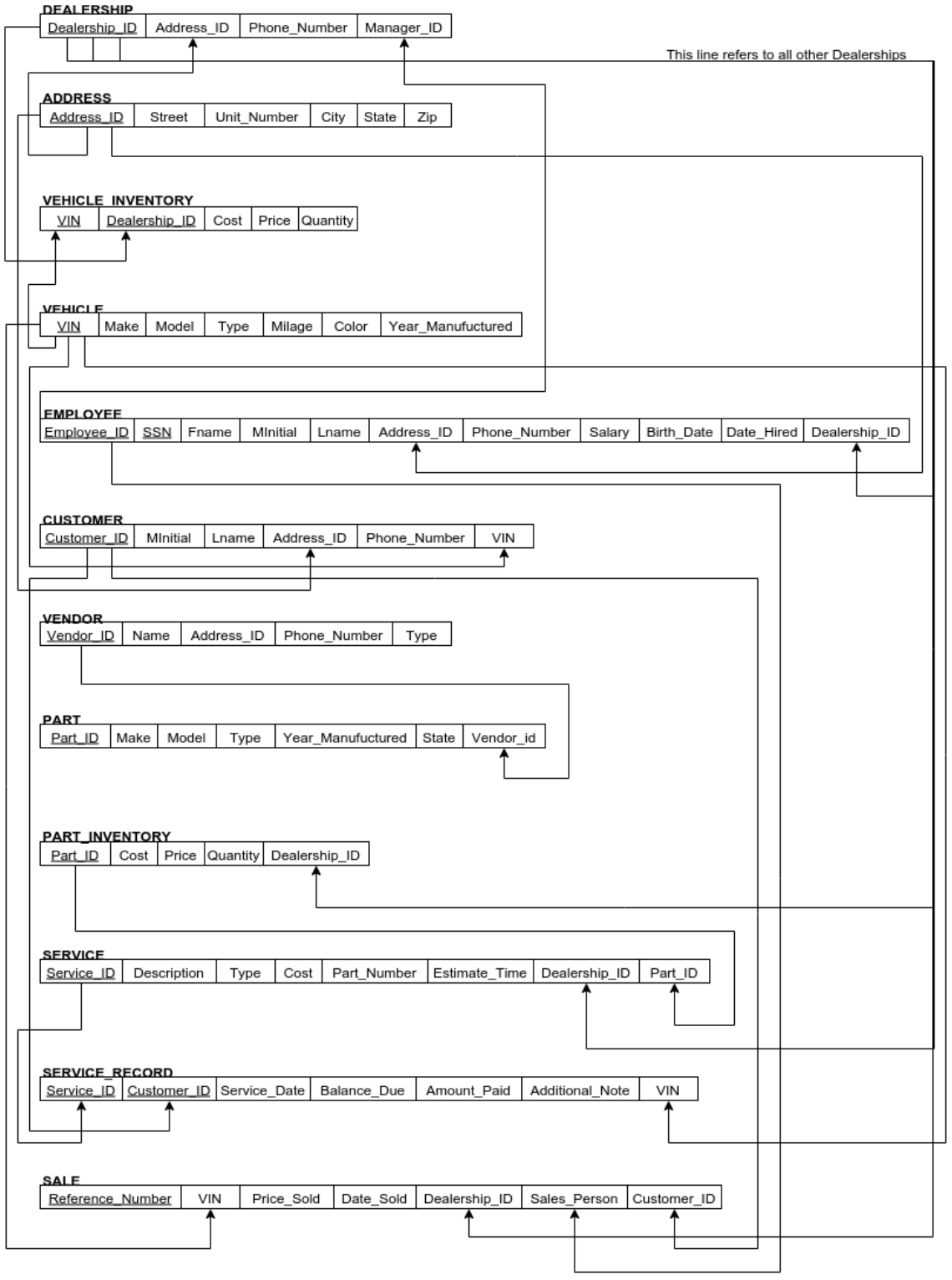

Figure 2: RM Diagram for the Fast3 database.

9 Data Generation

To populate the database, we will use a combination of data generation scripts and manual data generation. Some of the tables will only need a to contain a small number (less than ten) entities to test the database; however, we will benefit form having many more in others.

To generate the data, a combination of bash and awk scripts will be written. All of the text processing will be done with awk; names, addresses, and phone numbers will be generated with rig; and bash will be used to glue it all together. Listing 1 shows the function used to generate the SQL statements to insert and address.

An initial script has been written for this iteration to generate addresses that will be used in the database. The script can be easily expanded to generate customers, employees, vehicles, parts, service orders, and sales. The remaining entities do not need a large number of instances, and therefore, can be generated by hand.

Listing 1: Function used to generate an Address.

```
function printAddress {
  DATA=$(rig | awk '
    BEGIN{
          aidx=1;
          srand();
       }
       {
         if (NR==2) {
           fieldCount=split($0,streetAddr," ");
           ADDRESS[aidx++]=streetAddr[1];
           for (i=2; i<=fieldCount; i++) {
             street=street" "streetAddr[i];
           }
           sub(/^[ ]+/, "", street);
           ADDRESS[aidx++]="\x27"street"\x27";
```

```
16          } else if (NR==3) {
17            split($0,addr," ");
18            sub(/,/, "", addr[1]);
19            ADDRESS[aidx++]="\x27"addr[1]"\x27";
20            ADDRESS[aidx++]="\x27"addr[2]"\x27";
21            ADDRESS[aidx++]="\x27"addr[3]"\x27";
22          }
23        }
24     END{
25          print ADDRESS[1]", "ADDRESS[2]", "ADDRESS[3]", "
               ADDRESS[4]", "ADDRESS[5];
26         }')
27
28   echo -e "INSERT INTO ADDRESS VALUE(NULL, "$DATA");"
29 }
```