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## Abstract:

The goal of assignment 3 was to provide ER diagrams that would follow the process of integrating two separate corporations. The first deliverable was to provide an ER diagram of the schema for a Dealership of pre-owned cars, followed by an ER diagram of the database design established for assignment 1 of a car dealership focused on new cars. The assignment requires documenting the process of merging the two schemas. Finally, an ER diagram of the merged schema is provided.

## Preface:

As part of the data curation process, it was requested that tables could be identified as entities and relationships. After reading a publication on database design, (Earp, 2003), I have documented entities, weak entities, and relationship tables.

When determining if a table was to be considered an Entity, a Weak Entity or a relationship, the following principals were used. If a table represented a physical entity, or a concept that could exist independently of other tables, it was considered an *entity*. If a table represented a physical entity, or a concept but could not exist independent of additional supporting tables, it was considered a *weak entity*. If a table existed to link information together, it was considered a *relationship*.

## Deliverable: Dealer of Pre-Owned Cars ER Diagram

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Figure 3.1 Create an ER diagram for Pre-owned dealer database, as described in the attached file

The customer table is an entity since is is something that physically exists, a customer and has attributes. It has a one to many relationship with the sale table since a customer can participate in many sales. The customerName and phone were selected as a uniqueness constraint on the table.

The associate table is an entity since a sales associate physically exists and contains a name. It could have been considered an attribute of a sale, however this would have resulted in duplicates in the sales table so to avoid duplicate entries into the sales table, it was placed in its own table. One associate may have many sale records.

The vehicle table is an entity since a vehicle physically exists as vehicles can be bought and sold and has an attribute of a sticker price. One vehicle may be involved with many transaction activities, as it can be bought and sold in different transactionActivity records.

The transactionActivity table is considered a weak entity. Conceptually a transaction activity exists and has an attribute of a price associated with it but cannot exist on its own without something to sell or by, so it is a weak entity. One transaction Activity can be involved in one sales to transaction relationship. A sales transaction may have 1 or many transaction activities. This does allow for duplicate entries in the transactionActivity table (for a vehicle and price), but these are in-deed not duplicates (the same car maybe bought or sold at the same price in a separate sale) so the primary key being an identity column will ensure that the transactions are represented in the table. Keeping these duplicates will enable maintaining the lineage of transactions that have occurred for a given vehicle.

The sale table is also considered a weak entity. It represents a group of transactions that contain attributes but cannot exist on its own so it is considered to be a weak entity.

The saleTransactions table is a relationship table since it is tying together the transactions with the sales. One sale may have many transactions. This table could have be merged into a foreign key constraint in the transactionActivity table, but that would not have provided clear delineation between entities and relationships, so it was placed into a separate table.

To establish the model provided in figure 3.1, several data curation methods were required to be applied. The notes

## Deliverable: Car Sales Dealership ER Diagram from Assignment 1

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Figure 3.2 Create a separate ER diagram that reflects the schema you designed for Assignment 1

## Deliverable: ER diagrams representing each step of your integration process, with each step accompanied by a description (in narrative prose) of your integration process

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Figure 3.3 Migration of customer Entity into customerPurchasers Entity

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Figure 3.4 Migration of the vehicle and vehicleInventory tables

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Figure 3.5 Migration of sale, saleTransaction and TransactionActivty with saleTransaction entity

## Deliverable: Final ER Diagram

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## Difficult Decisions

Based on the information provided by the pre-owned dealership, it was difficult to justify adjusting the table design to accommodate an environment that did not appear place a high value on data quality. Revising the logical model to accommodate the additional dataset would at minimum require the views that were created to be re-created to allow for existing reports for the car dealership introduced during assignment 1.

## Appendix

### 3.A Population of Tables for Assignment 3 for the Pre-Owned Car Sales Dealership are found below for reference

|  |  |  |
| --- | --- | --- |
| vehicleId | VIN | Sticker |
| 1 | 1BJ38LO45129JUT4I | 9000 |
| 2 | 25D9MEI2NMDLPDK85 | NULL |
| 3 | 6S58W2S3F6G8G4D1D | 7000 |
| 4 | 74EHF4F8YT56SMZA9 | NULL |
| 5 | 1E02D58GMZ5CP9D87 | 11000 |
| 6 | 81S2Q4JFMEWL54218 | NULL |
| 7 | 526DOEM78D9E124DL | 8500 |
| 8 | 5UD5LODK8W62DLKIEM | 9700 |
| 9 | 256DKEM74DOLF8521 | 12500 |
| 10 | 71DE6E55R2F3Q4A1Z | 11000 |

Figure 3.A.1 vehicle table

|  |  |
| --- | --- |
| associateId | associateName |
| 1 | Kylo Ren |
| 2 | Padme Amidala |
| 3 | Leia Organa |
| 4 | Anakin Skywalker |
| 5 | R2-D2 |

Figure 3.A.2 associate table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| customerId | customerName | phone | street | city |
| 1 | Baggins, Frodo | 202-555-0109 | 7405 Oak Meadow Road | Elk Grove Village |
| 2 | Gamgee, Samwise | 701-555-0109 | 9372 Stillwater Ave. | Champaign |
| 3 | Took, Peregrin | 202-555-0182 | 24 West Beechwood Drive | Urbana |
| 4 | Brandybuck, Meriadoc | 202-555-0147 | 8 Hall Lane | Savoy |
| 5 | Wormtongue, Grima | 701-555-0136 | 628 Center Rd. | Zionsville |
| 6 | Bolger, Fredegar | 202-555-0179 | 9827 Morris Ave. | Bloomington |
| 7 | Goatleaf, Harry | 701-555-0137 | 6 Blue Spring Court | Des Plaines |
| 8 | Willow, Old Man | 701-555-0192 | 7186 Wintergreen St. | Champaign |
| 9 | Angmar, Witch-King of | 701-555-0190 | 12 Rockaway Street | Urbana |
| 10 | Gandalf | 701-555-0172 | 7390 E. Glenridge Rd. | Rantoul |

Figure 3.A.3 customer table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| saleId | salesLog | saleDate | associateId | customerId | note |
| 1 | 10123456 | 2/4/2016 | 1 | 1 | NULL |
| 2 | 10123461 | 9/6/2016 | 1 | 6 | Discount applied: Autumn sales event |
| 3 | 10123464 | 9/27/2017 | 2 | 9 | Financing given |
| 4 | 10123457 | 8/1/2016 | 3 | 2 | NULL |
| 5 | 10123462 | 5/2/2017 | 4 | 7 | Discount applied: senior citizen |
| 6 | 10123463 | 6/3/2017 | 4 | 8 | NULL |
| 7 | 10123458 | 7/6/2017 | 4 | 3 | NULL |
| 8 | 10123459 | 6/5/2017 | 5 | 4 | Financing given |
| 9 | 10123460 | 1/5/2016 | 2 | 5 | NULL |
| 10 | 10123465 | 1/1/2016 | 3 | 10 | Discount applied: repeat customer |

Figure 3.A.4 sale table

|  |  |  |
| --- | --- | --- |
| transactionActivityId | vehicleId | price |
| 1 | 1 | -6200.00 |
| 2 | 5 | -1450.00 |
| 3 | 6 | -3500.00 |
| 4 | 8 | 9500.00 |
| 5 | 5 | 9995.00 |
| 6 | 9 | 11999.00 |
| 7 | 2 | -1205.00 |
| 8 | 3 | 6800.00 |
| 9 | 3 | -4200.00 |
| 10 | 1 | 8600.00 |
| 11 | 4 | -1025.00 |
| 12 | 7 | 8000.00 |
| 13 | 7 | -5500.00 |
| 14 | 10 | 10100.00 |

Figure 3.A.5 TransactionActivity table

|  |  |  |
| --- | --- | --- |
| salesTransactionsId | saleId | transactionActivityId |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 7 | 8 |
| 9 | 8 | 9 |
| 10 | 8 | 10 |
| 11 | 9 | 11 |
| 12 | 9 | 12 |
| 13 | 10 | 13 |
| 14 | 10 | 14 |

Figure 3.A.6 saleTransactions table

# References

Earp, S. B. (2003). *Database Design Using Entity-Relationship Diagrams.* Auerbach Publications .