

Used Car Sales Management Database

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Database Purpose:

The purpose of this database is to maintain the data used to track and report used car sales; manufacturers and dealership performance related to sales trends; market research upon manufacturers, car style, customer preferences. This database will be used by customers, sellers (individual or dealership), and system administration.

Business Objectives:

- Supply insights to sellers for sales enhancement.
- Provide manufacturers data report among marketing and sales performance.
- Allow customers to research potential used cars for sale, understand the market, and contact sellers or dealership.
- Oversee the credibility of transactions and prevent fraud.

Business Rules:

- A seller must indicate whether the seller is from a dealership or an individual.
- Customers can save their favorite car information, such as car model, body color, vehicle year, preferred mileage, and price.
- Sellers are able to see potential customers who are interested in related sales.
- Each transaction should indicate only one buyer, one seller, one car.
- A sale should only be for existing car models that are from a credible manufacturer. In other words, the database should have the record of its manufacturer.
- A car must hold a valid inspection report before entering the market.
- Colors must be able to be defined by the basic colors from W3C (World Wide Web Consortium).
- Daily procedure on bank account numbers and credit card information is performed.
- Whenever a record of fraud report is inserted, related report tables need to be generated.

Design Decisions:

| <i>Schema</i> | <i>Entity</i> | <i>Entity Purpose</i> | <i>Relationships</i> |
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| Users | Customer | The main purpose of this database is for car sales. For any sales to happen, customer is one of the key components. This entity mainly stores the detailed info of each customer. | As one of the core entities, the primary key, CustomerID, relates to Address and ContactInfo so that any contact information could be retrieved. On the other hand, it is used as references by CustomerPref entity to indicate specific preferences for each customer. Also, it would be utilized for each sales record in Transaction and Payment. |
| | Seller | The main purpose of this database is for car sales. Seller is also an essential element in each sale. As a result, this entity includes the information of each seller. | The primary key, SellerID, is used similarly as CustomerID in Customer. Its primary key is also responsible for each car in CarSalePre and CarForSale, so that customers and administration know who oversees a specific car. Lastly, it is also utilized in Transaction and Payment to complete each sale. |
| | Administration | For each sale, a third party is introduced. We refer to them as administration. Additionally, administration is also in charge of data integrity. | The primary key, AdminID, is used similarly as CustomerID in Customer. Furthermore, AdminID is used for validation and verification in CarSalePre, Transaction, and Payment. Finally, the primary key is also used to indicate the person who reports fraud in FraudReport. |
| | Dealership | One specific type of seller. This entity includes additional insights for sellers. | The dealership entity is related to seller entity to indicate additional insights. |
| | State | Indicate a state and its country. | Used as a reference in Address to specify the name of a state and its country. |
| | Address | Indicate an address. | Refers to the primary key of State, to acquire specific information on state and country. |

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| | ContactInfo | Indicate contact info of specific users, including customer, dealership, and admin. | See entity purpose. |
| Preference | CustomerPreference | To enhance and perform market research, customers will be able to provide preference for potential car sales. | Utilizing the primary key in Customer to specify each customer's preference. On the other hand, its primary key relates to ModelPref and ColorPref for more details. |
| | ModelPref | An associate entity of CustomerPreference and CarModel to indicate model preference of each customer. | A many-to-many relationship between CarModel and CustomerPreference. |
| | ColorPref | An associate entity of CustomerPreference and ColorIndex to indicate the color preference of each customer. | A many-to-many relationship between ColorIndex and CustomerPreference. |
| Car | CarModel | Indicates an existing car model | References Manufacturer (ManufacturerID) to indicate the source of a model. On the other hand, the primary key is also being referred to by ModelPref. |
| | CarBodyStyle | Indicates car body style | See CarSpecification. |
| | CarTransmissionStyle | Indicates car transmission style | See CarSpecification. |
| | Manufacturer | Indicates car manufacturers. | See CarSpecification. |
| | ColorIndex | Indicates colors. | See CarSpecification. Also being referred to by ColorPref. |
| | CarSpecification | The main table in Car schema. An association table of all the specifications of a car. | References CarModel, CarBodyStyle, CarTransmissionStyle, ColorIndex. |
| <i>Inspect</i> | CarInspectionReport | Used as supporting material for admin to ensure one of our business rules, cars need to be inspected before entering the market. | Refers to CarList. On the other hand, attribute, "VerifyStatus", act as a table-check constraint. In other words, the car needs to have a valid inspection report to enter the market. |
| | Inspector | Specific information on the | See CarInspectionReport |

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| | | inspector responsible for each report. | |
| | FraudReport | A key indicator for fighting fraud. This entity keeps records of suspicious activities that involve customers, sellers, cars, transactions, or inspectors. | This entity refers to Administration (AdminID) to indicate the admin that files and oversees the report. Additionally, it may relate to any entity that involves, including Customer, Seller, CarInspectionReport, CarForSale |
| Sales | CarList | A table to represent the in-stock cars. These records will then be passed on to InspectionReport and CarForSale for further procedures | See CarInspectionReport and CarForSale. It also refers to Carspecification to retrieve the detailed info for each car. |
| | CarForSale | After the car being validated by the administration, it would be posted on the market. This entity includes specific information on the car, including the color, model, milage, etc. | Conducting a one-to-one relationship with CarSalePre, to make sure there is solid validation of the car. As a result, it refers to the same entities as CarSalePre. Furthermore, the primary key relates to CustomerInterested, so that sellers can find potential customers easily. Lastly, the primary key is also utilized by Transaction. |
| | CustomerInterested | A specified record that indicates customers that are interested. In fact, the seller in charge of the car will be able to check and make plans based on this record | An associated entity for a many-to-many relationship between Customer and CarForSale. |
| | Sales | One of the main purposes for this database is to keep track of sales and make sure of the credibility of each record. | This entity refers to Customer, Seller, CarForSale, and Administration to specify all the participants including customers, sellers, car, and the third party. Then, the primary key relates to Payment in order to store each payment record. |

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| | Payment | To complete a sale, payments are made. This entity keeps all the payment records for each sale. | See Sales |
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