

Database mandatory 1

Car builder

SD20I.

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Problem description

A relational database is required for our application which allows customers to build a car from parts, in a webshop.

In order to create a car, the customer has to choose which predefined car body they want as well as tires, engine type, fuel type, shade of window tint, color, spoiler or not.

Or the customer has the option as well to pick parts based on different manufacturers.

When a car has been put together by a customer, an order list with all the parts is generated and the list can be seen as a full car.

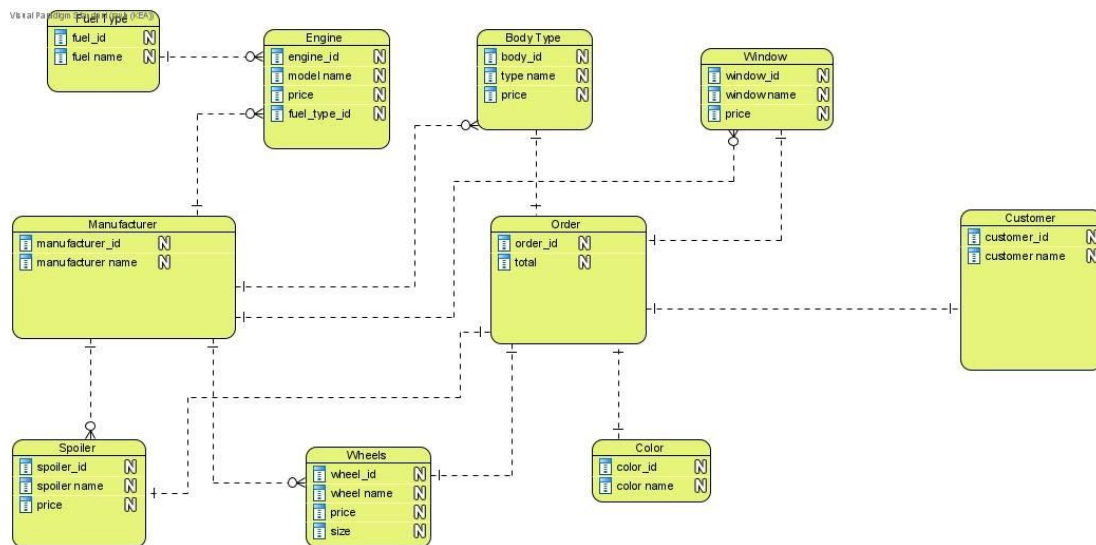
The order list also contains a foreign key to the customer as well as the car part in order to link it all together.

Diagrams.

The three diagrams below are showing our database design as a conceptual, logical and physical diagram.

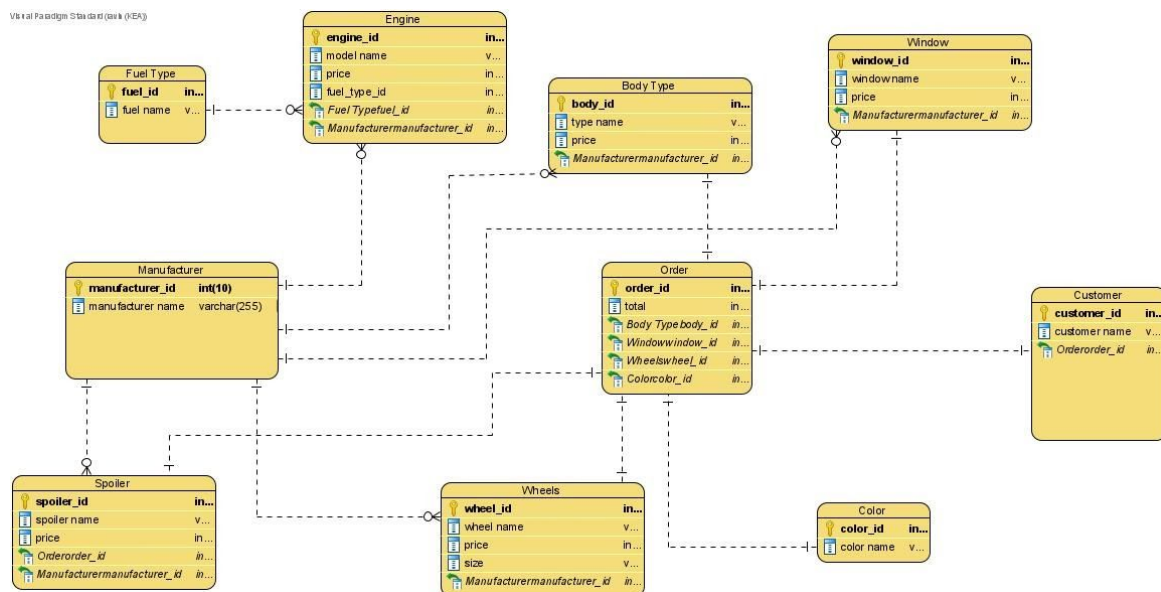
Conceptual data model.

This conceptual data model shows a map of its concepts and relations.



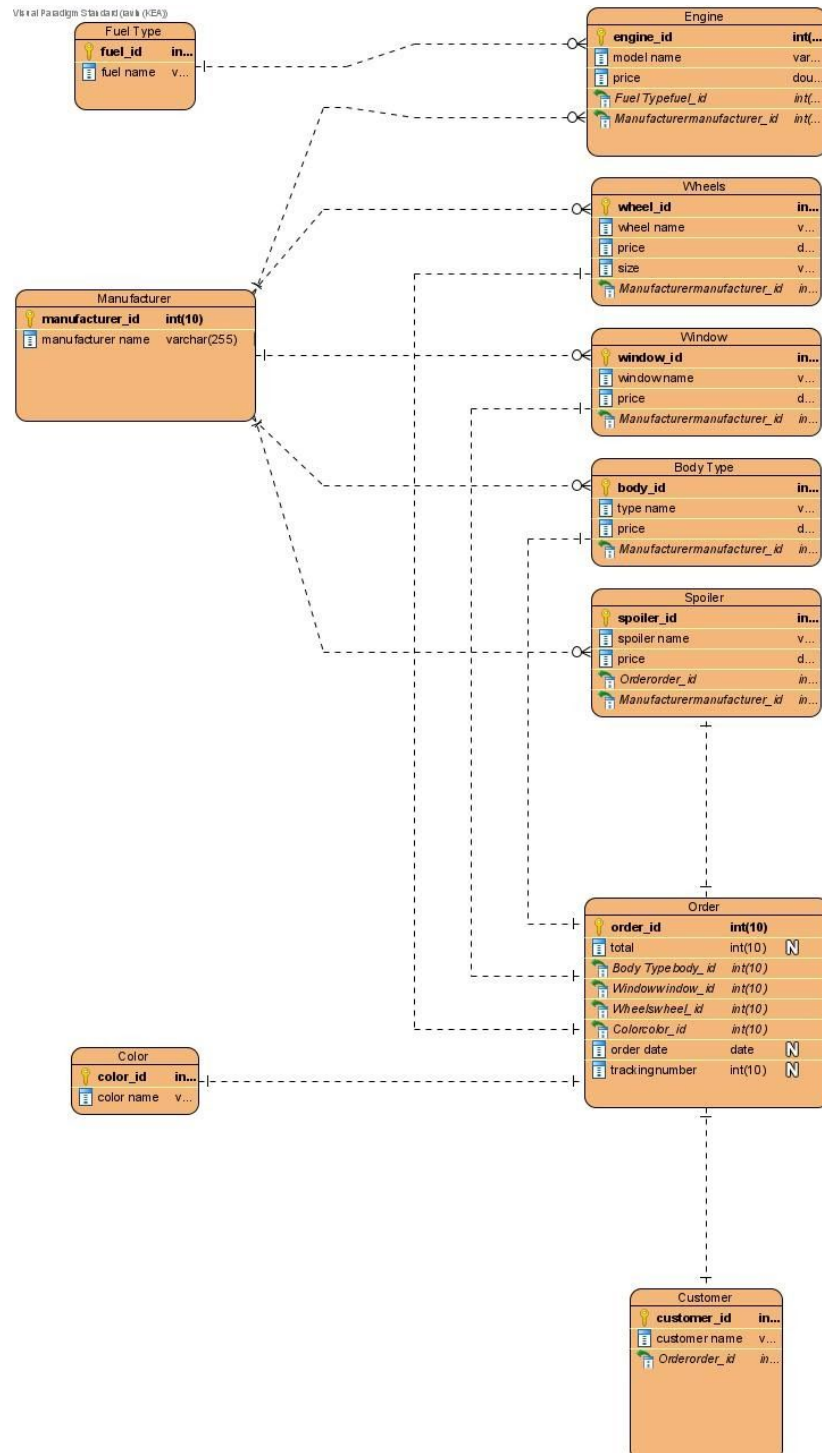
Logical.

This logical database model shows the mapping of the conceptual schema of the application domain into a schema for the data model for the database.



Physical.

This physical data model shows how a user will access the database and what data is most commonly used. As we move on, it will also show which columns will have indexes.



Choice of database type.

As the assignment pointed out, we had to work with at least one sql database and therefore we chose to with MySql.

Mysql is a relational database allowing for primary key, foreign key relations across tables. Mysql is very secure and reliable with many advanced features. It also offers unmatched scalability even for big warehouse operations.

Explanation of relevant data types.

We chose varchar because our string length doesn't exceed 255 characters. For our ids we chose type integers for the primary keys (auto-incremented).

Explanation of relevant primary and foreign keys.

Id's are all set at primary keys in their respected tables.

We are linking all products with a foreign key to their manufacture. In our current ERD diagram model we link the different product tables to the manufacturer and to the order. But we see it as a problem in the future. So we will be changing it so that every product refers to a product type and to its respective stock in the stock table. With this model it will be easier to build the Order_item table, which will be referencing the Customer table and the Product table. This way the database will be scalable in the future.

Explanation of general and relevant specific choices for indexes.

We do not have any index at the moment, but they will be implemented as the project grows in the following weeks. We plan to maybe index the countries of our customers to check where we have most of our sales.

Explanation of general and relevant specific choices for constraints and referential integrity checks.

We are planning on using foreign constraints on the different product tables (Wheels, Spoiler, Engine, etc...) because we can delete the products but can not delete the manufacturer without deleting all the products of that Manufacturer first.

Auditing. Explanation of the audit structure implemented with special attention to the function of triggers.

One of our future triggers for our new database we will build will be :

- If we delete a product we delete in stock.
- Every time we complete an order/purchase (insert a new row in order), we create a trigger that will insert a new row with the order_date, product_name, price and manufacturer to the Audit table.

Bibliography, including all sources referenced in the report.

https://www.w3schools.com/sql/sql_create_table.asp - For creating the database

https://www.w3schools.com/sql/sql_insert.asp - For inserting the first test data

https://www.visual-paradigm.com/support/documents/vpuserguide/3563/3564/85378_conceptual.l.html - For creating the diagrams

<https://docs.github.com/en/enterprise/2.15/user/articles/generating-a-new-ssh-key-and-adding-it-to-the-ssh-agent> - When cloning our github repository it made us create ssh keys to be able to access it.