



Group 3

Proposal Report

CS 353 - 02

NovaCars

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Contents

Introduction	3
Description.....	3
Why do we need the database?	3
How will we use the database?	4
Limitations and Requirements.....	4
E/R Diagram	6

Introduction

In order to manage large datasets in the most efficient way, using database management systems is necessary. Our project is creating a database management system for an auto-service which is for a famous car company. As the service center needs to keep track of a lot of data about departments, employees, customers and car repair histories, etc. a database management system will be formed. The design for our auto-service data management system will be completed in 3 main stages: proposal, design and implementation.

This report is the first design stage of our auto-service database management system, which is the proposal. Proposal will include the description of our application, why and how this database is going to be used, its requirements, limitations and the conceptual design of our database using the E/R model.

Description

In our auto-service database management system the service center is the main organization. It keeps track of all the departments, employees and spare-parts. Each service department is responsible for a different type of auto-related service and it consists of employees who complete these services(operations).

Our auto-service database management system should provide different functions for all customers, employees and suppliers, which are the 3 main roles in the system. They all can reach their profiles via their login information and change their profile as they wish. Customers are able to search for different service centers for different operations that can be done to their autos. Also they can see their car repair history for any car they own. Suppliers can also search through different service centers and they can reach the information about the number, type and model of the spare parts each service center has and they can provide spare parts to a certain service center. Employees of the auto-service can have different roles such as managing or working in a service department of the service center. Also, employees should be able to complete transactions which are the operations that could be done to a certain auto type with the spare parts which are provided by the suppliers. The manager of a certain service department can update the information about that department.

The system shows the model of different parts of any auto as well as the owner of the auto. This information can be accessed by the customer and the employees in the system via the user – friendly system we will provide.

Why do we need the database?

Auto management companies have lots of customers and divisions with high number of employees. Due to that we should use a database to keep track of the customers and their cars, information about the service centers such as the divisions in a service center, information about the transactions and the quantity of spare parts to replace on cars if needed. This database will provide information whenever needed it with minimal effort.

How will we use the database?

Customers and their cars will be kept in different tables since a customer can have more than one auto. Spare part suppliers will also be in the system as well so that the information about spare parts can be kept track of if an auto needs a certain part. Transactions between customers and service center will be stored which stores the type of transaction done and the employee that has done the transaction. With the transaction list a customer's history and the employee's history will be kept on record.

Limitations and Requirements

Entities and their limitations:

Service center:

- This is the main auto service organization.
- A service center must have one or more service departments

Service department:

- A service department is a specialized part of the service center.
- Each service department must have one manager and one or more employees.
- Service departments must provide operations.
- Each employee can only work in one service department.

Operations:

- An operation is defined as any auto-related service (e.g. cleaning the car, repainting the car, changing the tires of the car, fixing the engine of the car etc.).
- Operations must be provided by specific related service departments.
- An operation must have a transaction associated with it.

Transactions:

- Transactions may include one operation done for a fixed price or they can be defined as purchases from suppliers.
- Transactions must be completed by one or more employees.
- Transactions may be associated with at most one car, and with multiple spare parts (of the same type) and with one customer.

Spare parts:

- These are defined as any technical parts of an auto.
- Spare parts must be stored in service centers and they must have suppliers.

Suppliers:

- Suppliers must provide spare parts.
- Suppliers can also be customers as well.

Customers:

- A customer may own one or more autos.
- Customers must have a history of transactions.

Employees:

- They are defined as anyone employed in the service center the application is subject to.
- Each employee works in exactly one service department.
- Employees complete transactions. Multiple employees can participate in one transaction.
- Employees can also be customers as well.

There are three main roles in our system: *Customers*, *suppliers* and *employees* (managers, admins, others).

- Customers, suppliers and employees all have e-mails and passwords for authentication.
- Customers, suppliers and employees should be able to adjust their personal information on their profiles.
- Customers should be able to search through service centers and operations provided by these service centers.
- Customers can add autos to their profile and make transactions online.
- Customers can also see the previous history of their transactions and repeat them if necessary.
- Customers should not be able to make transactions if the required spare parts or operations are not provided by the service center of their choice.
- Suppliers should be able to search through service centers.
- Suppliers can see the quantity, types and models of the spare parts these centers provide.
- Suppliers should be able to make transactions online related to selling these spare parts.
- All employees should be able to search data about the entities in the system, however not all employees should be able to adjust or delete all data. For example, only the department manager should be able to adjust the data related to their service department entity. Generally, employees who have access to edit rights in the system are either department managers or database administrators.
- Any transaction request made by customers or suppliers should be validated by a respective employee before any change is made to the system.

E/R Diagram

