

IT-214 DBMS PROJECT

Prof. PM JAT



Title: Supply chain management of Accelero Motors

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Objective:

Our database aims to optimize the whole supply chain management process of Accelero motors from production to sales and distribution. The database attempts to effectively manage important features including supplier-relationship, transaction process, manufacturing and dealership.

Scope:

The envisioned database system revolutionizes the management of the car company's supply chain, integrating processes from production to sales and distribution.

The application users: The car company Accelero motors can use this database to provide and manage important data that is required for a smooth supply chain management.

Application users:

Company

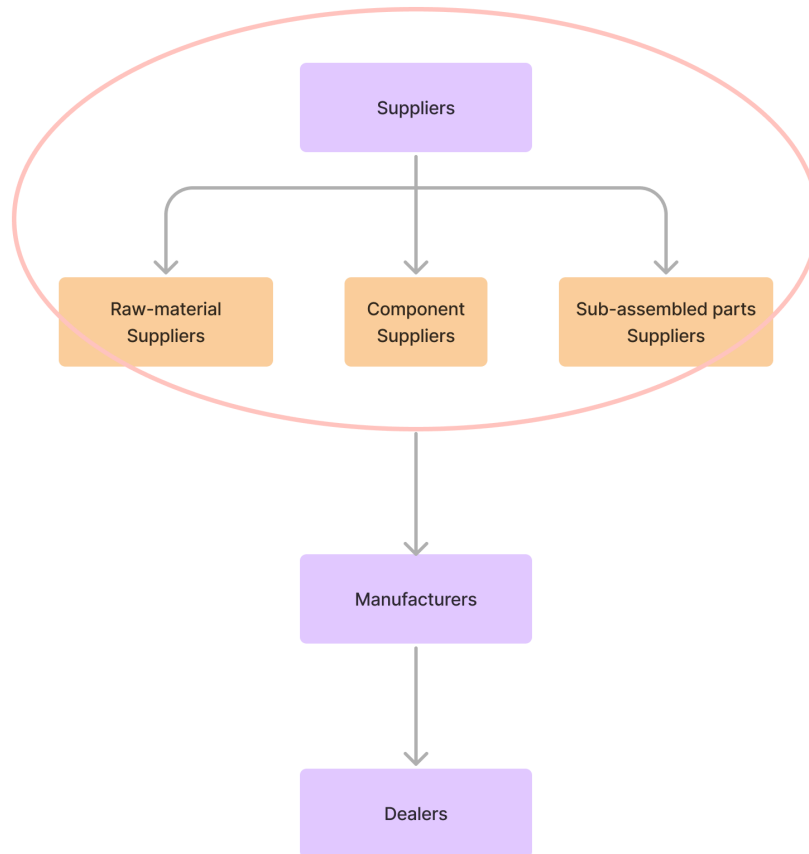
The car company - Accelero motors is the application user here. To ensure an efficient supply chain the company is required to add and manage details of their suppliers, Manufacturers and Dealers. The company Accelero motors itself is the manufacturer here.

The company further divides their suppliers into 3 categories:

- Raw material suppliers: They supply raw materials like steel, plastic, rubber, glass, etc to the manufacturer of the car.
- Component suppliers: They supply components like brakes, seats etc to the manufacturer.

- Sub-assembled parts suppliers: They assemble car components like the engine, gearbox, clutch system, air-conditioning controls, control module(electrical) etc and then supply it to the manufacturer.

How the supply chain is formed:



Use cases:

Accelero motors can use this database to manage their supplier-relationship, manufacturing details and distribution to dealers.

Suppliers supply various parts and necessary components of cars to the manufacturers.

Following are the use cases regarding to suppliers:

1. Registration according to category (ie: raw material supplier, component supplier, sub-assembled part supplier)
2. Add and manage self-produced parts details
3. Add and manage outsourced(locally/globally) parts details
4. Add and manage details of supplied parts
5. Add and manage transaction details

Supplier Registration

The company is required to register the associated suppliers to the database. While registering, the company must classify the suppliers under their respective categories (Such as Raw material supplier, Component supplier, and sub-assembled parts supplier). Let suppliers have their unique supplier ID. Along with that, the other essential details like their name, contact details and address.

Add and manage self-produced parts details

Details of suppliers who produce the parts for the car company on their own are required to be added. The details will be part ID, part name, production time, production cost and production quantity.

Add and manage self-produced parts details

Information of suppliers who outsource the parts from elsewhere is required for the company to keep a track of whether the parts are outsourced globally or locally.

Let parts also have the country associated with them, the company should provide a country name for that and invoice details from where the suppliers have imported the parts. These details are importing date, quantity imported, part name, unit price, shipping charges, etc.

Upon receiving the parts, details like the receiving date, ID associated with every part need to be provided.

Add and manage details of supplied parts

The company is required to keep a track of parts that are supplied to the manufacturers, details such as manufacturer ID, name and address, name and ID of parts supplied, quantity supplied, shipping date, remaining stock, ID, name and category of the supplier need to be captured.

Add and manage transaction details

Suppliers would be receiving the order from manufacturers and supplying the parts accordingly.

For that the company needs to add essential transaction details between them and manufacturers. An invoice with transaction ID, transaction date, amount, part name, part ID, quantity, etc.

Manufacturer(ie. Accelero motors) produce some parts of the cars like frames, chassis, etc.

These parts and the parts supplied by the supplier get assembled into the assemble unit and then the assembled car goes into the paint booth.

Then the car inspection tests like road tests, quality tests, dyno tests etc are done so the car can be sent to the dealer.

Following are the use cases regarding to dealers:

1. Add details of the order placed from suppliers
2. Add and manage details of the manufacturer
3. Add and manage details of the assembly plant
4. Add and manage details of the tests that the car has to go through
5. Add new car models to the database
6. Add and manage production scheduling and capabilities
7. Manage shipment to dealers.

Add details of the order placed from supplier

When manufacturers place the order, details like supplier ID, type and name, part ID and name, date of placing the order, quantity, other invoice details, date of receiving the order need to be captured.

Add and manage details of the manufacturer

The frame or chassis of a car provides support and holds all the major components of the car which are produced by its own manufacturing unit. So, the company needs to provide details about their own production and other materials for manufacturing, supplied by the supplier.

It includes ID, name, address ,type of the supplier, manufactured part name, manufactured part ID etc.

Add and manage details of the assembly plant

In the assembly plant, the engine, transmission, suspension, body panels, and electrical systems and all the other parts of the car are installed and assembled.

In the database, details like ID and name of manufactured parts (frame, chassis), ID and name of supplied parts that are sent to the assembly plant, car model names which are under the assembling process need to be captured.

Add and manage details of the tests that the car has to go through

The assembled car then has to go through tests and inspection before it can be sold. The cars which passed the tests then get sent to the dealer.

For these test details, required data like test ID, test-name (road, quality, etc.), test-result(pass/fail), model ID, model name, etc is the data associated.

Add new car models to the database

The car manufactured then must be inserted into the database to keep a record of the car. The model, warranty and other such characteristics of the car are important features to be included.

The details such as model name, model number, making price, manufacture year, color, mileage, warranty, etc are required.

Add and manage production scheduling and capabilities

Managing production is a crucial part of this database. The required details for that are as follows: production starting date, ending date, production capacity per year, stock availability in warehouse etc.

Manage shipment to dealers

The shipment of manufacturers involves the transportation of assembled cars from manufacturing facilities to dealerships. Maintaining a smooth flow of commodities throughout the supply chain requires effective shipment management.

For this, the data associated will be dealer ID, assembler ID, model ID, model-name, shipping-address, quantity, base-price, etc.

Dealers procure cars directly from the manufacturer and sell it to the customers.

Following are the use cases regarding to dealers:

1. Dealer Registration
2. Placed orders for cars from manufacturers
3. Add new car models to the inventory
4. Track sales transactions with customers

Dealer Registration

The company should register the dealers to the database before acquiring a dealership for the cars and selling them to the customers. Details like name, address, contact number, mail id, etc. are to be obtained from the dealers.

Place orders for cars from manufacturers

When the dealer places an order to the manufacturer, the company needs to add the details of the manufacturer like manufacturer ID and of the car like model ID, model name, quantity, price, etc.

Add car models to the inventory

In this, the dealer provides details about all the cars that are currently present in stock. For these the required database details are model ID, model-name, selling price (including all Taxes + base price + registration Fees), quantity in stock, etc.

Track sales transaction with customers

When the dealer sells the car to the customer, the transaction details between the dealer and customer are entered in the database where the details customer ID, model ID, selling price, qty, etc. are added.

Tentative Queries:

Regarding to suppliers:

1. Find the suppliers who have supplied all types of parts of the car excluding raw materials.
2. Give suppliers details who have supplied parts both as self-produced and outsourced.
3. Find the money earned by a particular supplier.

Regarding to manufacturers:

1. List of all the suppliers who supply parts from out of the country.
2. List out top five top/bottom models of car which got sold most/least in a particular year.

3. Find the total cost to make a particular car model. (cost of all the parts supplied + manufacturer cost + assembly cost + testing cost)
4. Find the car model which is least manufactured.
5. Find the car model which has failed most of the test results.
6. Find the dealer's name who collects the most number of cars from the manufacturer.
7. Find the dealer's name who has not sold any cars yet (new dealer in the market).
8. List dealers who have sold every car model except for a specific one.

Regarding to dealers:

1. Find the state name in which a particular car is sold the most
2. List the warranty of all the car models which were sold in a particular year.
3. Find the total revenue earned by a specific dealer within date range.
4. Find the top 5 customer names who have purchased the most cars from the dealer.
5. Find the customers who have purchased multiple cars of the same model from a particular dealer.