Car Rental Data Management Project

A car rental company (CRC) is considering a new data management system in order to provide quality service to its customers. You are an IFB299 team in charge of the development of this system and your team wants to show a demonstration to the board of CRC to promote the idea you are developing. Assume that your team has obtained some information about CRC (see below), and your team also wants to get some indirect requirements from the board of CRC through the demonstration.

CRC has multiple car rental locations (or stores at, e.g., Brisbane, Melbourne, Sydney, Adelaide, Gold Coast, etc.) around Australia. It offers a wide range of cars, 4WDs and mini buses as well as Australia's largest fleet of truck and commercial vehicles that are distributed in these locations for customers.

Its customers can pick up a car from a store and return the car to another store. When a customer rents a vehicle from CRC or returns a car, CRC hopes to gather the customer's information as follows: *name, contact details, date of birth.*

You also understand that CRC currently has a system, which uses local store database to maintain a central database for recording customer information, their booking and activities (e.g., pick-up or return car).

A customer will be deemed to have returned the vehicle only after the final inspection of it has been conducted by a staff in a store. The store also maintains a local database to record the pick-up or returns, including customer information, order ID, vehicle information, payment, and others that do not shown in the rental agreement (e.g., late of return a car, a different return location, car accident or lost).

In this project, you are assumed to develop an ***interactive data management web application*** for managing the company **history** data for supporting business intelligence. Therefore, you do not need to include online-booking or payment details in the demonstration. However, you should show the compatibility and feasibility of the web application that can be extended with functions for online ordering and payment. This web app will allow for the company to access their database securely and safely in a user-friendly online environment. You are required to use the attached Microsoft Office Excel worksheet "CarRentalDataSource.xlsx" as the source data.

Detail requirements about the database and business logic:

(1) You are required to design and implement a database for recording the history of rental services of CRC's customers (not including the costumers who have ordered or picked up cars but have not returned their rental cars). The database should contain the following kinds of data dimensions: *customer information, car information, store information and time.*

A flat data source can be found in the attached "carRentalDataSource.xlsx" file. You can choose them as your source data. Please note that some data in the file may be noisy or incorrect; so you may need to use a data cleaning method (e.g., simply ignore incomplete data, or replace them by "mean") for building the new database.

(2) The board of CRC expects the system to provide some functions to analysis their customers in order to improve their management and services, for example,
    - The board wants to browse the numbers of different cars that are picked up or returned in some stores (e.g., Brisbane, Gold coast, Sydney) monthly.
    - Car recommendations to customers. The board hopes to provide a new service to customers to help them choosing a car (type) based on customers geography (city) information and time (Month).

    Your team can design and implement other data analysis or report functions that could be helpful to the company to improve their management and services. However, at least three such functions (ideally, two for company management and one for customer services should be included) should be provided by the system.

Detail requirements about frontend web interface for data navigation and display:

(1) The management staff or the data analyst can use the web interface to fetch data from a database and display current context in a proper format (e.g. tabular format with drop-down-lists). The interface may also provide some functional buttons with some simple query input to display the analysis results generated by specified data analysis or report functions which the system provide. For the data analysis results display, the user will be able to specify how to represent the results, e.g., ordering by different dimension, or using filters.

    The web interface should have an access control system, e.g. log in with user name and password for company users.

(2) The customer can also have an access to the web interface, which allow them to view all the cars available to rent (including car information and their current location via database connection) even without logging in, as well as use the functions which are designed for their usage (e.g. above mentioned car recommendations service).

Besides above basic requirements, your team can design and implement other functions or features for the web application, such as results virtualisation, reporting system, session management, role-based authentication. However, your team will be only awarded for the working functions or features you delivered.