Flinders University
2023 S2 COMP8711
Database Modelling and Information Management

Assignment 3

Additional business scenarios

1.Maintenance and Repair Services (Entity: Maintenance):

Introduce vehicle maintenance and repair services for Utes and other vehicles in the company, and expand its service scope. "Tradie mates" should hire highly skilled mechanics and technicians to ensure that the vehicle is in excellent condition and take customer satisfaction to the next level. This new business could expand to other social vehicles, opening up another revenue stream. For example, local businesses and social individual Ute owners can leverage these maintenance and repair services to turn "tradie mates" into super-service stations for Ute-related needs.

2.Customer Loyalty Programs and Membership (Entity: Loyalty_Program):

Develop a loyalty program to drive customer satisfaction and repeat business. Through this program, customers earn membership points every time they come to rent and spend, which can be redeemed for discounted rentals or gift cards, among other prizes. In addition, "Exclusive Members" can offer membership packages that provide exclusive benefits to exclusive members, such as priority lock-in bookings, premium discounts, and fixed personal consultant services. These new ventures can not only increase customer loyalty, but also generate significant additional revenue through membership fees.

3.E-commerce Platform for Vehicle Accessories (Entity: E-commerce):

Launch an E-commerce platform to sell Ute accessories and tools using existing cloud service plans. The platform can offer a large number of Ute related goods, from car supplies and safety supplies to Ute custom accessories. By meeting the various needs of social personnel and leasing customers, this e-commerce platform can serve as an auxiliary to the core leasing business and make breakthroughs in the company's performance. In addition, it can also be used as a marketing tool to attract more potential customers on the website to rent the vehicle.

Entity-Relationship Diagram
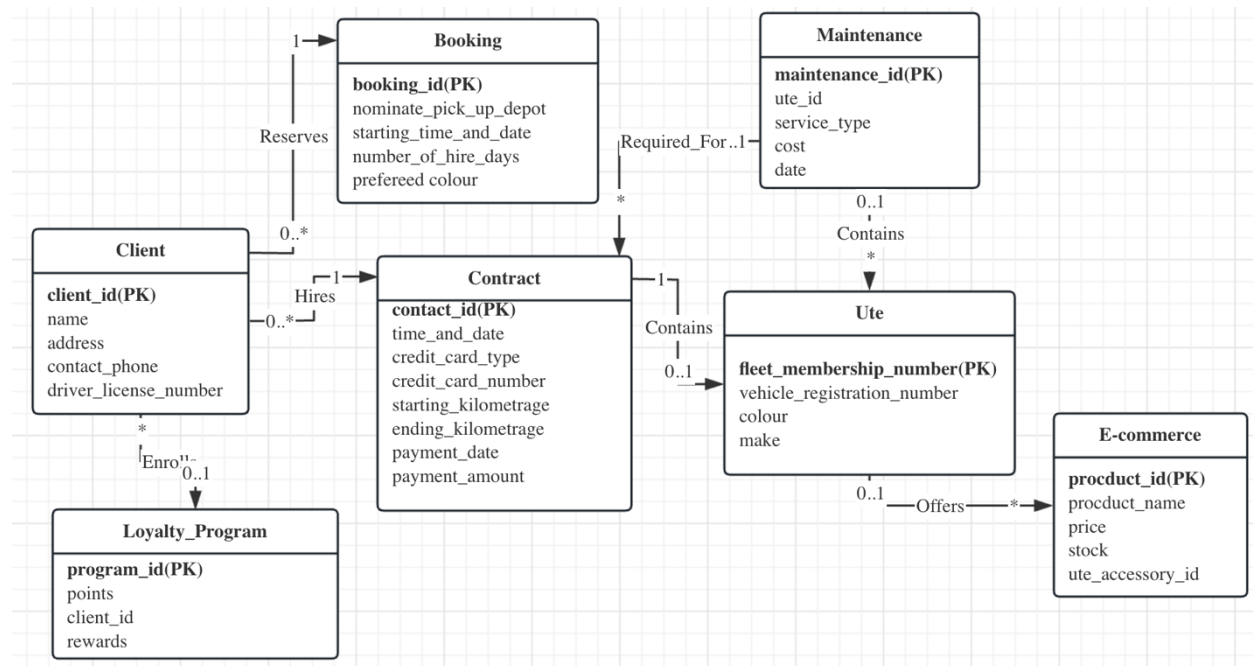
logical model representation

Maintenance (maintenance_id, service_type, date, cost, ute_id)
Primary Key: maintenance_id
Foreign Key: ute_id references Ute(fleet_membership_number) ON UPDATE CASCADE ON DELETE NO ACTION

Maintenance is a strong entity that captures all the details regarding the services provided to a particular Ute. The attribute ute_id has been posted into the Maintenance relation from a 1:* Serviced relationship where Maintenance was the child and Ute was the parent. ute_id is NOT NULL as Maintenance has mandatory participation in the Serviced relationship. ON UPDATE CASCADE ensures that if a Ute's fleet_number changes, all related maintenance records are updated accordingly. DELETE NO ACTION ensures that a Ute cannot be deleted without first updating or deleting its related maintenance records.

Loyalty Program (program_id, client_id, points, rewards)
Primary Key: program_id
Foreign Key: client_id references Client(client_id) ON UPDATE CASCADE ON DELETE NO ACTION

Loyalty Program is a strong entity that encapsulates the loyalty details of a client. The attribute client_id is the foreign key connecting the Client and Loyalty Program. It ensures that each program entry is associated with a valid client. The relationship between Client and Loyalty Program is many-to-one, with mandatory participation from the Loyalty Program side. The choice of ON UPDATE CASCADE ensures that if a client's number changes, all related loyalty program entries are updated. DELETE NO ACTION prevents the deletion of a client without addressing the associated loyalty program records.

E-commerce (product_id, product_name, price, ute_accessory_id, stock)
Primary Key: product_id
Foreign Key: ute_accessory_id references Ute(fleet_membership_number) ON UPDATE CASCADE ON DELETE SET NULL

Reasoning: The E-commerce entity encapsulates the products offered online, some of which may be Ute accessories. The attribute ute_accessory_id establishes a connection between a product and a specific Ute, suggesting compatibility. This relationship is not mandatory, allowing for products unrelated to Utes. Hence, it is set to allow NULL values. ON UPDATE CASCADE ensures that changes to Ute fleet numbers are reflected in related product listings. ON DELETE SET NULL means that if a specific Ute is deleted, the associated product entries will not be deleted but will have their ute_accessory_id set to NULL.