**IS2103 Enterprise Systems Server-side Design and Development**

**PAIR PROJECT**

****

**Pair Group: PP01**

**Merlion Car Rental (MCR) System Write-up**

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# **Executive Summary**

## Components in solution

## Benefits of solution

## Process taken

# **Introduction**

## Project Scope

## Subsystem/Modules in Solution

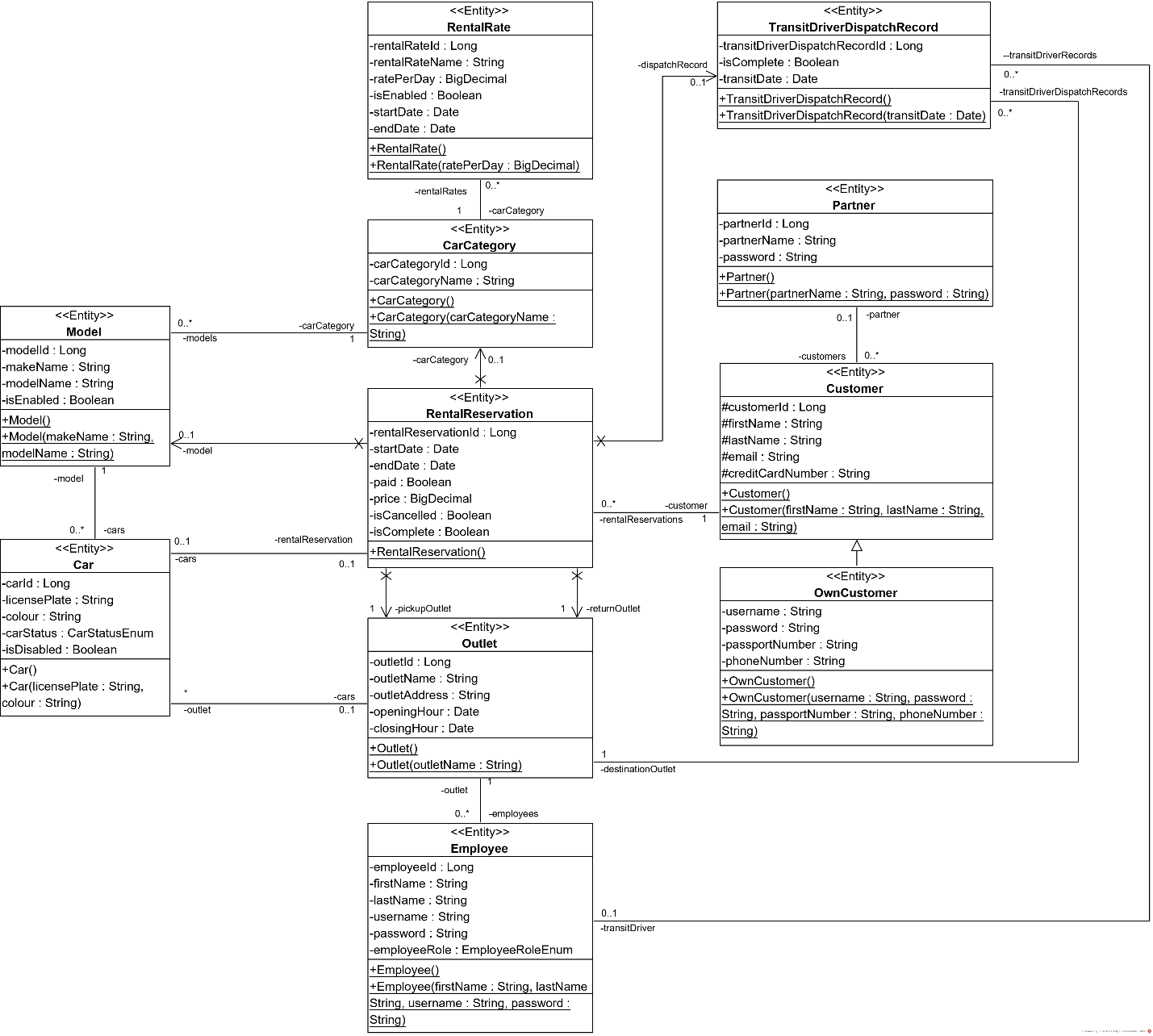
### CaRMS Management System

### CaRMS Reservation System

### Holiday Reservation System

# **High-level Systems Architecture**

# Logical Data Model



# Physical Data Model

# **Business Requirements Analysis**

## CaRMS Management System

### Rationale

### Rules & Assumptions

|  |  |  |  |
| --- | --- | --- | --- |
| **S/N** | **Use Case** | **Business Rules** | **Business Assumptions** |
| 1 | Create New Outlet | * Backend data initialisation only. * Create a new outlet record. * Basic attributes should include address and opening hours. |  |
| 2 | Create New Employee | * Backend data initialisation only. * Create a new employee record with the required credentials, user role (corresponds to use case actor) and outlet. |  |
| 3 | Create New Partner | * Backend data initialisation only. * Create a new partner record. |  |
| 4 | Create New Category | * Backend data initialisation only. * Creates a new (car) category record. |  |
| 5 | Allocate Cars to Current Day Reservations | * Retrieve a list of all car rental reservations for pickup on the current date and allocate an available car for the reserved car (make and) model or category. * When allocating cars, priority should be accorded to cars that are already in the pickup outlet or will be returned to the pickup outlet in time. * Cars that are at a different outlet from the pickup outlet should be allocated only when necessary. | Assumes that allocation is done at 2AM daily |
| 6 | Generate Transit Driver  Dispatch Records for  Current Day Reservations | * Retrieve a list of car allocations for pickup on the current date that require movement from another different outlet. * Generate a transit driver dispatch record for each car. * Each outlet should only manage dispatch records for cars that are to be moved to itself. | Assumes that transit can still be done outside of the outlet’s operating hours |
| 7 | Employee Login | * Allows an employee to login to the system and assume the preconfigured user role. * May only be performed if employee is not currently login to the system. * Employee must be currently login to the system to perform all other use cases. * A default system administrator account should be created as part of data initialisation. |  |
| 8 | Employee Logout | * Logout the employee. * May only be performed if employee is currently login to the system. |  |
| 9 | Create Rental Rate | * Create a new car rental rate record for a particular car category. * Basic attributes should include name, car category, rate per day (i.e., 24 hours period), validity period (if applicable). * No rental reservation can be made if a rental rate is not available for a particular category for a particular day. |  |
| 10 | View All Rental Rates | * Display a list of all car rental rate records in the system. * Records should be sorted in ascending order by car category and validity period. |  |

## CaRMS Reservation System

### Rationale

### Rules & Assumptions

|  |  |  |  |
| --- | --- | --- | --- |
| **S/N** | **Use Case** | **Business Rules** | **Business Assumptions** |
| 11 | View Rental Rate Details | * View the details of a particular car rental rate record rental rate record. |  |
| 12 | Update Rental Rate | * Update the details of a particular car rental rate record |  |
| 13 | Delete Rental Rate | * Delete a particular car rental rate record. * A rental rate record can only be deleted if it is not used. * Otherwise, it should be marked as disabled and new reservation should not be made with the disabled rental rate. |  |
| 14 | Create New Model | * Create a new (make and) model record for a particular car category. * Basic attributes should include make and model. |  |
| 15 | View All Models | * Display a list of all (make and) model records in the system. * Records should be sorted in ascending order by car category, make and model. |  |
| 16 | Update Model | * Update the details of a particular (make and) model record (make and) model record |  |
| 17 | Delete Model | * Delete a particular (make and) model record. * A (make and) model record can only be deleted if it is not used. * Otherwise, it should be marked as disabled and new car record should not be created with the disabled (make and) model. |  |
| 18 | Create New Car | * Create a new car record for a particular (make and) model. * Basic attribute should include license plate number, colour, status (in outlet or on rental) and location (specific customer or outlet). |  |
| 19 | View All Cars | * Display a list of all car records in the system. * Records should be sorted in ascending order by car category, make, model and license plate number. |  |
| 20 | View Car Details | * View the details of a particular car record. |  |
| 21 | Update Car | * Update the details of a particular car record. |  |
| 22 | Delete Car | * Delete a particular car record. * A car record can only be deleted if it is not used. * Otherwise, it should be marked as disabled and cannot be rented out. |  |
| 23 | View Transit Driver  Dispatch Records for  Current Day Reservations | • Retrieve a list of all transit driver dispatch records for the current day for the current outlet. |  |
| 24 | Assign Transit Driver | * Assign a driver to a particular transit driver dispatch record for the current day for the current outlet. * The driver may be any employee that is working in the current outlet. |  |
| 25 | Update Transit As Completed | • Update a particular transit driver dispatch record for the current day for the current outlet as completed after the transit driver has returned to the outlet with the car. |  |
| 26 | Pickup Car | * Record a customer picking up a car. * If rental fee payment is deferred during online reservation, it must be paid before the car can be collected. * Status and location of the car must be updated. |  |
| 27 | Return Car | * Record a customer returning a car. * Status and location of the car must be updated. |  |

## Holiday Reservation System

### Rationale

### Rules & Assumptions

|  |  |  |  |
| --- | --- | --- | --- |
| **S/N** | **Use Case** | **Business Rules** | **Business Assumptions** |
| 1 | Register As Customer | * Allows a visitor to register as a customer of MCR. * Each customer must be uniquely identifiable, e.g., email, mobile phone number or passport number. |  |
| 2 | Customer Login | * Allows a customer to login to the system. * May only be performed if customer is not currently login to the system. * Customer must be currently login to the system to perform reservation-related use cases. |  |
| 3 | Search Car | * Search an available car across all category and (make and) model offered by MCR according to the pickup date/time, pickup outlet, return date/time and return outlet. * The rental fee amount should be calculated based on the available prevailing rental rate of that particular category. * The system needs to ensure that MCR has sufficient car inventory to fulfil the new reservation, including transiting cars between outlets in order to prevent overselling while maximising revenue. | Searches the number of rental reservations for the car category or model in with overlapping time periods.  If the number of cars is greater than the number of reservations, the user is able to reserve a car. |
| 4 | Reserve Car | * Reserve a car offered in the search results (see use case 3). * You may assume that a customer can only reserve one car per transaction. * Record the credit card details of the customer for handling immediate or deferred rental fee payment. |  |
| 5 | Cancel Reservation | * Cancel a particular car rental reservation. * If the rental fee has already been paid, refund the balance after deducting the cancellation penalty amount. * If the rental fee has not been paid, charge the customer’s credit card for the penalty amount. |  |
| 6 | View Reservation Details | * Display the details of a particular car rental reservation. |  |
| 7 | View All My Reservations | * Display a list of car rental reservation records for the customer. |  |
| 8 | Customer Logout | * Logout the customer. |  |