**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. |  |
| 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. |  |
| 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. |  |
| 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. |  |