BACS2053 Object-Oriented Analysis and Design

Practical Assignment: Case Study

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| **Assignment Overview** | For this assignment, you will be analysing a business scenario to identify the users’ requirements. You will derive and create UML analysis models for the newly proposed a **Taxi Management System (TMS).**  The analysis models will be used to facilitate the construction of the design models for the new system by using IBM Rational Software Architect (RSA). |
| **Learning Outcomes Being Assessed** | * Analyse a given business scenario and identify the users’ requirements. * Derive the Unified Modelling Language analysis models for the new system based on the users’ requirements. * Construct the Unified Modelling Language design models for the new system. * Use the UML modelling software IBM Rational Software Architect to construct the diagrams. * Critically evaluate the proposed design decisions and the overall process for completing the assignment. |
| **Submission Deadlines** | **Presentation: Week 13 and Week 14**  **Portfolio Part 1: Week 8 – 18 July 2016 before 12:00pm**  **Portfolio Part 2: Week 12– 19 August 2016 before 12:00pm**  Late submission will be capped to 50% (unless a concrete reason is provided). |
| **Team Organization** | **This is a group assignment. Students are to work in teams of 4 members.**  If the number of students in the tutorial group is not a multiple of 4, then the tutor should make the decision for the grouping.  Even though this is a team assignment, each team member should participate in preparing every deliverable required in the assignment and the marks will be given base on each individual contribution. |
| **Detail Question** | **Source: http://www.ezcab.com.my/**  **Company and Project Background**  EzCab Sdn Bhd currently works in partnership with a few of Taxi Company to provide a reliable public transport in Klang Valley and Kuala Lumpur area.  Currently, the daily activities of the EzCab Sdn Bhdareusing manual transactions such as manual recording and phone calling. The procedures are not comprehensive and usually are departmentalized and not integrated.  Therefore, the top management has decided to develop an Online TaxiManagement System to solve the problems that currently faced. EzCab provides a free taxi-booking app for smartphone users that allow users to book taxi at anywhere anytime (24x7). With just a few clicks, userscan save the hassle of calling up hotlines and make a safe journey and reliable services.  Your team has been commissioned to develop anonline **Taxi Management System (TMS)**for EzCab Sdn Bhd.As a project manager, you plan to propose the following modules:  **Driver Maintenance Module**   * This module enables the HR manager to maintain drivers’ records by adding, updating and searching information. * The drivers’ informationshould includedriver ID, name, identity card number, Taxi Company, expired driving license, contact number, and etc.   **Registration Module**   * For the first time customer, registration is required. A customer should provide his or her contact number, name, address either using EzCab app or online registration. Account will be created with user login details such as username and password. * For non-first time customer, he or she can login in to the EzCab app or website to update his or her personal contact details such as contact number, address,and etc.   **Booking or Reservation Module**   * This module allows customersto book taxiwith smartphone.Customer is required tomake booking 2 hours in advance. During the booking process, customer is required to provide the date, time, pick up address, destination, and etc. Then the system will display the available taxi for customer to make the selection. * Once the booking transaction is done, the system will redirect the customer to payment form. The payment form will show the estimated charges, and the customer is required to make payment to complete the booking process. * Customer can view his or her past booking history, save the favourite location for future reference, etc.   **Notification bySMS Module**   * This module will sendnotification to the customer smartphone 15 minutes (by default) before the taxi arrives at the customer pick up address. Besides, the system also able to send the latest promotions / package details to the customers.   **Pick Up (route map) Module**   * This module will keep track the departure/arrival time of the driver for sending the customer to the destination. Driver is required to update the journey status when reached the destination. * Besides, the route map will show the latest traffic condition to the drivers as reference.   **EPayment Module**   * This module will handle the payment transactions via online. Once the payment transaction is done, the system should be able to generate an online receipt (as proof for online payment) to the customers. * After the payment is completed, EzCab app or website display the taxi information such as taxi plate number, driver’s name and estimated waiting time.   **Generate Reports**   * This module will generate various typesof reports such as daily or monthly transaction reports(booking schedule list,etc), exception reports (i.e. reservation cancellation), and summary reports (i.e. yearly sales reports)   **Outline of Problem**  This assignment consists of 2 parts. Your team is required to maintain an assignment portfolio for each part. This portfolio should contain your weekly deliverables shown to your tutor and be organized by week number.  **Part 1**  Carry out requirements analysis of TaxiManagement System (TMS).  **You may make appropriate assumptions for this case study.**  **At the end of Week 8, your team is required to submit**   * A hardcopy report which includes the following items: * A cover page (use the template provided). * A contents page& sign declaration. * Identify the problems faced for the current system * A functional requirements list of the proposed system. * Use case diagramsfor the proposed system consisting of:   1. An overview use case diagram   2. \*\*Detail use case diagrams   3. \*\*Use case descriptions for every use case scenario * \*\*Activity diagram based on the detail use case diagrams * Analysis class diagram without generalization, data types and operations * State any assumptions necessary.   \*\*Each team member should produceONE(1)details use case diagram plus the scenarios for that use case (if applicable), use case description(s) for that use case’s scenarios and activity diagram(s) for that use case’s scenarios. Hence, the number of use cases produced by each team should correspond to the number of members in the team.   * A softcopy of your RSA models and assignment report in CD-R / DVD-R. * Assignment portfolio for Part 1.   **Part 2**  Based on your requirements analysis from Part 1, prepare the design models for your proposed Taxi Management System.  **At the end of Week 12, your team is required to submit**   * A hardcopy report which includes the following items: * A cover page (use the template provided). * A contents page& sign declaration * \*\*Design sequence & collaboration diagrams for each use case scenario. * State chart diagrams for the relevant problem domain (entity) classes. * Final class diagram with generalization, data types and relevant operations. * Package diagram (i.e. network diagram) illustrating the software design using model-view-controller (MVC) 3-tier architecture for the HIS. * Deployment diagram for the new system architecture.   \*\* Each team member should produce this diagram(s) for a specific use case (i.e. the use cases assigned to different members should not be duplicated).   * A softcopy of your software models and assignment report in CD-R or DVD-R. * Assignment portfolio for Part 2. * Anindividual report by each individual team member, critically evaluating the proposed design decisions and the overall process for completing the assignment.   Note: For Part 1 and Part 2,   * You are required to **use Rational Software Architect (RSA)** for the **UML diagrams.** * In your report, ensure that all diagrams are properly labelled with a figure number and title. All diagrams must be explicitly referenced in either the functional requirements list or written descriptions.   Important Reminder  This is yourassignment. You are not allowed to refer to your peers’ work (except for those in your team). Students found to be dishonest are liable to disciplinary action (see Academic Impropriety). |
| **Weekly ClassDeliverables Schedule** | **Part 1**   |  |  | | --- | --- | | **Week** | **Deliverables** | | 2 | Identify the problems faces by the current system  A functional requirements list of the new system. | | 3-4 | An overview use case diagram and detail use case diagrams for the new system. | | 5 | Use case descriptions for each use case / scenario. | | 6 | Activity diagrams for use cases / scenarios. | | 7 | An initial class diagram of the problem domain (entity) classes with attributes and associations (no data types and inheritance required). | | 8 | **Deadline**: Submission of Assignment Part 1’s hardcopy report, softcopy models / report and assignment portfolio. |   **Part 2**   |  |  | | --- | --- | | **Week** | **Deliverables** | | 8 | 1. Design sequence diagrams for use case scenarios\*\*. 2. Design collaboration diagrams for use case scenarios\*\*.   \*\*Note: For each scenario, produce **bothtypes** of design interaction diagram for each member. | | 9 | State chart diagrams for any **TWO** relevant problem domain classes. | | 10 | 1. Final or design class diagram with generalization, relevant data types and class operations. 2. Package diagram (i.e. network diagram) which illustrates the software design using model-view-controller (MVC) 3-tier architecture for the **Taxi Management System.**   (Note: Partition it into subsystems using presentation, business logic and database three-layer architecture). | | 11 | 1. Deployments diagram for the TMSarchitecture. | | 12 | **Deadline**: Submission of Assignment Part 2’s hardcopy report, softcopy models / report and assignment portfolio. | | 13 | Presentation by teams | | 14 | Presentation by teams (continued) | |
| **Guidelines** | Your assignment submission should adhere to the following guidelines.   |  |  | | --- | --- | | Paper size | A4 (Use only one side of the paper) | | Line spacing | 1 line | | Font size | 11 pt for written descriptions | |
| **Estimated NonF2F Hours Required** | Part 1: At least 5 hours per team member.  Part 2: At least 10 hoursper team member. |
| **Academic Impropriety** | You may only work with the students in your team to produce your answer.  Your attention is drawn to the School of Arts and Science Handbook and the College Guidelines on Avoiding Plagiarism.This covers cheating, attempt to cheat, plagiarism, collusion and any other attempts to gain an unfair advantage in assessment.  **The work you submit must conform to these regulations.** |
| **Assessment** | This assignment contributes 60% to the overall coursework mark for the course. The assessment criteria is provided below (refer to the rubrics for details):   |  |  | | --- | --- | | **Assessment Criteria** | **Marks Allotted** | | **Part 1** | | | 1. Problem statement and Functional requirements list | 4 | | 1. Correctness and completeness of overview use case diagram | 4 | | 1. \*\*\*Correctness and completeness of details use case diagrams + use case descriptions **(Individual assessment)** | 8 | | 1. \*\*\*Correctness and completeness of activity diagrams based on the use case scenarios **(Individual assessment)** | 4 | | 1. Correctness and completeness of initial/ analysis class diagram | 4 | | **Subtotal Marks** | **24** | |  | | | **Part 2** | | | 1. Correctness and completeness of state chart diagram(s) for any TWO problem domain classes | 4 | | 1. \*\*\*Correctness and completeness of interaction diagrams **(Individual assessment)** | 8 | | 1. Correctness and completeness of final class diagram. | 4 | | 1. Correctness and completeness of deployment diagram | 4 | | 1. Correctness and completeness of package diagram | 4 | | **Subtotal Marks** | **24** | | 1. Team Work | 4 | | 1. \*\*\*Project management (weekly deliverables for entire assignment) | 4 | | 1. \*\*\*Individual presentation(Part 1 & 2) | 4 | | **Subtotal Marks** | **12** | | **Total marks for Practical Assignment** | **60** |   \*\*\*Individual marks will be awarded to each student.  Note   * For each part, failure to adhere to the required requirements for submission and report presentationwill result in being downgraded a grade. * From the total marks obtained for the overall practical assignment,   *Marks per team member = Total marks x % contribution* |

TunkuAbdulRahman University College

**BACS 2053**

**Object-Oriented Analysis and Design**

**Assignment (May 2016)**

**Part 1**

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| Programme | : | **R** |
| Tutorial Group | : |  |
| Tutor Name | : |  |
| Date Submitted | : |  |

**Declaration**

**We confirm that we have read and shall comply with all the terms and conditions of TAR University College’s plagiarism policy.**

**We declare that this assignment is free from all forms of plagiarism and for all intents and purposes is my own properly derived work.**

**Team Members:**

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|  | | **Assessment Criteria (Part 1)** | | | | | | |
| Student Name | Signature | PS/FR4% | OUCD 4% | DUCD 8% | AD  4% | ACD 4% | Total | Comments |
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**PS/FR – Problem Statement / Functional Requirements**

**OUCD – Overview Use Case Diagram**

**DUCD – Details Use Case Diagram and Use Case Descriptions**

**AD – Activity Diagram**

**ACD – Analysis Class Diagram**

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**Assignment (May 2016)**

**Part 2**

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| --- | --- | --- |
| Programme | : | **R** |
| Tutorial Group | : |  |
| Tutor Name | : |  |
| Date Submitted | : |  |

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**Team Members:**

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|  | | **Assessment Criteria (Part 2)** | | | | | | | |
| Student Name | Signature | ID- 8% | SD- 4% | FCD- 4% | DD-4% | PD- 4% | Project management – 8% | Presentation – 4% | Total |
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| Comments: | | | | | | | | | |

ID - Interaction Diagrams DD - Deployment Diagram

SD - State Diagram PD - Package Diagram

FCD - Final Class Diagram