



## ICT UNIVERSITY FALL 2022 SEMESTER UNDERGRADUATE CONTINUOUS ASSESSEMENT

**Course Code & Title:** SE 3112 – Software Architecture Test

**Instructions:** Answer all questions

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### **CASE STUDY A (AutoCab - A Self Drive Taxi Company)**

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AutoCab is a traditional business company where Taxis can be booked by calling call center. The company wants to expand her business to a self-driving Taxi system. The company wants booking of the self-driving taxi (when launched) to be done via AutoCab web or mobile application. The self-driving taxi will confirm the trip, will pick up the customer at his/her desired location. Once the trip is finished, customer will pay online and the trip is considered completed and the self-taxi is ready for the next pick up.

#### **Requirements**

AutoCab expects the application to be up 24/7.

Self-driving Taxi is going to generate loads of data, and these data need to be analyzed for performance, engine health by a data team.

The application should be able to handle millions of customers

All the transactions need to be secured and should be audited.

#### **Additional info.**

AutoCab wants to launch the application first in Yaoundé and she has a plan to expand to the rest of Cameroun by the end of the year.

Support push capabilities of messages and updates to customer application and self-driving taxi by the Admin

The user interface of the application should be straight forward and not difficult to use

The payment is using existing payment gateway system

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1. Identify four (4) Quality Attributes from the CASE STUDY A and justify you selections. **(12 marks)**
2. Rank the quality attributes identified from the CASE STUDY A using the users of AutoCab view/perspective. **(4 marks)**
3. What Architecture type do you recommend for implementation? Justify with reasons **(4 marks)**
4. Model the Context Diagram of the above CASE STUDY A in UML and briefly explain **(10 marks)**
5. Model the component Diagram of the above CASE STUDY A in UML using the ball and socket/lollipop variation. **(10 marks)**
6. Transform the ball and socket component diagram to use the dependencies variation notation **(10 marks)**
7. If data analyst want to be able to have access to the data generated from the AutoCab self-driving Taxi for analysis. The data analyst should be authenticated by the directory service, analysis service and business service before having access to the reports generated from the database. Model the sequence diagram for the process. **(10 marks)**

**NOTE:** 1. State the software used in your design

2. Show screenshots of your design in your documentation

3. Include as attachment a zipped file of your designs in your submission.

**Submission of Work Date: On or before 25<sup>th</sup> January, 2023**