National University of Computer and Emerging Sciences

Introduction to Software Engineering (SE1001)

Date: February 28th 2024
Course Instructor
Ms. Iqra Fahad

Sessional-I Exam

Total Time: 1 Hour
Total Marks: 30
Total Questions: 3

Semester: SP-2024
Campus: Karachi
Dept: Software Engineering

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Student Name   Roll No   Section   Student Signature

SOLUTION

CLO 1: Apply suitable process models and activities for medium size software systems
Question 01

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a) A software development team is working on a project for a client who has a strict budget and timeline. The client needs the software to be delivered within a specific timeframe and has limited resources. Which software process model would you recommend for this project and why?
                                                                                                    [5 marks]

Given the strict budget, timeline, and limited resources, Agile would be the recommended software process model. Its iterative approach, flexibility in adapting to changes, frequent communication, and risk management capabilities make it well-suited for delivering value incrementally within such constraints.

b) Imagine that a government wants a software program that helps to keep track of the utilization of the country's vast mineral resources. Although the requirements put forward by the government were not very clear, a software company was tasked with the development of a prototype. The government found the prototype impressive, and asked it be extended to be the actual system that would be used. Discuss the pros and cons (at least 3) of taking this approach.
                                                                                                    [5 marks]

Pros:

  1. *Quick validation of concept and alignment with government's needs.*

2. *Cost savings due to leveraging existing prototype.*
3. *Incremental improvement based on user feedback.*

Cons:

1. *Accumulation of technical debt.*
2. *Risk of incomplete functionality due to unclear requirements.*
3. *Potential scalability and performance challenges.*

c) Write a User Story for "viewing order history" of an online shopping website. **[3 marks]**

*As a frequent shopper on the online platform, **I want to** easily access my order history **so that** I can track my past purchases and review details such as order dates, items purchased, and order statuses for reference and record-keeping purposes.*

d) What is the recommended duration for Daily Scrum meeting? What is the motive for conducting this meeting? **[4 marks]**

The recommended duration for a Daily Scrum meeting is typically 15 minutes. The motive for conducting this meeting is to provide the development team with a brief opportunity to synchronize their activities, discuss progress, identify potential obstacles, and plan their work for the day. It's a key component of Agile methodologies like Scrum, fostering collaboration, transparency, and adaptability within the team.

CLO 2: Analyze software requirements and how to produce software design and architecture
Question 02

Discover ambiguities or omissions in the following statement of the requirements for part of a drone system intended for search and recovery, enlist all ambiguities and re-write the requirement statement: **[6 marks]**

"The drone, a quad chopper, will be very useful in search and recovery operations, especially in remote areas or in extreme weather conditions. It will click high-resolution images. It will fly according to a path pre-set by a ground operator, but will be able to avoid obstacles on its own, returning to its original path whenever possible. The drone will also be able to identify various objects and match them to the target it is looking for."

Ambiguities and omissions in the requirement statement:

1. ***Clarity on High-Resolution Images***: *The term "high-resolution images" is subjective and lacks specific parameters such as resolution specifications or image quality standards.*
2. ***Path Pre-Set by Ground Operator***: *It's unclear how the path is set by the ground operator. Is it through manual input, GPS coordinates, or another method?*

3. **Obstacle Avoidance Mechanism**: *The statement mentions that the drone will avoid obstacles on its own but does not specify the mechanism or sensors used for obstacle detection and avoidance.*
4. **Return to Original Path**: *It's ambiguous what "returning to its original path whenever possible" entails. Does it mean the drone will automatically re-route around obstacles or wait for the obstacle to clear?*
5. **Object Identification**: *While it's mentioned that the drone will be able to identify various objects, the requirement lacks details on the specific objects it can identify and how it matches them to the target.*
6. **Target Identification Criteria**: *The requirement doesn't specify the criteria for target identification, such as size, shape, color, or other distinguishing features.*

Revised Requirement Statement:

"The quad chopper drone, intended for search and recovery operations in remote areas or extreme weather conditions, shall capture images meeting defined high-resolution specifications. The drone will follow a predefined path set by the ground operator using GPS coordinates. It shall employ obstacle detection sensors and algorithms to autonomously avoid obstacles, adjusting its path as necessary. If obstacles are encountered, the drone shall prioritize re-routing while adhering to safety protocols. Additionally, the drone shall possess object recognition capabilities, identifying predefined target objects based on specified criteria such as size, shape, and color."

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CLO 4: Discuss key principles and common methods for software project management such as scheduling, size estimation, cost estimation and risk analysis
Question 03

Create WBS of the following: **[7 marks]**

After much deliberation and watching people wait silently and suffer, the company was founded in 2021 to provide a solution whereby one could track designated rides while they were on the way and avoid the physical and mental discomfort of waiting on the road for the ride to arrive. EaseTravel app is a trip tracking service for daily commuters and essentially to be used for people using hired transport services for daily intra-city traveling.

This application has two main users: the driver and the daily commuter.

After analysis some findings conclude that most of the Vehicle drivers are novice users and reluctant to embrace any technology so, the developing company must create user-interface accordingly. Onboard screen has all the basic features needed to fulfill the objectives of user. Such as, log-in, forget & setting new-password after verification user will get into the application to make vehicle selection, this option only appears one-time for drivers who have multiple vehicles assigned to them. They can change the vehicle anytime; the home screen displays the vehicle selected. To be clicked when you need to change the vehicle, starting a journey, The APP automatically marks Arrived when the driver

reaches a stop. Attendance automatically opens with all travelers marked present, only need to mark Absentee, pop-up: ride complete, making calls Occasional - When needed.

Same goes for the daily commuter until login, afterwards the home screen displays the passenger selected. To be clicked when need to change the passenger. (In case of multiple passengers associated with an account), tracking services will be available to ensure the safety. On reaching the destination the screen will pop with a successful ride! message. There are some complementary features like: previous ride history and delay and cancellation of ride, passenger no-show notification as well.

1. *User Interface Development*
   - *1.1 Completed User Interface Design*
   - *1.2 Implemented User Interface*
   - *1.3 Tested User Interface*
2. *Driver Features*
   - *2.1 Functional Log-in and Authentication*
   - *2.2 Vehicle Selection Feature Developed*
   - *2.3 Journey Start/End Feature Implemented*
   - *2.4 Arrived Status Update Functionality Added*
   - *2.5 Attendance Management System Integrated*
   - *2.6 Making Calls Feature Implemented (Occasional)*
   - *2.7 User Interface for Novice Drivers Developed*
3. *Commuter Features*
   - *3.1 Functional Log-in and Authentication*
   - *3.2 Passenger Selection Feature Developed*
   - *3.3 Tracking Services Integrated*
   - *3.4 Successful Ride Notification Feature Implemented*
   - *3.5 User Interface for Daily Commuters Developed*
4. *Tracking Services*
   - *4.1 Tracking Mechanism Designed*
   - *4.2 Tracking Services Implemented*
   - *4.3 Tracking Services Tested*
5. *Additional Features*
   - *5.1 Previous Ride History Feature Added*
   - *5.2 Delay and Cancellation Notification Feature Implemented*
   - *5.3 Passenger No-show Notification Feature Developed*
6. *Quality Assurance*
   - *6.1 Testing and Quality Assurance Completed*
   - *6.2 Bugs Fixed and Issues Resolved*
7. *Documentation and Training*
   - *7.1 User Manual Prepared*
   - *7.2 Training Materials Developed*
   - *7.3 Documentation Reviewed and Updated*
8. *Deployment and Support*
   - *8.1 Application Deployed*

- *8.2 User Support Provided*
- *8.3 Monitoring and Maintenance Ensured*

9. **Integration**
   - *9.1 Driver and Commuter Modules Integrated*
   - *9.2 Integration with Tracking Services Completed*
   - *9.3 Integration with Additional Features Achieved*