

Dr. Babasaheb Ambedkar Technological University, Lonere

Master of Technology (Computer Engineering and Allied Branches)

Course: Software Architecture (MTCE1202)

Summer Semester Examination, May 2018

Maximum Marks: 60

Duration: 3 Hours

Instructions to Students:

1. Solve any Five Questions of the following
2. Illustrate your answers with neat sketches, diagrams, examples etc. wherever necessary.
3. Necessary data is given in the respective questions. If such data is not given, it means that the knowledge of that part is a part of examination.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

- Q. 1 (a) Classify following Software Systems as Product and Services. Justify Your answer (4)
(1) Ubuntu LTS (2) Libreoffice (3) IRCTC Railway Reservation System (4) Whatsup Messenger
- Q. 1 (b) Classify given Risks in following categories : (a) Users (b) Requirements (4)
(c) Project Complexity (d) Planning and Control (e) Team (f) Organizational Environmental
Risk to be classified are:
1. Users not committed to the project
2. System requirement not adequately identified
3. High level of technical complexity.
4. Immature technology
5. Inadequate estimation of required resources
6. Poor project planning
- Q. 1 (c) Name and define the activities that are performed as a part of *project planning*. (4)
- Q. 2 (a) Represent following design information using UML Class diagram and relationships supported by UML. (6)
1. The Java class **UserInterface.java** imports **BlogEntry.java**.
2. The **BlogAccount** class is optionally associated with zero or more objects of the **BlogEntry** class.
3. An **Author** owns a collection of **Blogs**.
4. A **BlogEntry** is made up of an **Introduction** and a **MainBody**.
5. A **BlogEntry** and **WikiPage** are both types of **Article**.
- Q. 2 (b) Answer following questions using the UML diagram shown in Figure 1. Shown here (6)
(1) Which type of UML diagram it is? (2) List out all the stereotypes used in the diagram. (3) Write the name of modules referred in the diagram.
- Q. 3 (a) Write any three definitions of Software Architecture (4)
- Q. 3 (b) Name the processing element, data element and connecting element in UML diagram Shown in Figure 1. (4)
- Q. 3 (c) If we consider Software Architecture as a Problem Solving process then what sub-activities are performed as a part of software Architecture. (4)

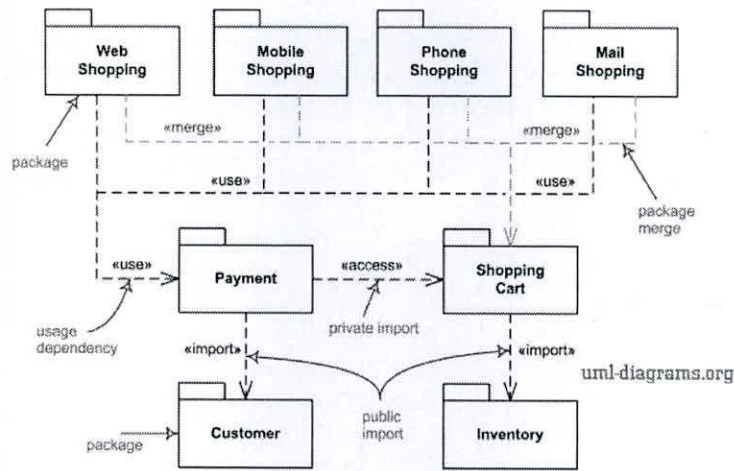


Figure 1 : UML Diagram

Consider following requirements of an application to answer questions numbered from 4 to 5

Develop a complete Python based **Birthday Greeter** to record date of births alumni of your institute and to send the birthday greeting messages to alumni. The greeting messages are to be sent over emails and mobile SMS. Provide a feature to customize the birthday greeting message according to gender of recipients. The system shall record or import the date of birth information and contact details from simple text file or xlsx file or JSON file. Design the system anticipating following future requirements.

1. System shall support audio message.
 2. System Shall support video message.
 3. System shall configure natural languages for text messages.
 4. System shall recommend an appropriate birthday message or greeting card from a gallery of cards by analyzing recipients social profile available on platforms such as Facebbok/Twitter.
 5. System shall create a dispatch order for cookies.
 6. System shall provide web access as well as mobile access to the system functionality.
 7. System shall provide features to post messages on social networking sites such as Facebbok/Twitter.
 8. System shall have an analytics engine to analyze the profile of alumni on social media such as Facebook/Twitter/LinkedIn and to recommend an appropriate greeting message from the available gallery of messages/cards.
- Q. 4 (a) Identify the important stakeholders of the system and their concerns for the above mentioned requirements. (6)
- Q. 4 (b) Identify at least ten functional requirements. Which are the identified requirements are architecturally significant requirements and why?. (6)
- Q. 5 (a) Describe following Non-Functional requirements in the context of above mentioned application (1) Performance (2) Availability (c) Security (6)
- Q. 5 (b) Specify an Architectural Solution based on *Model-View-Controller (MVC)* pattern by clearly identifying the responsibilities assigned to the design elements i.e. Model, View and Controller. Is it more appropriate to use MVC pattern over Publish Subscriber ? Why? (6)
- Q. 6 (a) Develop a concurrency viewpoint for the application. How many Processes/threads you will use? Allocate responsibilities to different processes and threads. (6)
- Q 6(b) What are the architectural decisions that may encounter in this application. List out alternatives for each decisions and preferred choice along with your justification for that. (6)

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