school of computing, informatics, & decision systems engineering

ASU Ira A. Fulton Schools of Engineering Arizona State University

CSE 460: Software Analysis and Design

Online Shopping Store Project

Purpose:

Software quality can be relative to various stakeholder perspectives; it is important for designers to be able to identify software quality needs and how to measure it. This project provides students with the opportunity to put their knowledge of software quality attributes and documentation into practice. Students will evaluate the description of an online clothing store to develop appropriate quality attribute scenarios and produce software architecture documentation using the C4 approach.

Objectives:

Students will be able to:

- Develop quality attribute scenarios from given software design requirements
- Assess the software quality needs for a given project
- Develop software architecture documents using C4 software architecture documentation notations

Technology Requirements:

Access to a modelling and drawing tool to create software architecture diagrams based upon the C4 model.

C4 software architecture modeling tools:

- **Draw.iO - *strongly* preferred**
- Structurizr
- Structurizr Express
- C4-PlantUML
- Structurizr for Java/.NET + PlantUML
- Structurizr for Java + Graphviz
- Structurizr.Dgml
- C4 Detonator
- OmniGraffle
- Sparx Enterprise Architect

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Project Overview:

Phase I: Develop Measurable and Testable Quality Attribute Scenarios

Phase II: Software Architecture Documentation using C4 approach

Deliverables: Online Shopping System Submission Document, submitted as a PDF

Project Description:

Online Shopping Store Description:

Suppose there is a client-server web application that implements online shopping systems for a department store that sells clothing. The main business goals of the application are to make online clothes-shopping a positive experience for customers, increase the sales of well-known brands, and introduce new brands. This store expects 24 hours a day and 7 days a week availability, and the responses to customer queries for clothing selections, checkout, and other operations should occur in 20-30 seconds.

This system offers a more customized clothing selection process, utilizing a virtual fitting-room functionality that shows customers how the clothing may look on them. Customers have the option to enter their weight, height, and other relevant parameters and select an option that allows them to virtually “try on” the clothing.

For future shopping purposes, each customer’s shopping history, address, contact information, and payment methods are stored on the system.

In the case of a failure, the system is expected to recover as fast as possible, with no more than 10 minutes of downtime. The data’s confidentiality and integrity is a high priority. The online shopping application expects to expand its customer base and make the shopping application available across different types of mobile devices in addition to client-server web access. Therefore, three of the most important quality factors for this system are time behavior, confidentiality and data integrity, and recoverability.

This store uses three third party systems: a credit card payment system for processing payments, a delivery system for shipping and handling, and an email system through which customers receive confirmation emails and receipts after each purchase.

Submission Directions for Project Deliverables

Read the description of the online shopping store provided, then respond to the prompts for Phases I and II. Use the Online Shopping Store Submission document to enter your responses.

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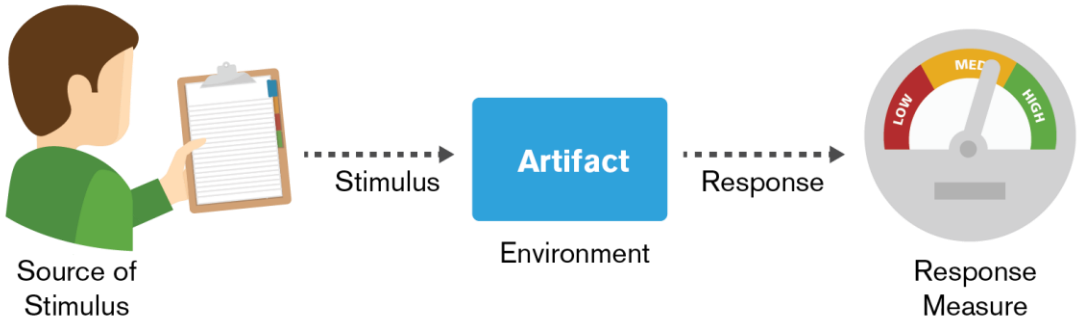
Save all responses as a single PDF titled “Last Name_First Name_Online Shopping Store Project_Submission”

Phase I - Directions:

. Submit your answers for this phase using the Online Shopping Store Submission Document. Assume that the client-server web application that Online Shopping Store is designed and implemented as a client-server web application. For each of the quality factors (time behavior, confidentiality, and recoverability) from the online shopping system described, first develop the quality attribute scenario using the following six part quality attribute scenario model, then briefly explain how to test above quality factors for a client-server web application.

Scenario:



Phase II - Directions:

Submit your answers for this phase using the Online Shopping Store Submission document. Identify the main components in the online shopping system and draw the following software architecture diagrams:

- Level 1: System diagram
- Level 2: Container diagram
- Deployment diagram

Please refer to the “From Requirements to Objects” lectures and this link for the C4 diagram terminology and usage. (https://c4model.com/)

You may use the Draw.iO diagramming tool to construct these diagrams. Draw.iO is an open source free software that has C4 modeling plugging. The following link is a tutorial that shows the step by step process for using Draw.iO to construct C4 architecture diagrams.

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https://github.com/tobiashochguertel/c4-draw.io