Software Systems Design (2023) Architecture

Assignment 3

(40 Points)

You are responsible to design a software architecture for the following system. You should use the Attribute Driven Design (ADD) method and document the final architecture in multiple views. In this assignment, three to four students need to form a group to collectively complete the assignment. The score of each student on this assignment will be determined with the group performance by considering individual contribution to as well as reflection on the work.

DEADLINE: 12:00am on (Monday) June 12, 2023

The Call Center Customer Care (C4) Case Study provided as the supplementary reading for this assignment presents an initial ("Level 1") architectural breakdown for the system used by a large telecommunications company. This system comprises five major subsystems, as described in the reading. The Level 1 architecture is shown as Fig. 1 in the reading.

Assignment Deliverables

A single PDF file should be submitted per group. Your report should be in TWENTY pages (A4 size) or shorter and include the following deliverables:

- A report on how you have followed the Attribute Driven Design method (20 points). You have to perform at least two iterations (10 points per iteration) when designing the architecture. This part includes two components:
    - A list of important non-functional requirements (and constraints) in the format of scenarios that you have identified or assumed.
    - A list of all the architecturally significant requirements (ASRs), design concerns, and architectural patterns/tactics you chose every time when you performed Step 3 (choose an ASR) and 4.2/4.3 (choose architectural patterns/tactics) of the ADD method. This should include all intermediary candidates that might not have been included in the final architecture. A *brief* explanation of the choice should be provided.
- Final software architecture documentation (15 points):
    - Views (models) and cross-views following the template in Chapter 18 [1]. There should be at least three views (with at least one module view)

plus one cross-view. The “rationale” part cannot be omitted. For more information, see [2].

    - You are encouraged to use suitable UML diagrams. Please refer to [3]. For more information about UML, see [4]. However, you may instead choose to use other alternative modeling language notations that you feel more comfortable with.

- Individual remark should be complete by each student (about half page each) in a group (5 points), and contains two components:
    - A description of your personal experiences using the ADD method.
    - A summary of your own contribution to the group work and report.

Notes:

1. You can compile and submit your report in either Chinese or English. You are not necessarily 100% correct in language when using English. However, you should make sure you convey everything in a clear and understandable manner.

2. When you require more information on requirements or affecting factors to make a design decision, you should make an assumption, document it and then make your design decision.

3. There is no minimum length requirement for this assignment, but it should not exceed TWENTY pages. Be concise and to the point.

4. You will be assessed based on your ability to apply the design method and document the design rather than the absolute correctness of you design.

[1] Software Architecture in Practice, 2nd or 3rd Edition

[2] Documenting Software Architectures: Views and Beyond, 2nd Edition

[3] Documenting Component and Connector Views with UML 2.0, Software Engineering Institute

[4] UML Distilled: A Brief Guide to the Standard Object Modeling Language, 2nd Edition