



Department of Electrical, Computer, and Software Engineering

Faculty of Engineering and Applied Science

SOFE 3650-Fall 2020

Software Design and Architectures

Project Description and Deliverables

This document presents a description of the project expectation and deliverables.

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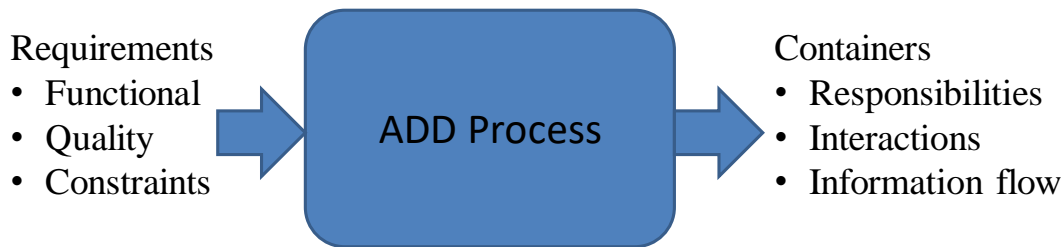
Date: October 2020

Objectives

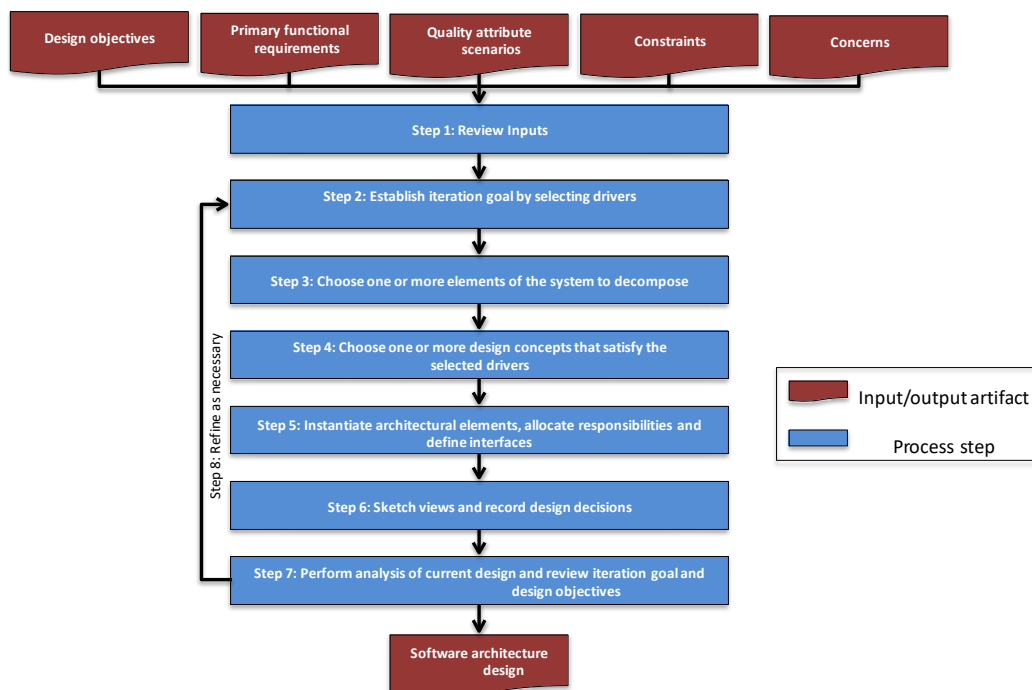
The objective of this project is to demonstrate a methodological set of steps in the design of a software architecture for a set of requirements provided by your instructor. The expected design approach to take is the Attribute Driven Design (ADD) presented in some detail in the text book [1] and briefly overviewed here.

The ADD process

The ADD process takes a set of requirements as inputs and expects an architecture design and description as output as shown in the diagram below.

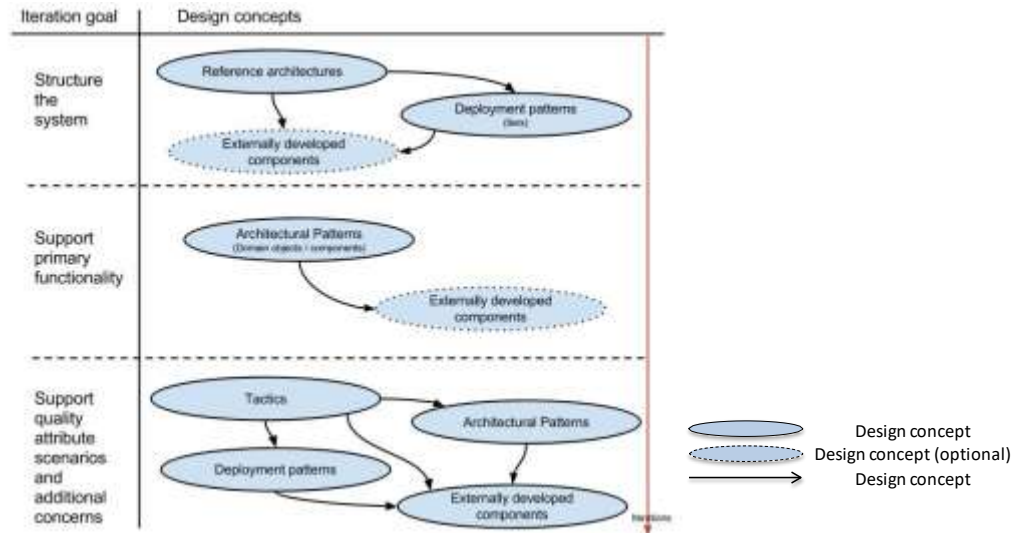


The ADD is a 7 step process as shown in the figure below with the expectation of 2-3 iteration steps of the process.



One of the most common types of software systems is the greenfield systems in mature domains type of system, that is a new system but based on existing architecture patterns and styles. In this type of system the norm is to perform 3 iterations of the ADD method with the respective goals of i) defining

the structure of the system, ii) defining the components of the architecture to achieve the functional requirements of the systems, and iii) refactoring the architecture to achieve the quality requirements of the system. These goals and design concepts for each iteration is shown in the figure below.



Deliverables

The expectation is to submit a set of artifacts in a GitHub classroom repository that your instructor will create for you that demonstrates the ADD steps as applied to the design of an architecture for a Course Management System (CMS). The requirements of the system are posted on Blackboard.

All deliverables should be uploaded to a GitHub repository that the instructor will set up. Individual contributions in the project will be graded based on GitHub commitments of the deliverables and use of the KanBan project board available in GitHub. A good way to manage your project is by leveraging the Issues tagging available through GitHub and the automated KanBan project board.

Deliverable 1 – Use cases, Constraints, and Quality Attributes

Prior to commencing the ADD process the use cases, quality attributes and constraint requirements of the CMS need to be defined based on the CMS requirements. The format of these submissions should follow closely the FCAPS case example in the text book [1].

Expected artifacts are:

- Use Case model
- Quality Attribute Scenarios
- System Constraints

Deliverable 2 – Design of the CMS

This portion of the project should follow the ADD design process. The format of the submission should mimic the FCAPS case example in the text book [1]. Three iterations of the design process are expected and all 7 steps should be included.

Team Assessment Reflection

As a requirement of the course there is a team assessment reflection that should be completed. The purpose of this team evaluation is for students to understand the dynamics and roles of a team. This will be assessed using the ITP metrics tool and instructions will be posted in BB.

Grading Scheme

Part 1: Use cases, constraints, and quality attributes. – 30 marks

1. Use Cases – 10 marks
2. Quality Attributes – 10 marks
3. Constraints – 10 marks

Part 2: ADD Process – 60 marks

1. ADD Iteration 1 – 20 marks
 - a. Step 1 - 2 marks
 - b. Step 2 - 2 marks
 - c. Step 3 - 1 mark
 - d. Step 4 - 4 marks
 - e. Step 5 - 2 marks
 - f. Step 6 - 5 marks
 - g. Step 7 - 4 marks
2. ADD Iteration 2 – 20 marks
 - a. Step 1 - 2 marks
 - b. Step 2 - 2 marks
 - c. Step 3 - 1 mark
 - d. Step 4 - 4 marks
 - e. Step 5 - 2 marks
 - f. Step 6 - 5 marks
 - g. Step 7 - 4 marks
3. ADD Iteration 3 – 20 marks
 - a. Step 1 - 2 marks
 - b. Step 2 - 2 marks
 - c. Step 3 - 1 mark
 - d. Step 4 - 4 marks
 - e. Step 5 - 2 marks
 - f. Step 6 - 5 marks
 - g. Step 7 - 4 marks

Team Assessment – 10 marks

GitHub Classroom Link

The TAs will setup the github link

References

[1] “Designing Software Architectures: A Practical Approach” by Humberto Cervantes and Rick Kazman and covered in the course.