Ain Shams University
Faculty of Engineering
Computer Engineering and Software Systems Program

CSE334: Software Engineering – Spring 2022
CSE128: Software Engineering (1) – Spring 2022

P R O J E C T R E Q U I R E M E N T S

This project is a group project with each group contains 6 or 8 students. You need to propose your project idea to the TA and get approval from her before March 14, 2022, where you need to upload your project proposal on the LMS as detailed hereafter. Please select one of the following projects' categories and elaborate on a specific idea from the selected category so that you can provide your project proposal document: The project should be fully implemented by a suitable programming language selected by the team, and should be clearly indicated in the project proposal.

- **General Web-based Applications**

  In this category, you might build a web-based application that may be useful for a specific organization such as hospital, bank, educational institute … etc. You will need to use web programming (JavaScript, HTML, CSS, JSP, Python, PHP … etc.). Being specific on the description of the project clarifies the needs and requirements of the project. For example, for an educational institute system, you might focus on student registration, student enrollment, grading system, classroom allocation system … etc. On the other hand, for a banking system you might focus on online account transactions.

- **General Desktop Applications**

  This category includes stand-alone desktop applications that might be an accounting system, a staff allocation system in an enterprise, outpatient scheduling system for a hospital, fund management in a banking system, stand-alone student enrollment system … etc. This kind of stand-alone application commonly requires coding with a general purpose language such as Java, C#, C/C++ ... etc.

Project Deliverable

The following are required to be delivered by the due date:

- Project code (source code, executable, any additional files for the project to run properly) using the selected programming language stated in the proposal. It must be submitted on LMS in a zip/rar archive
- A *Readme.txt* file that shows how to compile the developed code and how it can be run as well as the required running environment by the project.
- A presentation (in .pptx format) of the different phases of the project. Each group will do the presentation and project demo via Microsoft-Team
- Project document (in .docx format) that contains at least the sections shown hereafter.

A. Project Proposal Document

Due Date: March 14, 2022

The above set of project categories represent outlines of possible ideas, you should elaborate on these ideas, make any necessary changes, and add you own ideas so that you end-up with a rigid project proposal that you can start with. You should submit your proposal to the TA to her e-mail, it should contain the following information for your group (one document for each group):

Cover Page

This page should contain the university name, faculty name and department name at the top of the page. In addition, course code and name, project name, and your names should be provided on the cover page.

Table of Contents

It contains the table of contents of the whole document as well as the page number for each section/sub-section.

Project Name

A meaningful name of the software application you will deliver. The project name may describe the functionality of the project. It may also be an abbreviation of a term(s) that represent the project functionalities. Avoid misleading names and/or abbreviations.

Project Description

A detailed description that elaborates on the selected project outline from the above list is needed. The outlines above are just broad categories; you should think about selecting a specific project from within these categories and customize it by contributing with your own ideas and expanding the whole set of ideas into a concrete project proposal.

Target Beneficiaries of the Project

Who are the beneficiaries of the delivered software application that will be delivered from your project? You may provide a list of all entities that can use your product and how each of them can benefit from your project.

Programming Language

Specify the programming language that you will use to implement the project. The selection of programming language is totally up to your choice. It is recommended that you pick a programming language that you have prior experience with it and at the same time suitable for implementing your project.

Other Resources Needed

Describe all other resources that might be needed by your project such as database engines, additional libraries that you might use in a later stage in the project, certain CASE tools that you might prefer …. etc.

Appendices

This section might be needed if you have extra information that helps clarifying certain issues in your document or you don’t need to distract the reader by adding this information inside the text.

B. Final Project Document

By the end of the project, you need to do a presentation for your project during which you will be discussed in your project in addition to providing a demo for your project. Additionally, a detailed report (one report for each group is required) that contains three sections will be submitted with the project code and any necessary resources needed to execute the deliverable software. The three required sections are as follows:

1. Software Requirement Specification (SRS) document

For the project you have proposed, you need to develop the detailed Software Requirement Specification (SRS) document. This document should contain user requirements, system requirements, feasibility analysis of the project, requirement validation, and anticipated time plan of the project. During the development of this document part of the project team may assume the stakeholder role while the rest can assume the role of the system analyst so that you can conduct interviews, and hence, elicit, review, and validate the project requirements. This section should contain the following sub-sections:

Introduction

The introduction mainly contains the user requirements specifications of the project.

Feasibility Analysis

This section should highlight how the project contributes to organizational objectives, whether or not the project can be engineered using current technology, and if the project can be integrated with other systems (if any) that are used within the target beneficiaries organizations. Part of the project team might assume the stakeholder roles so that the rest of the project team can conduct the required analysis.

System Requirements

This section shall contain the detailed system requirements specifications. It should be separated into two subsections; functional requirements and non-functional requirements. In functional requirements section, you need to list all the requirements that are related to the functionalities that will be provided from your project. While in the non-functional requirements you provide the detailed restrictions that might be imposed on the project but are not considered part of its functionalities (e.g., project duration, portability, inter-operability … etc.).

Requirements Validation

The requirement and source traceability matrices should be at least provided in this section.

Time Plan

In this section, a time plan of all phases of the project is detailed. A Gantt chart should be provided to show the anticipated time for each phase as well as the overlapping among the different activities of the project.

Conclusion

You might add a conclusion section to summarize the document in one or two paragraphs.

2. Analysis and Design document

In this section, you need to develop the detailed analysis and design document. This document will contain system architecture that shows how the project is decomposed into a set of interacting sub-systems. For each of these sub-systems you need to provide the Data Flow Diagrams (DFDs) starting from the context-level DFD and working all the way to the DFD that has enough level of details that can be directly translated into an implementation. You need also to detail the control style (model) you will use to control the flow among the subsystems of your project. In addition to the detailed user-interface design. This section should contain the following sub-sections:

Use-Case Diagram and the Swimlane Diagram for each Use Case

Use-case diagram with the swimlane diagram of all the uses cases should be provided in this section.

Interaction Diagrams

This section should contain the interaction diagrams (either sequence diagrams or collaboration diagrams could be adopted) for each use case in the project. Proper descriptions and/or comments on the provided diagrams should also be shown in this section.

State Diagram

This section should contain the detailed state diagram for the whole system, all assumption you used in the state diagram should be stated explicitly in this section.

Data Flow Diagrams

For each sub-system in the system architecture, you need to provide the Data Flow Diagrams starting from context-level DFD and ending at the level that provides enough details so that you can use them directly to implement your project. Please use standard symbols for sketching DFDs, you need also to provide all assumptions you used while developing the DFDs.

System Architecture

This section should contain the system architecture of your project. The system architecture should be provided in the form of a block-diagram that shows the major sub-systems in your project and how they interact with each other. You need to provide an explanation of the system architecture that shows your assumptions and any clarification that might be needed and cannot be added to the block-diagram. **You should use the DFD to design your system architecture**.

Component Diagram

The component diagram of your system that shows the major components and the classes that represent each component, and how the components are interacted should be provided in this section.

Class Diagram

The class diagram for your system that show the data members of each class and its functionality and also show the relations between the classes

User Interface Design

This section contains the user-interface design of your software and the justifications for your choices. It should contain the mockups of your screen and the evaluation of them.

3. Cost Estimation

This section should include the details of the cost estimation for your system using the Functional point methodology

4. End-User Guide

In this section, you provide the details of how to use your software. Screenshots and sample output of your software must be provided and commented. Step-by-step description of how to use your software is highly recommended in this section.

Conclusion

This section summarizes the document in one or two paragraphs.

Appendices

This section might be needed if you have extra information that helps clarifying certain issues in your document that you don't need to distract the reader by adding them inside the text.

Notes:

- Use UML notations (where applicable) for the diagrams you provide in your document.
- Use a professional drawing tool (e.g., MS-VISIO) to draw the diagrams in your document.
- Use consistent document format (font sizes, titles, subtitles, captions, paragraph formatting … etc.). Recommended font sizes are: main title 14pt, subtitles 12pt, main text 12pt, and captions 10 pt. Recommended font type is "**Calibri**" bold for titles and subtitles, and "Calibri" for all other texts. Recommended spaces before and after paragraphs are 12pt before and 6pt after each paragraph, and 1.5 spacing is highly recommended. Justified paragraphs from both sides are also recommended.
- Figures and tables must be centred in the pages, and they should be numbered separately. Each figure/table must have a caption that appears below the figure/table.
- Pages must be numbered consistently except the cover page.
- All reports must be written in English, always avoid typos and grammatical errors.
- All project deliverables must be uploaded to the LMS, no hardcopy is accepted, and please never send your project deliverables by email.
- Report will undergo plagiarism checking.
- An online presentation, discussion, and demo is required by the end of the project.