

CSC 4350/6350 SOFTWARE ENGINEERING

Assignment #3

Summer 2018

due Friday, June 22nd, 11:59 pm

Objective: Learn how to do activates planning and scheduling; Learn Collaboration tools; Requirements Engineering- understand the main requirements engineering activities of elicitation, analysis and validation, fundamental system requirements modeling in perspectives of context, interaction, structure, and behavior; develop requirements based tests; database specification and analysis.

a) **Planning and Scheduling (for requirement and system modeling, not the whole project):**

- **Outline plan**, showing principal tasks and milestones.
 - Challenges and Risks
 - What is the single most serious challenge you see in developing the product on schedule?
 - Write down 2+ risks you can foresee in completing this project
 - Ways to avoid or lessen/ minimize the risks
- **Scheduling**
 - Work breakdown: (Create a table, see the **e.g.** below)
 - Identify the **tasks**
 - Each task has a **duration** in calendar hours, days, or months,
 - a **deadline** by which the tasks should be complete
 - Organize tasks **concurrently** if needed
 - Minimize task **dependencies** (to avoid delays caused by one task waiting for another to complete)
 - Allocate **people** to the tasks
 - An **effort estimate**, which shows the number of person-days or person-months to complete the work,
 - **Monitoring** and **reporting** mechanisms

Table example: You can add more columns if needed, number of rows depends on the number of tasks you have identified for your problem

Task	Effort (person-days)	Duration (hours/or days/ etc)	Dependencies
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- b) Based on the feedback and the additional topics covered in class, you are to revise, refine, complete and include your problem statement and requirements with A3.
- c) Revise, complete and create your system use case diagrams

d) Use the following template for your use cases description:

- **Summary:** The customer requests cash and the ATM dispenses the cash.
- **Basic Course of Events:**
 - 1. Completion of use case *Validate PIN*.
 - 2. The customer selects the withdrawal menu option.
 - 3. The ATM asks the customer for the account from which to withdraw the cash.
 - ...
 - 9. If there are sufficient funds, the cash is dispensed and the amount is withdrawn from the account.
 - 10. Complete use case *Complete Transaction*.
- **Alternative Paths:** In steps 4, 6, and 8, the customer can cancel the transaction and go directly to step 10. If the customer does not confirm the account in step 8, proceed directly to step 10.
- **Exception Paths:** In step 9, if there are not sufficient funds, then an error message is displayed and execution proceeds to step 10.
- **Precondition:** The Validate PIN use case completed successfully.
- **Postcondition:** The cash is dispatched and the amount has been withdrawn from the selected account.

This document will form the basis for your design and implementation efforts.

e) Develop a collection of requirements based tests to:

- Improve the requirements in your requirements document
- Form the basis for the testing effort during implementation.
- Use the following template for your test cases:

- **Requirement ID:** Unique identifier
- **Requirement Description:** The requirement, followed by its specification.
- **Rationale:** Context that explains why this requirement was included.
- **Inputs:** If this is a functional requirement that describes an operation, describe the input that must be provided.
- **Outputs:** If this is a functional requirement that describes an operation, describe the output that must be provided.
- **Persistent Changes:** If this is a functional requirement that describes an operation, describe any changes to system state that will persist following this operation.
- **Related Requirements and Use Cases:** Refer to the IDs of any related requirements or use cases.
- **Test Cases:** Tests that can be used to show that the requirement is met.

f) **System Modeling (Analysis)**

- **Class Diagrams (object Modeling, or structural modeling):** (Ch5, 5.3.1, 5.3.2, 5.3.3)
 - Identify objects.
 - What are the associations between them?
 - What is their multiplicity?
 - What are the attributes of the objects?
 - What operations are defined on the objects?
 - Create system class diagram.
- **Behavioral modeling (Dynamic Modeling)**
 - Use the sequence diagrams in (Ch5, 5.4.1) to create your system sequence diagrams.
- **Database specification and analysis:**
 - Specify your system database tables (data attributes and their types) and relationship between them (Primary Keys and Foreign Keys)
 - Specify the type of database management system (MySQL, MS-SQL server, Oracle, etc.) you will use in your project

g) Submit project requirements system modeling VIDEO:

- This video must be 3-5 minutes. You will lose points if it is more than 5m.
- Every team member must participate in this video.
- Use your smart phone camera. Make sure the voice is clear.
- Upload the video to your channel.
- Include the link to this channel with your submission.

Deliverables

- You are required to submit the Planning and Scheduling contents as described above, the revised problem description and requirements modeling and system modeling as described above in one file (pdf).
 - Format should be:
 - First page has (individual page): the project title, group name, members' names, semester, and year.
 - Font size 12, Font type is times new roman, single space between lines.
 - All paragraphs must Text Justified.
 - Pages are numbered
 - Diagrams and tables must be centered.
- Include the following as part of the above document (file) in the Appendix section
 - Submit project problem description VIDEO link.
 - Presentations should be casual and low-stress.
 - Submit GitHub logs.
 - Submit Slack logs.
- You will submit the document electronically through iCollege as a PDF file:
 - The file you submit should be named coordinatorName_Groupname.pdf
 - Only the team coordinator should submit the report
 - Individuals will only get points if they are in a group that has been submitted.

Helpful Hints

- Do not invent many unneeded requirements.
- Focus on the core functionality of the system and do not add “things that would be nice to have”.

“Gold plating” the requirements by adding all kind of nice, but unneeded, functionality and checks will lead to an excessively large and complex document.
- Ensure you have time to complete the assignment, and focus on demonstrating that you can work with a team, learn new tools/languages/technology, and write good requirements.
- While preparing the report, pay more attention to the following criteria:
 - Analysis.
 - Description.
 - Understanding.
 - Preparation.
 - Completeness.
 - Correctness.
 - English Grammar.

Note: More supportive materials for this assignment will be posted in the project Forum at iCollege. So, keep visiting the Forum.