SIT773 Software Requirements Analysis and Modelling

High Distinction (HD) Task 6.4: Research project

Overview

In the high distinction (HD) research task, students are required to perform a self-study and come up with a research problem and solution. The problem and solution should be sufficient in scope and technical content in order to demonstrate competency in:

1. Undertaking a research problem in requirement analysis and modelling areas.
2. Conducting a systematic investigation in order to explore the context, challenges and current status of the selected research problem.
3. Identifying and presenting the requirements of the clients for the selected research problem.

At the end of this task, students will be able to demonstrate their:

1. Research and critical thinking skills
2. Ability to investigate and apply alternative/specific approaches of requirement analysis and modelling to a system that requires supplemental requirement specifications along with the standard requirement specifications.
3. Presentation and written communication skills including organisation of arguments and clarity in writing style.

Some example problems are given below:

- **Mission Critical System**: A mission critical system which has a specific goal sets. Failure of a mission critical system may result in the failure of its goal directed activities which are essential for survival of the system. For example, military missile control system, spaceships, SCADA systems, etc.

- **Safety Critical System**: These are critical systems whose failure may results in loss of life, serious injury or environmental damage. For example, self-driving cars, medical devices, air-traffic control systems, etc.

- **Natural Language to Requirement Analysis**: Business documents, reports, written business procedures, interview transcripts, and questionnaire are requirement artefacts. These are written in any natural language and are shared by the clients with the development team to describe the internal business process and potential system requirements for many systems. It is observed that often these artefacts are very confusing and ambiguous for development team due to natural language description. This introduces risk of inconsistency as a result of mis-interpretation of the language and lack of shared understanding.

Submission Details

Submit the following files to OnTrack:

A report that includes the following:

- Your research report should be based on the answers of all instruction items of 1 to 7 given in the following instructions
- All related artefacts/diagrams

Instructions

1. **Case Study**: Create your own case study based on an example research problem from those presented above. Students are allowed to propose other research ideas relevant to the scope of the unit after getting approval from the instructor. In your case study you need to describe a scenario of an example system.

2. **Problem and Vision Statement**: Write a problem statement and a vision statement based on your case study.

3. **Challenges**: Explain why standard requirement analysis techniques we have covered in this unit are not enough. What are other alternative approaches available to supplement the requirement specification? What are the limitations of those approaches?

4. **Proposed Technique(s)**: Explain the specific analysis procedure(s) that you will use to capture/identify and model the specific requirements of these systems based on your literature review.

   For example: Critical Systems may require to investigate the answers of the following questions:

   a. What are the risks faced by these systems?
   b. How do you analyse and classify these risks?
   c. How do you identify the potential root causes of each identified risk?
   d. How will you eliminate and reduce those risks?
   e. Translate additional requirement specifications from your analysis that will mitigate the risks or defend the risks.

5. **Requirements Specification**: Describe the identified requirements (at least 11) by using the format as outlined in article *3.9 (an example in 3.10)*.

6. Maximum world limit is **2500 words**.

7. Compile a report based on the answers of all items of 1 to 5 given in this instruction template.

8. Make sure that any materials/documents used in your report have been clearly referenced to avoid plagiarism.

9. Submit your work to OnTrack.