HOMEWORK 4- Chapter 5

Q1. What can be some pitfalls to watch out for in ranking requirements?
Ans. Ranking requirements is essential for the understanding the priority of the system. It helps in building the project in a much faster and proficient way. Ranking is the most important quality of SRS documents. Some pitfalls to watch out for in ranking requirements:

- While ranking the requirements, it is essential to understand the system in a perfect manner. Vague understanding of the system lead to inconsistent ranking of the requirement which might lead to the failure of the project.
- Sometime, even the correct ranking of the requirement in the first place doesn't even lead to successful completion of the project. Even though requirement has been ranked in the correct manner at the first place, it is always better to re-check the ranking on the timely basis so we don't miss any importance in the on-going project.
- To make sure we do not give same rank to two requirements otherwise it will lead to wrong interpretation of the SRS.

Q2. Describe two different ways to identify ambiguity in an SRS.
Ans. Ambiguity can be considered as one the drawbacks while creating SRS documents. There are many ways we can identify ambiguity in an SRS. Two different ways we can identity ambiguity in SRS are:

- Checklists: Checklist is a table in which different types of ambiguities can be clubbed and reported easily. Example:
  If one word has multiple meaning throughout the same SRS documents, which is also known as lexical ambiguity. For example, I saw your dog at the bank. Here 'bank' can be financial bank or river bank.
- Scenario-based reading: The overall idea of scenario-based reading is to provide an inspector with an operational scenario, which requires him or her to first create an abstraction of a product, and then to answer questions based on analyzing the abstraction with an emphasis or role that the inspector assumes. For example, the inspector might create test cases for a requirements document and then answer the question, "Do you have all information necessary to develop a test case?". If the question cannot be answered, then a defect may have been detected.

Q3. Which of the IEEE Standard 830 qualities seem most important? Can you rank these?
Ans. All the qualities related to IEEE Standard 830 are important. Personally, I think unambiguous is the most important quality as this will prevent from misunderstanding of the documents. Ranking qualities in order are as follows:

- Unambiguous
- Consistent
- Verifiable
- Correct
- Complete

- Traceable
- Modifiable
- Rank for importance or stability

Q4. For an available SRS document, conduct an informal assessment of IEEE 830 qualities.

Ans. SRS in appendix B for water-waste pumping station. The assessment is as follows:

- Ambiguous: All the requirements mentioned are unambiguous and have only one interpretation. No difficulty in understanding the requirements and one clearly interprets in the right way. The only negative issue is with no shall not requirements.
- Consistent: It is consistent throughout. A domain vocabulary is first defined in the beginning and all the requirements follow those meaning only. No two different meanings are visible in the context.
- Verifiable: The system is not verifiable as we cannot measure the extent upto which certain requirements are seen.
- Correct: The requirements mentioned are consistent and complete as none of the requirements are counter opposite of each other. They are all defined in their own way and there is no ambiguity and no requirements contradict the other.
- Complete: The system is not complete as all requirements mentioned are for the 'shall' statement but none are mentioned what the system is not supposed to do.
- Traceable: Due to clear headings and sub points, they can be easily traceable from one point to another. There is no chaos made and all the points are clearly mentioned.
- Modifiable: The SRS can be modified easily as everything is organized in a manner and easy traceability leads to easy modification in the system. The sub points are clearly mentioned and can be altered at any point of time.
- Rank for importance or stability: There is no ranking system present and one cannot determine which requirement is more important than the other.

Q5. For each quality attribute in Fig 5.13 discuss its relationship to the Categories of the quality indicators.

Ans. The relationship between the quality attributes and the quality indicators is as follows:

- Apart from "readability" all the other quality indicators satisfy the "complete" quality attribute. They give a complete description of the data.
- The "text structure" and "specification depth" are the only indicators which satisfy the "consistent" attribute. All the other indicators have some or the other inconsistency in defining the document.
- "Correct" attribute is only satisfied by "directives" and "weak phrases". They explain and completely describe the details needed in the SRS.
- "Modifiable" is done only by "imperatives, continuances, text structure, specification depth, and readability". These can be easily modified.
- "Ranking" is supported only by "continuances" and "text structure". Rest all have some issue with the ranking attribute.

- "Imperatives, text structure and specification depth" do not satisfy the "testable" attribute.
- "Imperatives, continuances, text structure, specification depth and readability" are the only indicators which can be traced and thus satisfy the "traceable" attribute.
- Only "text structure and specification depth" have some ambiguity in them and thus do not satisfy the "unambiguous" attribute.
- All the indicators are easy to understand and interpreted with ease. Thus, all satisfy the "understandable" attribute.
- "Validatable" is only satisfied by "text structure and specification depth".
- Only "options" indicator is not "verifiable". Rest all the indicators can be easily be verified.

Q6. Should implementation risks be discussed with customers?
Ans. Implementation risks at a lower level should not be discussed with the customer. Bugging them with small issues is a waste of time and might also reflect in the trust they have in the developers. They might even doubt the efficiency of the developer.
But, the implementation risks which can lead to more investment of capital, or might need more time for the implementation as well might have hazardous effects in the bigger picture, these details must be discussed and only when they completed agree should be moved forward with.

Q7. What are the advantages and risks of having requirements engineering conducted (or assisted) by an outside firm or consultants?
Ans. Considering outside firm or consultant for conducting requirement engineering is not a bad idea. They are expert and they do have many years of experience in conducting requirement engineering for various organizations. Like any others things, there are advantages and risks of having outside firm or consultant:

Advantages:
- Expertise on the requirement sector.
- Better time management for the project.
- Better documentation qualities including, unambiguous language, and consistency, complete and modifiable.
- Better financial management.

Risks:
- Might lead to longer period of time than what is projected.
- Might cost company financially for hiring external firm.
- Have a limited relationship, which might lead to miscommunication.

Q9. Calculate the requirements per test and tests per requirements metrics for the data in table 5.2. Do you see any inconsistencies?

Ans. Requirements per test define the requirements which are mandatory for the tests to happen. These define as to what all requirements are needed for a test to be successfully executed. They are important as they help in completing the task of testing.

On the other hand, tests per requirements means all the number of tests which are needed on each of the requirements so one can analyze the meaning of that requirement and interpret the output of the final project.

They both help in analyzing the final outcome by interpreting the requirement details completely and with all assumptions needed.

Q10. Why is the SRS ARM tool useful in addition to the objective techniques of SRS Risk mitigation?

Ans. The SRS tool conducts the analysis of the text in the SRS document and reports certain metrics. The metrics are divided into 2 categories:

- Micro level –count the occurrences
- Macro level- are course grain metrics of the document

This helps in analyzing all the indicators of the system like imperatives, continuances, directives, options, weak phrases, size of requirement, text structure, specification depth, readability etc. All these helps in understanding and gives a much clearer image of the documentation and helps in analyzing the ambiguity in the system when it is completed. So it is very useful in addition to the objective techniques of SRS.