Lecture # 23

Requirements Document

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Recap

- Writing requirements and different aspects of writing requirements

Requirements Document - 1

- The requirements document is a formal document used to communicate the requirements to customers, engineers and managers

- It is also known as software requirements specifications or SRS

Requirements Document - 2

- The services and functions which the system should provide
- The constraints under which the system must operate
- Overall properties of the system i.e., constraints on the system's emergent properties

Requirements Document - 3

- Definitions of other systems which the system must integrate with
- Information about the application domain of the system, e.g., how to carry out particular types of computation
- Constraints on the process used to develop the system

Requirements Document - 4

- It should include both the user requirements for a system and a detailed specification of the system requirements

- In some cases, the user and system requirements may be integrated into one description, while in other cases user requirements are described before (as introduction to) system requirements

Requirements Document - 5

- Typically, requirements documents are written in natural languages (like, English, Japanese, French, etc.)
- Natural languages, by their nature, are ambiguous
- Structured languages can be used with the natural languages to specify requirements

Requirements Document - 6

- For software systems, the requirements document may include a description of the hardware on which the system is to run

- The document should always include an introductory chapter which provides an overview of the system and the business needs

NED LMS

Requirements Document - 7

- A glossary should also be included to document technical terms
- And because multiple stakeholders will be reading documents and they need to understand meanings of different terms
- Also because stakeholders have different educational backgrounds

Requirements Document - 8

- Structure of requirements document is also very important and is developed on the basis of following information
  - › Type of the system
  - › Level of detail included in requirements
  - › Organizational practice
  - › Budget and schedule for RE process

Users of Requirements Documents

- System customers
- Managers
- System engineers
- System test engineers
- System maintenance engineers

Users of Requirements Documents - 2

- System customers
  - › Specify the requirements and read them to check that they meet their needs. They specify changes to the requirements
- Project managers
  - › Use the requirements document to plan a bid for the system and to plan the system development process

Users of Requirements Documents - 3

- System engineers
  - › Use the requirements to understand what system is to be developed
- System test engineers
  - › Use the requirements to develop validation tests for the system

Users of Requirements Documents - 4

- System maintenance engineers
  - › Use the requirements to help understand the system and the relationships between its parts

Six Requirements for RS - 1

- It should specify only external behavior
- It should specify constraints on the implementation
- It should be easy to change
- It should serve as a reference tool for system maintainers

Six Requirements for RS - 2

- It should record forethought about the lifecycle of the system
- It should characterize acceptable responses to undesired events

  › Heninger (1980)

How to Organize an SRS?

- Clients/developers may have there own way of organizing an SRS
- US Department of Defense
- NASA
- IEEE/ANSI 830-1993 Standard

IEEE/ANSI Standard 830-1993

1. Introduction
2. General description
3. Specific requirements
4. Appendices
5. Index

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1. Introduction

1.1 Purpose of the requirements document

1.2 Scope of the product

1.3 Definitions, acronyms, and abbreviations

1.4 References

1.5 Overview of the remainder of the document

2. General Description

2.1   Product perspective

2.2   Product functions

2.3   User characteristics

2.4   General constraints

2.5   Assumptions and dependencies

3. Specific Requirements

- Covering functional, non-functional, and interface requirements. These should document external interfaces, functionality, performance requirements, logical database requirements, design constraints, system attributes, and quality characteristics

Comments on IEEE Standard - 1

- It is good starting point for organizing requirements documents
- First two sections are introductory chapters about background and describe the system in general terms

Comments on IEEE Standard - 2

- The third section is the main part of the documents
- The standard recognizes that this section varies considerably depending on the type of the system

Comments on Organization of SRS - 1

- It should be possible to specify different systems
- It should allow for omitting certain sub-sections and also adding new sections
- These variations should be documented also

Comments on Organization of SRS - 2

- Each SRS has some parts, which are stable and some, which are variant

- Stable parts include introductory chapters and glossary, which should appear in all requirements documents

- Variant parts are those chapters, which can be changed depending on the system

An SRS based on IEEE Standard

- Preface
- Introduction
- Glossary
- General user requirements
- System architecture (reusable architectural components)
- Hardware specification

An SRS based on IEEE Standard

- Detailed software specification
- Reliability and performance requirements
- Appendices
  › Hardware interface specifications
  › Reusable components
  › Data-flow model
  › Object-model

Summary

- Discussed importance and contents of requirements documents, also known as software requirements specification or SRS

- We'll discuss quality attributes of SRS in more detail in the next lecture