IEEE Standard 830-1998
Recommended Practice for Software
Requirements Specification

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Introduce

- What is IEEE?
  - Institute of Electrical and Electronics Engineers 《미》 전기·전자 기술자 협회
  - 1963년 IRE(전파공학자 협회)와 AIEE(미국 전기공학자 협회)를 합병하여 설립
  - http://www.ieee.org/,http://www.ieee.or.kr/

Contents

- Scope
- Definitions
- Considerations for producing a good SRS
- The parts of an SRS

Scope

- Software requirements specification(SRS)
- 효과적인 SRS를 작성하기 위한 표준제공
- SRS를 사용함으로써 개발하고자 하는 프로그램이 요구되는 조건을 정확히 파악

Definitions

- customer
  - The person, or persons, who pay for the product and usually (but not necessarily) decide the requirements.
- supplier
  - The person, or persons, who produce a product for a customer.
- user
  - The person, or persons, who operate or interact directly with the product. The user(s) and the customer(s) are often not the same person(s).

Considerations for producing a good SRS

- Nature of the SRS
- Environment of the SRS
- Characteristics of a good SRS
- Joint preparations of the SRS
- SRS evolution
- Prototyping
- Embedding design in the SRS
- Embedding project requirements in the SRS

Considerations for producing a good SRS(cont.)

- Nature of the SRS

The basic issues that the SRS writer
Functionality
External interfaces
Performance
Attributes
Design constraints imposed on an implementation

Considerations for producing a good SRS(cont.)

- Environment of the SRS
  - Should correctly define all of the software requirements.
  - Should not describe any design or implementation details.
  - Should not impose additional constraints on the software.

Considerations for producing a good SRS(cont.)

- Characteristics of a good SRS
  - Correct
  - Unambiguous
    - Natural language pitfalls
    - Thus, Requirements specification languages
    - Representation tools
  - Complete
    - Use of TBDs(TBD is "to be determined")

Considerations for producing a good SRS(cont.) - Characteristics of a good SRS(cont.)

- Consistent
  - Internal consistency
    - The specified characteristics of real-world objects may conflict
    - Logical or temporal conflict between two specified actions
      - Ex) A가 실행되고 B가 실행 -> A와 B가 같이 실행
    - Describe the same real-world object but use different terms

Considerations for producing a good SRS(cont.) - Characteristics of a good SRS(cont.)

- Ranked for importance and/or stability
  - 고객들이 요구조건을 신중히 평가
  - 개발자들이 올바른 디자인결정과 적절한 노력에 의한 개발
  - Degree of stability
  - Degree of necessity – Essential, Conditional, Optional
- Verifiable
  - "이 프로그램은 무한루프에 빠지지 않는다" (X)
  - "Output of the program shall be produced within 20s of event X 60% of the time; and shall be produced within 30s of event X 100% of the time" (O)

Considerations for producing a good SRS(cont.) - Characteristics of a good SRS(cont.)

- Modifiable
  - Easy-to-use organization
  - Not be redundant
  - Express each requirement separately
- Traceable
  - Backward traceability(이전 개발단계 문서로의)
  - Forward traceability(이후 개발단계 문서로의)

Considerations for producing a good SRS(cont.)

- Joint preparation of the SRS
  - 소프트웨어 개발 과정은 고객와 공급업체의 동의를 거쳐 시작됨
  - 이것은 SRS를 통해 공동적으로 준비되야함
  - 고객이나 공급자 혼자 좋은 SRS를 만들수 없음

Considerations for producing a good SRS(cont.)

- SRS evolution
  - 개발 진행과정에서 evolution이 필요한경우

Two major considerations in this process are the following
Evolutionary revisions가 불가피할경우 그사실을 명시해야함
Evolution의 흔적에 대한 정확하고 안전한 감사를 허용 SRS의 대체된 부분의 review를 허락해야함

Considerations for producing a good SRS(cont.)

- Prototyping
  - 프로젝트 요구사항 부분에 많이 사용됨

Prototyping이 유용한 이유들
고객이 쉽게 이해할수 있음
예측할수 없었던 상황을 보여줌
개발시간 단축

Considerations for producing a good SRS(cont.)

- Embedding design in the SRS
  - Partitioning the software into modules
  - Allocating functions to the modules
  - Describing the flow of information or control between modules
  - Choosing data structures

Considerations for producing a good SRS(cont.)

- Necessary design requirements
  - Keep certain functions in separate modules
  - Permit only limited communication between some areas of the program
  - Check data integrity for critical variables

Considerations for producing a good SRS(cont.)

- Embedding project requirements in the SRS
  - Cost
  - Delivery schedules
  - Reporting procedures
  - Software development methods
  - Quality assurance
  - Validation and verification criteria
  - Acceptance procedures

The parts of the SRS

Table of Contents

1. Introduction
   - 1.1 Purpose
   - 1.2 Scope
   - 1.3 Definitions, acronyms, and abbreviations
   - 1.4 References
   - 1.5 Overview
2. Overall description
   - 2.1 Product perspective
   - 2.2 Product functions
   - 2.3 User characteristics
   - 2.4 Constraints
   - 2.5 Assumptions and dependencies
3. Specific requirements (See 5.3.1 through 5.3.8 for explanations of possible specific requirements. See also Annex A for several different ways of organizing this section of the SRS.)

Appendixes

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Figure 1—Prototype SRS outline

The parts of the SRS(cont.)

- Introduction(section 1 of the SRS)
  - 다음과 같은 subsections을 포함
    - Purpose
    - Scope
    - Definitions, acronyms, add abbreviations
    - References
    - Overview

The parts of the SRS(cont.)

- Overall description(section 2 of the SRS)
  - Describe general factors(Six subsections)
    - Product perspective
    - Product functions
    - User characteristics
    - Constraints
    - Assumptions and dependencies
    - Apportioning of requirements
  - Section 3 을 이해하기 쉽게 도와줌

The parts of the SRS(cont.)

Overall description(section 2 of the SRS) – (cont.)

- Product perspective(2.1 of the SRS)
  - System interfaces
  - User interfaces
  - Hardware interfaces
  - Software interfaces
  - Communications interfaces
  - Memory
  - Operations

The parts of the SRS(cont.)

Overall description(section 2 of the SRS) – (cont.)

- Product functions(2.2 of the SRS)
  - Software의 주된기능을 요약하여 제공
  - 처음 읽는 고객도 이해할수 있도록 작성되야함
  - 텍스트와 다이어그램을 사용하여 변수들과의 관계를 나타낼수 있음

The parts of the SRS(cont.)

Overall description(section 2 of the SRS) – (cont.)

- User characteristics(2.3 of the SRS)
  - 고객의 교육수준 경험, 전문기술을 고려하여 사용자를 위한 일반적인 특징을 기술
  - Specific한 요구사항은 3장에서 설명하게 유도

The parts of the SRS(cont.)

Overall description(section 2 of the SRS) – (cont.)

- Constraints (2.4 of the SRS)
  - Regulatory policies
  - Hardware limitations (e.g., signal timing requirements)
  - Interfaces to other applications
  - Parallel operation
  - Audit functions
  - Control functions
  - Higher-order language requirements
  - Signal handshake protocols (e.g., XON-XOFF, ACK-NACK)
  - Reliability requirements
  - Criticality of the application
  - Safety and security considerations

The parts of the SRS(cont.)

Overall description(section 2 of the SRS) – (cont.)

- Assumptions and dependencies(2.5 of the SRS)

- Apportioning of requirements (2.6 of the SRS)

The parts of the SRS(cont.)

- Specific requirements(section 3 of the SRS)
  - 디테일한 부분의 요구사항까지 모두 포함
  - 시스템의 input에서 output까지
  - 가장 크고 가장 중요한 부분

The parts of the SRS(cont.)

Specific requirements(section 3 of the SRS) – cont.

- External interfaces (3.1 of the SRS)
  - Name of item; Description of purpose
  - Source of input or destination of output
  - Valid range, accuracy, and/or tolerance
  - Units of measure
  - Timing
  - Relationships to other inputs/outputs
  - Screen formats/organization
  - Window formats/organization
  - Data formats
  - Command formats
  - End messages

The parts of the SRS(cont.)

Specific requirements(section 3 of the SRS) – cont.

- External interfaces (3.1 of the SRS)

이름	리모트 컨트롤러를 통한 입력 처리
목적 / 내용	IPTV 사용자가 리모트 컨트롤러를 통하여 IPTV에 명령 전달
입력 주체 / 출력 목적지	사용자 / IPTV형 클라이언트
범위 / 정확도 / 허용오차	리모트 컨트롤러의 버튼 수에 따른 입력 범위 / 리모트 컨트롤러의 정확도에 따른 입력 정확도 / 적외선 수진 장치의 수신률에 따른 허용 오차
단위	버튼 클릭
시간 / 속도	비정기적인 사용자의 입력 / 즉각적인 사용자 명령 수행
타 입출력과의 관계	입력 내용에 따라 클라이언트에서 처리 하거나 서버로 명령 요청
화면 형식 및 구성	해당 없음
윈도우 형식 및 구성	해당 없음
데이터 형식	int 형의 버튼 코드 값
명령 형식	각 버튼의 코드 값에 따른 명령 매핑
종료 메시지	종료 버튼에 의한 종료

The parts of the SRS(cont.)

Specific requirements(section 3 of the SRS) – cont.

- Functions (3.2 of the SRS)
  - Validity checks on the inputs
  - Exact sequence of operations
  - Responses to abnormal situations, including
    - Overflow
    - Communication facilities
    - Error handling and recovery
  - Effect of parameters
  - Relationship of outputs to inputs, including
    - Input/output sequences
    - Formulas for input to output conversion

The parts of the SRS(cont.)

Specific requirements(section 3 of the SRS) – cont.

- Performance requirements (3.3 of the SRS)
  - The number of terminals to be supported
  - The number of simultaneous users to be supported
  - Amount and type of information to be handled

- Logical database requirements(3.4 of the SRS)
  - Types of information used by various functions
  - Frequency of use
  - Accessing capabilities
  - Data entities and their relationships
  - Integrity constraints
  - Data retention requirements

The parts of the SRS(cont.)

Specific requirements(section 3 of the SRS) – cont.

- Design constraints(3.5 of the SRS)
  - Report format
  - Data naming
  - Accounting procedures
  - Audit tracing

The parts of the SRS(cont.)

Specific requirements(section 3 of the SRS) – cont.

- Software system attributes(3.6 of the SRS)
  - Reliability
  - Availability
  - Security
  - Maintainability
  - Portability

The parts of the SRS(cont.)

Specific requirements(section 3 of the SRS) – cont.

- Organizing the specific requirements(3.7 of the SRS)
  - System mode
  - User class
  - Objects
  - Feature
  - Stimulus
  - Response
  - Functional hierarchy
  - Additional comments

- Additional comments(3.8 of the SRS)
  - 추가 요구사항이 있을시 별도의 섹션에 추가

The parts of the SRS(cont.)

- Supporting information(4 of the SRS)
  - SRS를 사용하기 쉽게 만들어 주는 역할
  - Table of contents, index, appendixes 가 포함됨
  - Table of contents
    - 일반적인 관행에 맞추어 표기 – quite important
  - Appendixes(부록) – 꼭 필요하진 않음
    - 입출력 예, user survey 결과, 비용분석
    - SRS reader를 위한 배경정보
    - Software의 문제점에 대한 해결책
    - 부록이 있을경우 명세서의 일부로 넣을지를 표기해야함

The summary