

System Analysis and Design

L07. Other Requirements

Topics

- Other Requirements Artifacts
- Supplementary Specification
- Vision
- Glossary
- Domain Rules
- Evolutionary Requirements in Iterative Methods

Other Requirements Artifacts

- Use cases aren't the whole story.
- **Supplementary Specification:** Such as reports, documentation, packaging, supportability, licensing, etc.
- **Glossary:** Terms, definitions; data dictionary.
- **Vision:** Short summary of overall product
- **Business rules** (or Domain Rules): Rules that affect more than one application, such as tax laws, employee discounts, etc. *[Handwritten note: Business rules]*

How Thorough? 完整性？

- At inception, most requirements have not been fully analyzed or recorded.
大部分需求并没有完整分析,甚至没记录
- However, it is useful
 - to have a high-level list of coarse-grained requirements near the start. 高层需求列表 } 早期阶段
 - to spend early time understanding the non-functional requirements. 一些非功能性的需求 }
- What really matters is quickly building software that passes the acceptance tests to discover users true goals. 尽快建立软件
- We need writing the **Vision** and the **Supplementary Specification** to clarify a first approximation of the product.
- Written requirements will seldom be completely accurate. 不一定正确

补充性说明文档

Supplementary Specification

- The **Supplementary Specification** captures
 - other requirements
 - information
 - constraints
 - system-wide "URPS+" quality attributes
- Which cannot be easily captured in the use cases or Glossary

Elements of the Supplementary Specification

补充性说明文档的内容要素

- FURPS+ requirements functionality, usability, reliability, performance, and supportability
- reports
- hardware and software constraints (operating and networking systems, ...)
- development constraints (for example, process or development tools)
- other design and implementation constraints
- internationalization concerns (units, languages)
- documentation (user, installation, administration) and help
- licensing and other legal concerns
- packaging
- standards (technical, safety, quality)
- physical environment concerns (for example, heat or vibration)
- operational concerns (for example, how do errors get handled, or how often should backups be done?)
- application-specific domain rules 与应用相关领域的规则
- information in domains of interest (for example, what is the entire cycle of credit payment handling?)

Quality Attributes 质量属性(需求)

- These are qualities of the system, not of the attributes themselves, which are not necessarily of high quality. *这与系统质量的属性,并非要求提高*
- The architectural analysis and design are largely concerned with the identification and resolution of the quality attributes in the context of the functional requirements. *识别和解决这些要求与系统结构有关*

这些应该放在55中。

Functionality in the Supplementary Spec? Or in the Use Cases?

- The UP certainly allows feature-oriented approach to requirements, in which case the feature list goes in the Supplementary Specification. *UP允许面向特性的需求，此时可以放入SS*
- The UP encourages use cases for functionality, but they don't always fit.
如果有些特性不适合用用例表述，当然可以放入SS.

Application-Specific Domain (Business) Rules

- General, broad domain rules such as tax laws belong in the UP Business Rules artifact, as a central shared repository. -
一般性的领域规则会放在 BR
 - However, more narrow application-specific rules can be recorded in the SS.
 - such as how to calculate a line-item discount.
- 与应用相关的可以放入 SS.

Information in Domains of Interest

与 SuD 相关的其它一些领域信息的引用.

- It is often valuable to write some explanation of domains related to the new software system
 - (sales and accounting, the geophysics of underground oil/water/gas flows, ...) 与开发工段相关的-些领域解释.
- These information provide context and deeper insight for the development team. 提供更深入的理解
- That document may contain pointers to important literature or experts, formulas, laws, or other references. 可以使用该文引用 .

FURPS+ for NextGen POS

Functionality 功能特性.

- Logging and error handling
 - Pluggable rules
 - Security
- } 放入到 SS 中.
请参考教材中的 SS 例.

Supplementary Specification

Revision History

Version	Date	Description	Author
:	...	-----	--

w-----

FURPS+ for NextGen POS

Usability

可用性

- Text visible from 1 meter
- Avoid colors associated with color blindness
- Speed and ease of use are essential

可读性

FURPS+ for NextGen POS

Reliability

质量属性：可靠性

- Failure of external systems such as payment should be solved with a local solution, such as store and process later
- Prove critical parts of your system **correct**
- Good **error handling**

FURPS+ for NextGen POS

Performance

性能属性(需求): 性能

- Quick lookup of items 快速查找
- Quick processing of payment 快速处理
- (Implies good database design, efficient algorithms) 意味着有效的办法,合理的设计等.

FURPS+ for NextGen POS

Supportability

质量保证; 支持性.

- Adaptability to different kinds of users.
Different stores using a POS have different rules.
支持及同様のユーザーの適応性.
- Configurability: network configurations, credit card processes, etc.
易配置性.

FURPS+ for NextGen POS

Implementation

实现结束

- Java language
- Perhaps MySQL

FURPS+ for NextGen POS

Hardware Interfaces

- Touch screen monitor
- Barcode scanner
- Receipt printer
- Credit card reader
- Signature reader

硬件接口需求

FURPS+ for NextGen POS

Software Interfaces

- Tax calculator
 - Accounting system
 - Inventory
- } 软件接口需求

Vision

导引文件：愿景(设想)

- An executive summary that briefly describes the project 项目概述
- Should not be long, nor to describe requirements in detail. 不要太长
- It should summarize some of the information in the Use-Case Model and Supplementary Specification. 基于用例模型与SS的内容
- It may includes
 - Introduction
 - Positioning
 - Stakeholder descriptions
 - High-level goals
 - User-level goals
 - Product overview
 - Summary of features

包括的内容

The Key High-Level Goals and Problems of the Stakeholders

- Summarizes the goals and problems at a high level
 - often higher than specific use cases
 - and reveals important non-functional and quality goals that may belong to one use case or span many
- Facilitation techniques to discover root problems and goals, and support idea generation and prioritization:

- ◆ mind mapping, 思维导图
- ◆ fishbone diagrams, 鱼骨图
- ◆ brainstorming, brainwriting, 大脑风暴集体创作.
- ◆ multi-voting, dot voting, 多次表决, 记点表决
- ◆ affinity grouping. 相关分组.

创作方法:

Summary of System Features

- System features are **high-level, terse statements** summarizing system functions.
- In the UP, a system feature is "**an externally observable service provided by the system which directly fulfills a stakeholder need**".
- Features are behavioral functions a system can do. They should pass this linguistic test:
 - **The system does <feature X>**.
 - E.g. The system does payment authorization.
- **Guideline:** A Vision with **less than 10 features** is desirable, more can't be quickly grasped. If more, consider grouping and abstracting the features.

Summary of System Features

Guidelines

- For other requirements
 - avoid their duplication or near-duplication in both the Vision and SS.
 - Record them only in the SS.
 - In the Vision, direct the reader to the SS
- Should You Write the Vision or Use Cases First? A suggested sequence is:
 - Write a brief first draft of the Vision.
 - Identify user goals and the supporting use cases by name.
 - Write some use cases in detail, and start the SS.
 - Refine the Vision, summarizing information from these.

另一个文件：词汇表

元数据

Glossary

- Glossary, a document that records data/metadata.
 - During inception the glossary should be a simple document of **terms and descriptions**.
 - During elaboration, it may expand into a **data dictionary**.
- Term attributes could include:
 - Description 描述
 - Aliases 别名
 - Format (for data elements) 格式
 - Relationship to other elements 与其他元素的关系
 - Range of values 取值范围
 - Validation rules 验证规则

Glossary Guidelines

- Start the Glossary early.
 - It will become a repository of detailed information.
- Use the Glossary to Record Composite Terms
 - composite elements such as "sale" (which includes date and location)
复合术语
 - nicknames used to describe a collection of data transmitted between actors in the use cases.
集合名词

POS Glossary

□ Revision History *修改历史*

Version	Date	Description	Author
Inception draft	Jan 10, 2031	First draft. To be refined primarily during elaboration.	Craig Larman

□ Definition

Term <i>术语</i>	Definition and Information <i>定义</i>	Format <i>格式</i>	Validation Rules <i>验证规则</i>	Aliases <i>别名</i>
item	A product or service for sale			
payment authorization	Validation by an external payment authorization service that they will make or guarantee the payment to the seller.			

另一个文件：领域规则

Domain Rules

- Domain rules (business rules) dictate how a domain or business may operate.
 - Company policies, physical laws, and government laws are common domain rules.
- They are not requirements of any one application.
Could apply to more than one project.
- Should be in a separate document 可以写在别的文档中.
 - this analysis can be shared and reused across the organization and across projects.
- The rules can help clarify ambiguities in the use cases
- Application-specific rules can be recorded in the SS

POS Domain Rules 1

□ Revision History

Version	Date	Description	Author
Inception draft	Jan 10, 2031	First draft. To be refined primarily during elaboration.	Craig Larman

□ Definition

ID	Rule	Changeability	Source
R U L E 1	Signature required for credit payments.	可改性	来源

POS Domain Rules 2

ID	Rule	Changeability	Source
RULE2	Tax rules. Sales require added taxes. See government statutes for current details.	High. Tax laws change annually, at all government levels.	law
RULE3	Credit payment reversals may only be paid as a credit to the buyer's credit account, not as cash.	Low	credit authorization company policy

Evolutionary Requirements in Iterative Methods

各工件在进化过程中
的产生与修改时间

Discipline	Artifact	Incep.	Elab.	Const.	Trans.
	Iteration	I1	E1..En	C1..Cn	T1..T2
Business Modeling	Domain Model		s		
Requirements	Use-Case Model	s	r		
	Vision	s	r		
	Supplementary Specification	s	r		
	Glossary	s	r		
	Business Rules	s	r		
Design	Design Model		s	r	
	SW Architecture Document		s		
	Data Model		s	r	