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Chapter Seven

Practical Considerations



Topics to be covered

- Iterative nature of requirements process
- Change management
- Requirements attributes
- Requirements tracing
- Measuring requirements

Why the Iterative Nature of the Requirements Process is Critical?

- ▶ The requirements process is a critical component of software development, as it lays the foundation for the entire project.
- ▶ However, taking an iterative approach to this process is equally important.
- ▶ By iterating on requirements, teams can ensure that they are **meeting the needs** of their stakeholders and delivering a high-quality product.

Cont'd...

- ▶ This iterative nature allows for **feedback** and **adjustments** throughout the project, ensuring that the final product meets the needs of all parties involved.
- ▶ Without this approach, requirements may be **misunderstood** or **overlooked**, leading to **delays**, **rework**, and ultimately, **project failure**.

Benefits of Iterative approach

- ▶ Taking an iterative approach to the requirements process offers several benefits.
 - ▶ It allows for early feedback from stakeholders, which can help **identify potential issues** before they become major problems.
 - ▶ Additionally, it **enables teams to make adjustments** and course corrections throughout the project, ensuring that the final product meets the needs of all parties involved.
 - ▶ Promotes **collaboration** and **communication** among team members and stakeholders, as everyone is working together to refine and improve the requirements.

Change management

- ▶ Concerned with the **procedures, processes, and standards** which are used to **manage change** to a system requirements.
- ▶ Change management policies may cover
 - ▶ The **change request** process and the information required to process each change request.
 - ▶ The process used to analyze the **impact** and **costs** of change and associated traceability information.
 - ▶ **Software support** (if any) for the change control process

Cont'd...

- ▶ A change request may have a **status** as well as requirements. For example:
 - ▶ Proposed
 - ▶ Rejected
 - ▶ Accepted
 - ▶ Included...

Change management process

- ▶ Once requirements problem is identified
 - ▶ Could come from an analysis of the requirements, new customer needs, or operational problems with the system
 - ▶ The requirements are analyzed using problem information and requirements changes are proposed
- ▶ The proposed changes are analyzed
 - ▶ How many requirements and **system components are affected?**
 - ▶ Roughly **how much would cost**, in both time and money?

Cont'd...

- ▶ The change is implemented
 - ▶ A set of amendments to the requirement document or a new document version is produced.



Change request form

- ▶ Proposed changes are usually recorded on a change request form which is then passed to all of the people involved in the analysis of the change.
- ▶ Change request forms may include
 - ▶ Date, customer, requester, product including version
 - ▶ Description of change request including rationale
 - ▶ Fields to document the change analysis
 - ▶ Signature fields
 - ▶ Status

Requirements Attributes

- ▶ Requirements attributes in software engineering refer to the **characteristics or qualities that are associated with the requirements** of a software system.
- ▶ These attributes are used to **describe the properties of the requirements**, such as their completeness, correctness, consistency, and feasibility.
- ▶ Other attributes may include their priority, traceability, testability, and verifiability.

Cont'd...

- ▶ These attributes help to ensure that the requirements are **well-defined, measurable,** and can be effectively implemented and **tested.**
- ▶ It may also include **additional information** each requirement, such as summary rationale for each requirement, the source of each requirement, and a change history.
- ▶ **The more complex the project, the richer the attributes.**

Requirements Tracing

- ▶ RT is a process of documenting and tracking the relationships between different requirements.
- ▶ It involves identifying and documenting the dependencies between requirements, design elements, test cases, and other project artifacts.
- ▶ The purpose of requirements tracing is to ensure that all requirements are met and that changes to one requirement **do not negatively** impact other requirements or project artifacts.

Cont'd...

- ▶ It helps to ensure that the project **stays on track** and that all stakeholders are aware of the status of the project.
- ▶ Requirements tracing is an important part of software engineering as it helps to ensure that the final product meets the needs of the stakeholders and is of high quality.
- ▶ There are different types of requirements tracing, such as **forward tracing**, **backward tracing**, and **bidirectional tracing**.

Cont'd...

- ▶ Forward tracing **involves tracing requirements to design elements and implementation artifacts.**
- ▶ Backward tracing involves tracing **design elements and implementation artifacts back to requirements.**
- ▶ Bidirectional tracing involves tracing requirements to design elements and implementation artifacts, and **vice versa.**
- ▶ Requirements tracing can be done **manually** or with the **help of software tools.**

Traceability Matrix

- ▶ Define links between pairs of elements
 - ▶ E.g. requirements to requirements, use case to requirement, requirement to test case....

	R1	R2	R3	R4	R5	R6
R1			*	*		
R2					*	*
R3				*	*	
R4		*				
R5						*
R6						

How to trace?

Requirement	Depends - on
R1	R3, R4
R2	R5, R6
R3	R4, R5
R4	R2
R5	R6

Measuring Requirements

- ▶ As a practical matter, it is typically useful to have some concept of the “volume” of the requirements for a particular software product.
- ▶ **Functional size measurement (FSM)** is a technique for evaluating the size of a body of functional requirements.
 - ▶ It's a technique used in software engineering to measure the **size of a software system based on its functional requirements.**

Cont'd...

- ▶ Function points are **calculated** based on the number and complexity of the
 - ▶ **inputs,**
 - ▶ **outputs,**
 - ▶ **inquiries,**
 - ▶ **internal files,** and
 - ▶ **external interfaces of the system.**
- ▶ FSM is a useful technique for software **estimation, project planning,** and **project control.**

Cont'd...

- ▶ It provides a **standardized and objective** way of measuring the size and complexity of a software system, which can be used to compare different systems, track changes over time, and improve the accuracy of software estimates.

Reading Assignment

Chapter VII: Practical considerations	Sommerville - 2011	Wiegers - 2003
Practical considerations	Chapter 4 section 1 Chapter 4 section 4 Chapter 4 section 6 Chapter 4 section 7	Chapter 3 Chapter 12 Chapter 14 Chapter 16 Chapter 18 - 21



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END OF CHAPTER SEVEN

