The Forge: A Reforge Companion App

# Validation Report

Requirements Engineering & Analysis

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# Validation of Requirements in General

Requirements validation makes sure that the stakeholder requirements are transformed correctly into system requirements. Validation is done to ensure that the right problem is being solved, compared to verification which is used to ensure that the problem is being solved right.

## How to Validate Requirements

Requirements validation can be done using different techniques. The technique used may vary dependent on the characteristics of the stakeholders. Therefore, multiple techniques may be used to make sure that all stakeholders are represented. Some of the common techniques used are:

- Stakeholder Reviews
- Prototyping
- Modelling and Simulation
- Conceptual Modelling
- Formal Modelling

## Why Validate Requirements

It is important to validate requirements to assess whether the product satisfies customer needs. Meaning that the right product is being created. It also assesses whether the right requirements have been written and can be traced back to the business objectives.

Requirements validation activities are conducted to:

- make sure they are accurately describing the intended system capabilities/properties that satisfy all stakeholders needs.
- That the software requirements are correctly created from the business requirements, system requirements, business rules, and other sources.
- That the requirements are complete, feasible, and verifiable.
- That all the requirements are necessary, and that the entire set is sufficient to meet the business objectives.
- That requirements representations are consistent with each other.
- That the requirements provide enough of a basis to proceed with design and construction.

## When to Validate Requirements

During the requirements process the requirements are explicitly scheduled to be validated on one or more occasions. This is done to discover any problems before time and resources are committed to address the requirements.

## Reviews and Inspections

A very common method of validation is done through inspections or reviews of the requirements documents. The reviewers that are assigned to look for errors, mistaken assumptions, lack of clarity, and deviation from standard practice. The group that conducts the review should be made up of at least one representative of the customer, if it is a customer-driven project. Reviews may be done upon completion of the system definition document, the system specification document, the software requirements specification document (SRS), the baseline specification for a new release, or at any other step in the process. Establish with the stakeholders that requirements are comprehensible and that the resolution of any conflicts in the requirements has been addressed. Obtain agreement to the proposed conflicts and get sign off on the requirements. Inspection is a formal requirement review that produces a report that identifies the material examined, the reviewers, and the review team's judgment as to whether the requirements are acceptable. (well-defined multistage process)

- o Participants:
    - The author of the work product and perhaps peers of the author.
    - People who are the sources of information that fed into the item being inspected.
    - People who will do work based on the item being inspected.
    - People who are responsible for interfacing systems that will be affected by the item being inspected.
- o Inspection roles:
    - Author
    - Moderator
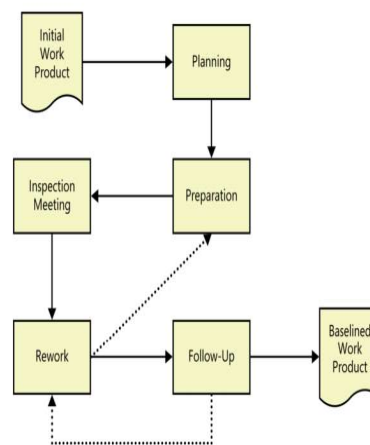    - Reader
    - Recorder



FIGURE 17-2 Inspection is a multistep process. The dotted lines indicate that portions of the inspection process might be repeated if reinspection is necessary because of extensive rework.

## Prototyping to Validate Requirements

An executable model of the system is demonstrated to the customer and end users to validate, and make sure that it meets their needs. Prototyping is used when requirements are not clear. The design of the system is used to validate the requirements. Prototypes help to keep costs down by having a clear, understandable, consistent requirements that can be demonstrated for validation. They can also help find missing requirements. Proof-of-concept prototypes demonstrate that the requirements are feasible. There are also evolutionary prototypes that allow the user to see how the requirements would work when implemented, to validate that the result is what they expected.

## Acceptance test design

An important property of a software requirement is that it should be possible to validate that the finished product satisfies the requirement. It is important to plan how to verify each requirement. Acceptance tests do this for how end-users would typically conduct business when using the system. To be validated, nonfunctional requirements must be analyzed and broken down to where they can be expressed quantitatively. Acceptance tests are a subset of acceptance criteria.

Acceptance criteria can be developed with customers to provide a way to validate the requirements and the solution. Acceptance criteria also encompasses the following:

- Specific high-priority functionality that must be present and operating properly before the product could be accepted and used.
- Essential nonfunctional criteria or quality metrics that must be satisfied.
- Remaining open issues and defects.
- Specific legal, regulatory, or contractual conditions.
- Supporting transition, infrastructure, or other project.

## Requirements Engineering Process and Validation of Behavioral Requirements

The requirements engineering process supports the validation of behavioral requirements by making sure that they possess the characteristics needed for each requirement. These characteristics being that they are necessary, appropriate, unambiguous, complete, singular, feasible, correct, conforming, and verifiable. It would be impossible to validate a requirement that cannot be verified or uses ambiguous language. For example, if the requirement is that the system must be easy to use. This is too vague of a statement and no context is given to determine what easy means. The

process of requirements engineering helps to ensure that behavioral requirements can meet the customers needs by making sure that the requirement is interpreted in the same way by everyone and that the acceptance criteria for that requirement is agreed upon before implementation. This is especially important for behavioral requirements as the langue used to describe behavior can be vague.

## Validation of The Forge: A Reforge Companion App

To perform the necessary requirements validation, a meeting was set up with the CEO of Secret Boss Games LLC. I had hoped to include a representative of the end users but was unable to organize it for this meeting. So, the customer and I went over the SRS and the prototype for the software system. The prototype proved useful for feedback on the design aspects of the system. The suggestions for the placement of certain features were noted. I had also created a Requirements Review Sign-off page that allowed the stakeholder and I to go through the set of requirements one by one and state the verification approach that will be used to prove the achievement of each of the requirements.

The design of this solution allows the customer to make the shift from a physical component to a digital one. This action will lead to the production of the base product being made in the United States instead of overseas in China. The specified needs are met with consideration given to the environmental and economic factors. This software will greatly reduce the carbon footprint of the company since the product will not need to be shipped from such a long distance. It will also lead a decrease in costs for the company and the customer.