

Chapter 2

REQUIREMENT PROCESS

Basics of Requirements Engineering

- What are Requirements?
- Why do we care about Requirements?
- Requirements Engineering in Software Engineering
- Types of Requirements
- Qualities of Good Requirements

Requirements Process

- **Inception**
- **Elicitation**
- **Elaboration**
- **Negotiation**
- **Specification**
- **Validation**
- **Requirement Management**

Inception

The very first step in the Requirements Process
Requirements question about.

- **Who** is behind the request for this work?
- **What** is **requested** and **why**?
- What will be the **benefit** of this work?
- Is there **another source** for the solution needed?

project title :: fridgeMIX

motivations

We live in the dormitory, and often short of an idea for each meal. However, there are plenty of foodstuffs in our fridge. What if there is something to help us figure out some interesting dishes everyday without throwing the expired foods.

objectives

This system helps the users to come up with an idea for a meal they can cook with what they have in their fridge.

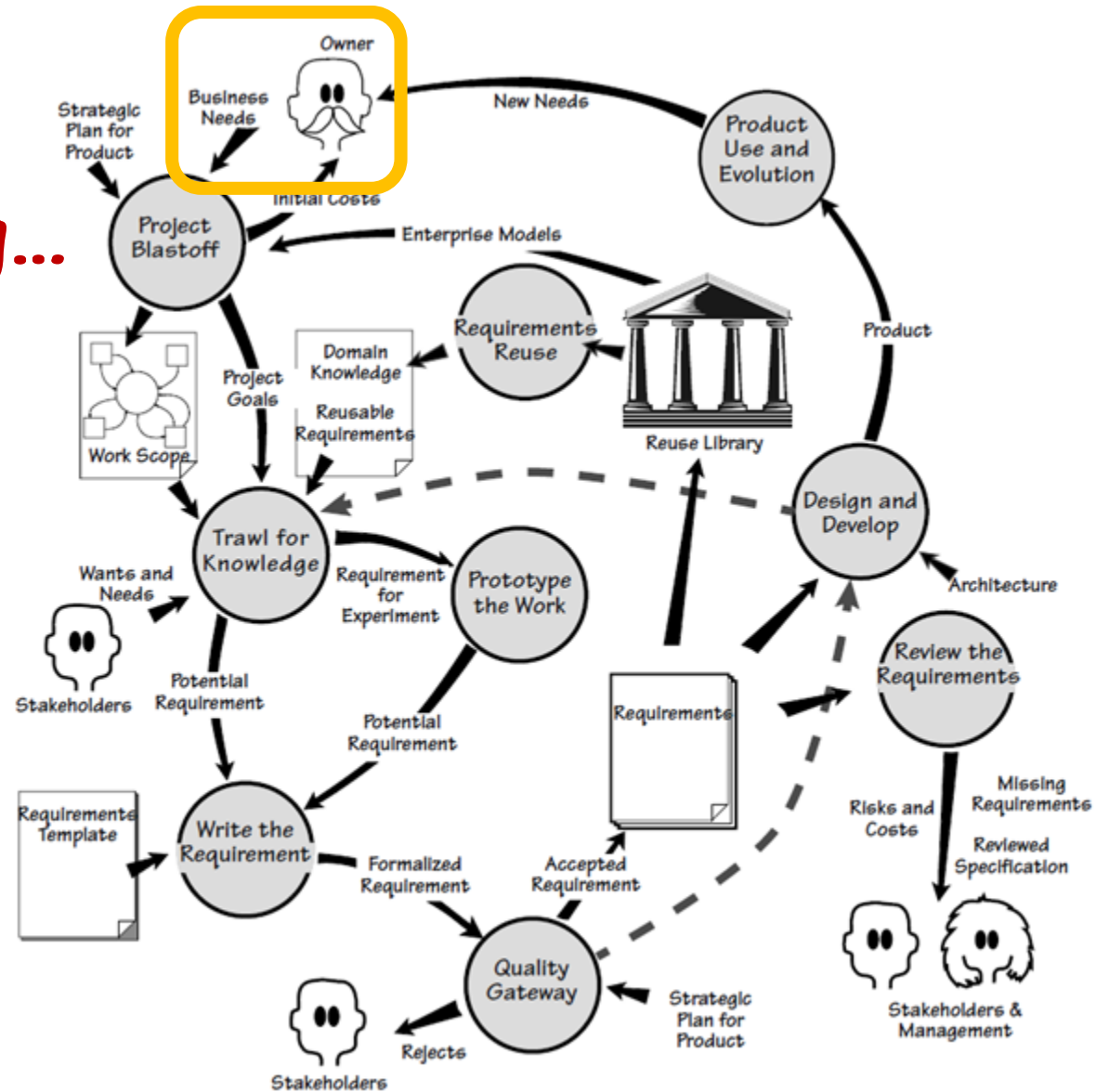
intended users

- dormitory and apartment residents
- lone residents
- anyone who is out of idea for cooking

benefits

- getting an efficient way to cook
- getting rid of the unwanted foods

I need software doing...



Example

“Hey, I have a potential project coming up. Someone I know from my previous project is asking me to build a scheduling system for his customers. **Are you interested in working on the project with me?**”

Finding Stakeholders

Who is a stakeholder?

“anyone who benefits in a direct or indirect way from the system which is being developed.” (Sommerville and Sawyer)

creating list of people who will contribute the input

Your clients, customers, end-users, business operations managers, product managers, marketing people, product engineers, software engineers, support and maintenance engineers, and many more...

intended users

- dormitory and apartment residents
- lone residents
- anyone who is out of idea for cooking

Goal and Outcome

The goal is **getting to know about the project** such as

- a basic understanding of the problem,
- the people who want the solution,
- the nature of the solution that is desired,
- the effectiveness of preliminary communication and collaboration between the client and the developer

The deliverable of the initial meetings is a one- or two-page “**product request**” including stakeholders, overall goals, benefits, scope of the problem, and overall perception of a solution.

Elicitation

Ask the people who are involved in the project

- What are the **objectives** for the system or product?
- **What** is to be **accomplished**?
- How does the system or product fit into the **needs of the business**?
- **How** is the system or product to **be used**?
- What are the **benefits** to the organization?
- Is the project **feasible**? Any potential **risks**?

Goal

The goal is assessing the **feasibility** of the project and making a **Go/No Go decision**.

- Is this **project viable**?
- Is the time and **budget reasonable**?
- Are there **enough resources**?
- Is there **enough information to continue** on with requirements activity?
- Do we need more **time** to make a decision?

Understanding the Problem

Gaining a better understanding of the problem from stakeholders

- Perception of “good” output and a successful project
- Problems to be addressed by the solution
- **Business environment** in which the solution will be used
- **Interaction between** the solution and **other systems or products**

“Scope of the Project/Problem”

Finding More Stakeholders

Making sure the questions are relevant to the problem and encouraging effective communication

- Finding the right person to answer questions
- Checking with people if your questions are relevant
- Finding sources of additional information

“Stakeholders”

Assessing Feasibility

Studying **constraints** and **risks** involved

- Any performance issues or constraints that may affect your approaches to the problems
- **Schedule and budget** (resources, people, etc.)
- Estimated costs

“Costs/Benefits & Potential Risks”

Outcome

The deliverable of elicitation is a **feasibility report** including

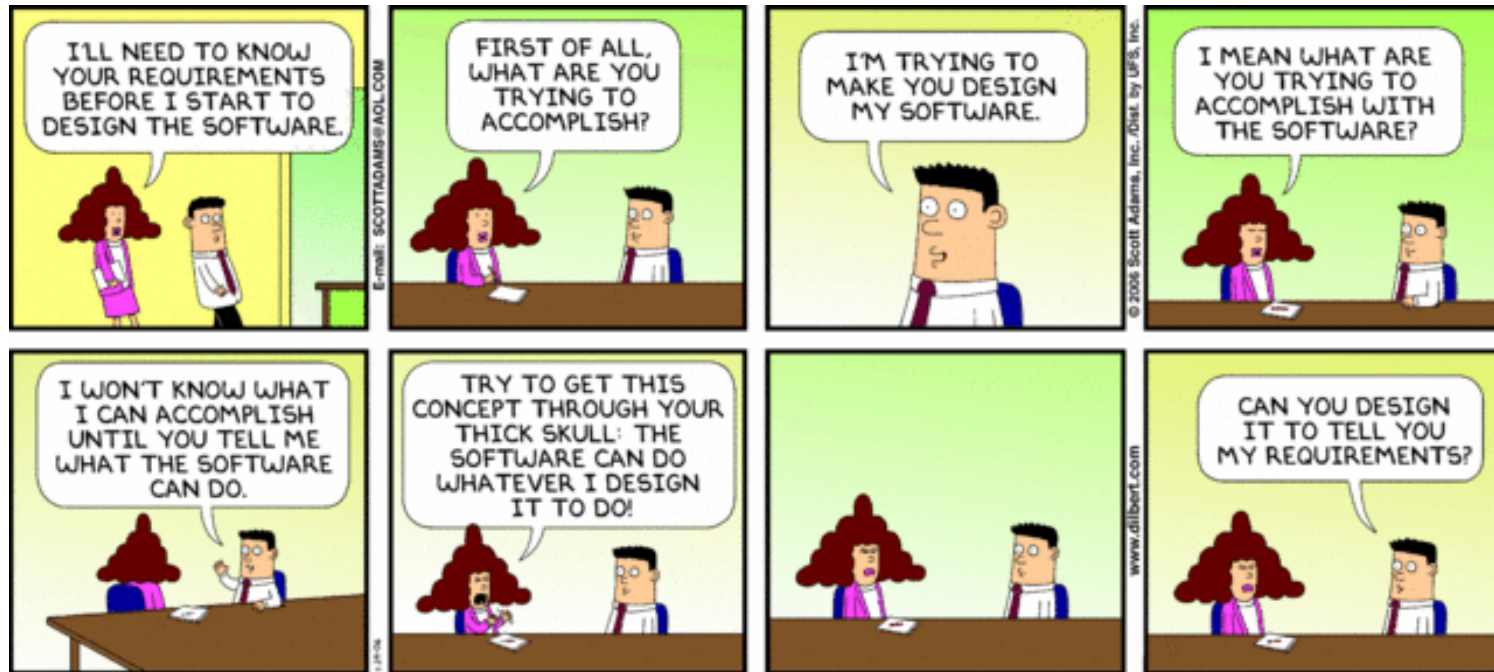
- **Purpose of the project**: a short, quantified statement of what the project is intended to do and what advantage it brings to the business
- **Scope of the work**: the business area affected by the initiation of the product)
- **Stakeholders**: people who have an interest in the product
- **Constraints**: design solution, time and money, etc.
- **Names**: terminology used by this part of the organization
- **Relevant facts and assumptions**
- **Estimated cost**: input to the estimating process and project planning
- **Risks**: a short risk analysis to reveal the main risks faced by the project

Elaboration

Expand and **refine** the information obtained during inception and elicitation

- Developing a refined **technical model** of software functions, features, and constraints
- Defining the informational, functional, and behavioral domain of the problem
- **Developing potential requirements**

The goal is to discover the requirements that are most applicable to the stakeholders. But it is not easy, often frustrating...



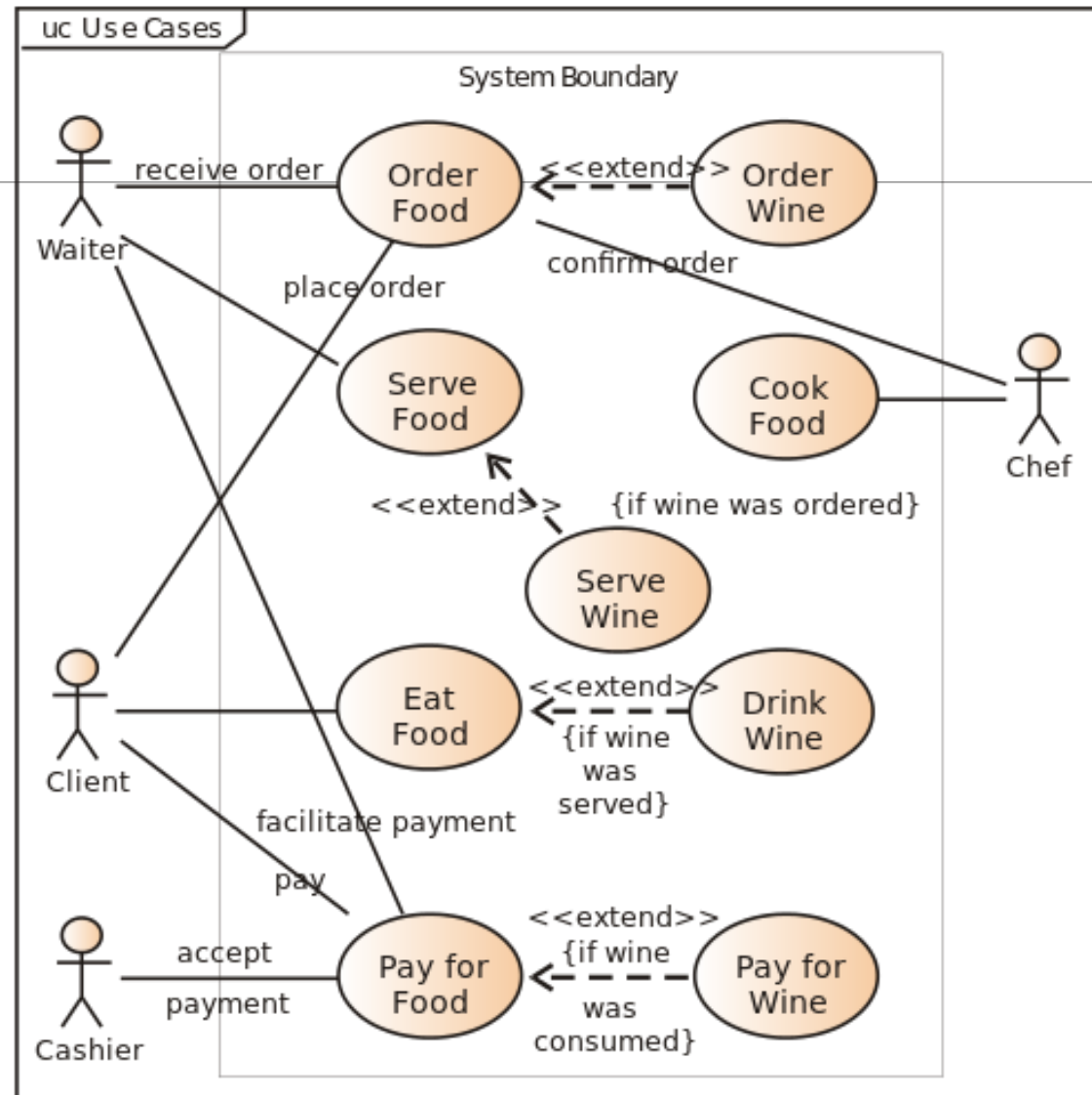
Elaboration Approaches

Many **methods** and **techniques** are used to find and elaborate potential requirements such as

- Facilitated meetings,
- Interviews, Ethnography,
- Use cases, User scenarios,
- Prototypes, etc.

The best choice depends on the characteristics of the project, your product, stakeholders, circumstances, etc.

Use Case



User Scenario

Scenario 1: Register to use Twinkie Manager

User Task Profile Targeted	Business 2 User
Subject Persona	Mary
Scenario Description	Register to use Twinkie Manager

Background:

Mary is an employee of Twinkie.com, a leading Twinkie Trade Group business owned by Nabisco. Mary is responsible for creating and managing Twinkie receivers and Twinkie shipper relationships. She has been given the task of implementing a Twinkie Trade Group using the Twinkie Manager application in order to deliver incremental Twinkies to Twinkie.com's existing customers who are shippers and receivers. One of Twinkie.com's shipper's clients is devildog.com, another Nabisco division.

Objective:

She needs to register and send out invites to other Nabisco.com employees to register as users under the Twinkie.com account.

Narrative:

Mary visits the Twinkie homepage to register for Twinkie Manager. After registering she invites Mary, Matthew, Mark, Luke, John, and Eve to register for T.

Negotiation

Reconcile conflicts and **prioritize requirements** so each stakeholder achieves some measure of satisfaction by

- Asking stakeholders to **rank requirements**
- **Discussing conflicts** in priority
- Identifying and analyzing **risks** associated with each requirement
- Making rough estimation of **development effort**
- **Assessing the impact** of each requirement on project **cost** and delivery **time**

Goal

The goal is developing a **project plan** that meets the needs of the stakeholders while **reflecting the real-world constraints** (e.g. time, people, budget).

Identifying the system or subsystem's key stakeholders

Determining the stakeholders' win conditions

Negotiating with the stakeholders and **win-win** conditions for all concerned

Specification

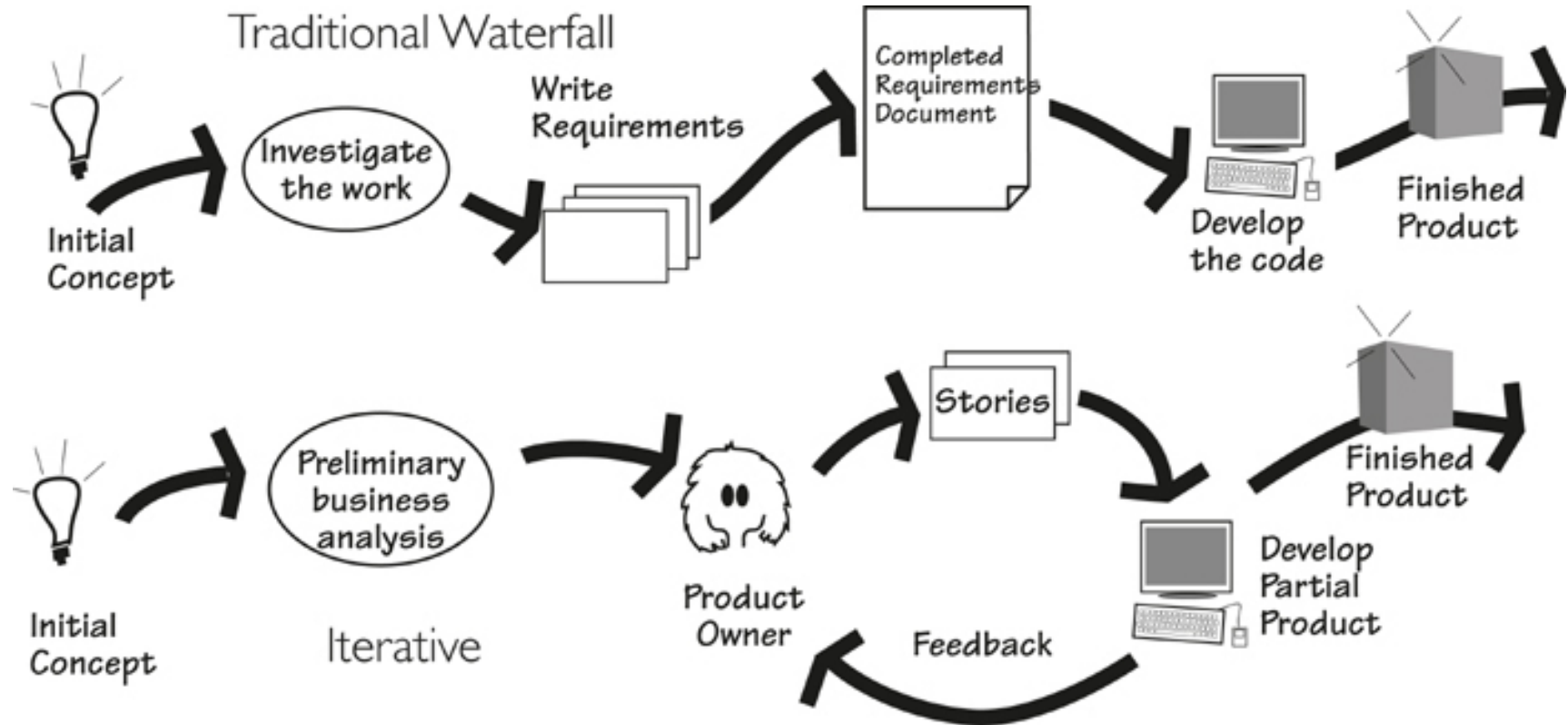
Present requirements in a **consistent** and more **understandable** manner

- a written document,
- a set of graphical models,
- a formal mathematical model,
- a collection of usage scenarios,
- a prototype, etc.

Templates are often used to make the specification step **easier** and more **systematic**.

The **specification** is the final work product produced by the requirements engineer. It serves as the **foundation** for subsequent software engineering activities.

Waterfall vs. Iterative



[Mastering the Requirements Process: Getting Requirements Right, 3rd Edition](#)

Validation

Examine the specification to ensure that it is really **complete** and **suitable** and **reassess the cost and risks**

- detecting and correcting any inconsistencies, omissions, and errors in content or interpretation
- reconciling conflicting requirements or unrealistic requirements
- making sure the work product conforms to the standards established

Questions

Are all requirements consistent with the overall objective for the system/product?

Have all business cases been discovered? Anything missing?

Are all requirements really necessary and essential? Are they valuable to clients or other stakeholders?

Have all requirements been specified at the proper level of abstraction and detail? Anything ambiguous?

Are there any conflicting requirements?

Are all requirements traceable?

Are all requirements testable, once implemented?

Are all requirements achievable? Any potential risks?

How much effort (e.g. time, budget, other resources) do we need?

Goal

The goal of validation is to **prevent incorrect requirements** from becoming part of the specification. It also measures the value, cost, and risk to assess whether it is **worthwhile to continue** development of the product.

Requirements Management

Perform a set of activities that help the project team **identify, control,** and **track requirements** and **changes** to requirements at any time as the project proceeds

- Adapting the requirement process to suit the project
- Publishing the requirements for communicating to different people and organizations for different purposes
- Tracing the requirements through the development of the product
- Dealing with change
- A retrospective to improve your process

Summary

Step	Activity	To Do
Inception	Blastoff Meeting	Problem
Elicitation	Project Scoping, Identifying Stakeholders, Feasibility Analysis, Traditional approaches -> Go/Not Go	refining requirements and evaluation criteria (Get to know more about the problems)
Elaboration Negotiation	Trawling for Requirements Functional & Nonfunctional Requirements, Constraints, Cost & Risks, Fit Criteria, Methodologies and Techniques	Developing potential requirements (Prototype, business-user use case) prioritizing requirements and resolving conflicts

Step	Activity	To Do
Specification	Writing Requirements	writing down requirements (Template)
Validation	Quality Gateway	reviewing the specification (Check Correspondence + Correctness)
Requirement Management	Reusing Requirements, Reviewing Specification, Managing Requirements for later use	tracking changes and maintaining requirements and specifications

<http://showmenowtv.tumblr.com/>

<http://se321teletubbies.blogspot.com/>

<https://naivegroup.wordpress.com/>