Outline

Requirements describe problems

The what vs. how tension, and the role of the Reqts Spec

Sources of requirements

Types of requirements

What is a requirement?

Requirement (def):

> The effects that the client wishes to be brought about in the problem domain

Example: An elevator will only reverse direction when stopped at a floor

worlds

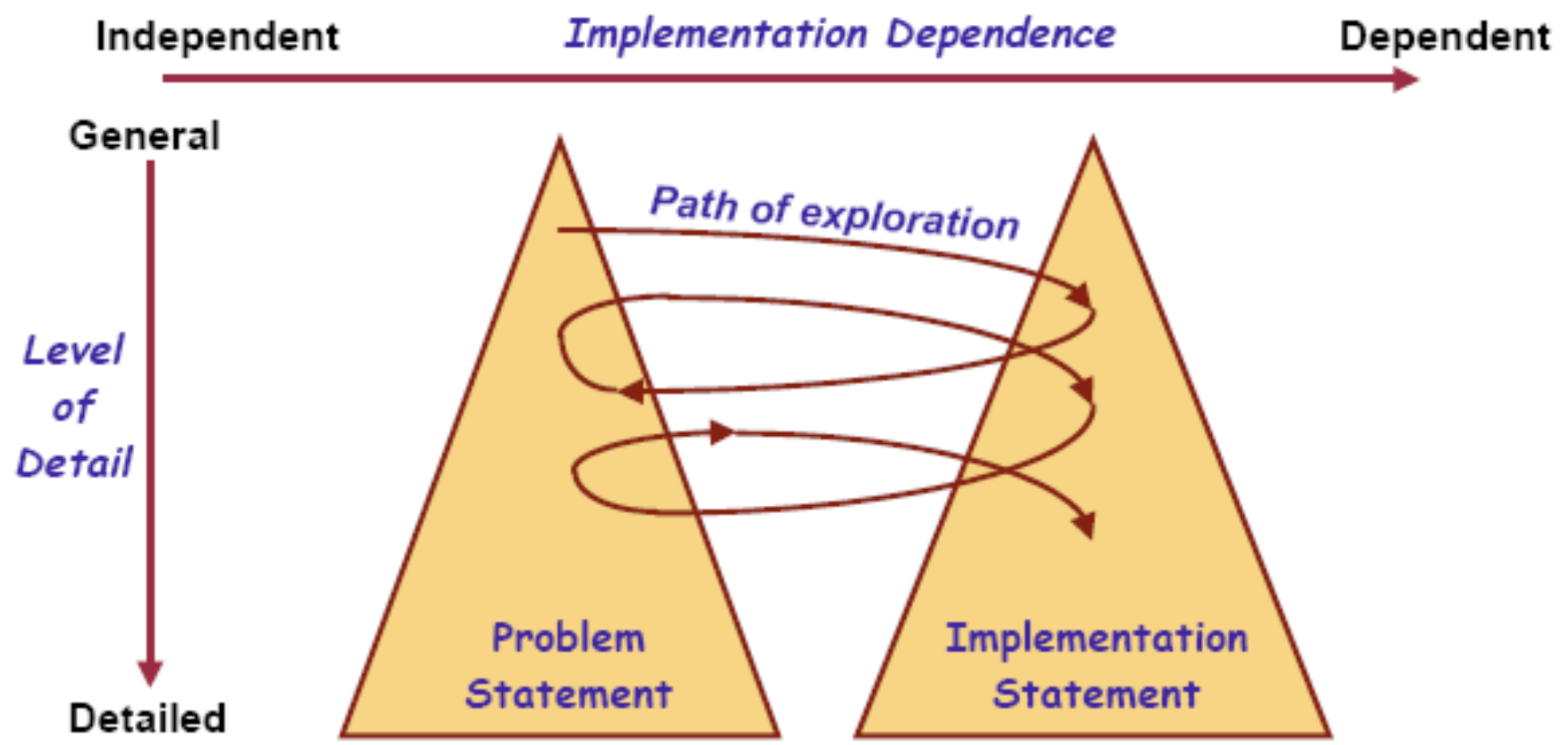


Figure 3: The Twin Peaks model. Exploration of the problem and its possible solutions are closely intertwined. (Adapted from Moffett 1999)

Example – distinction between a problem statement and solution statement

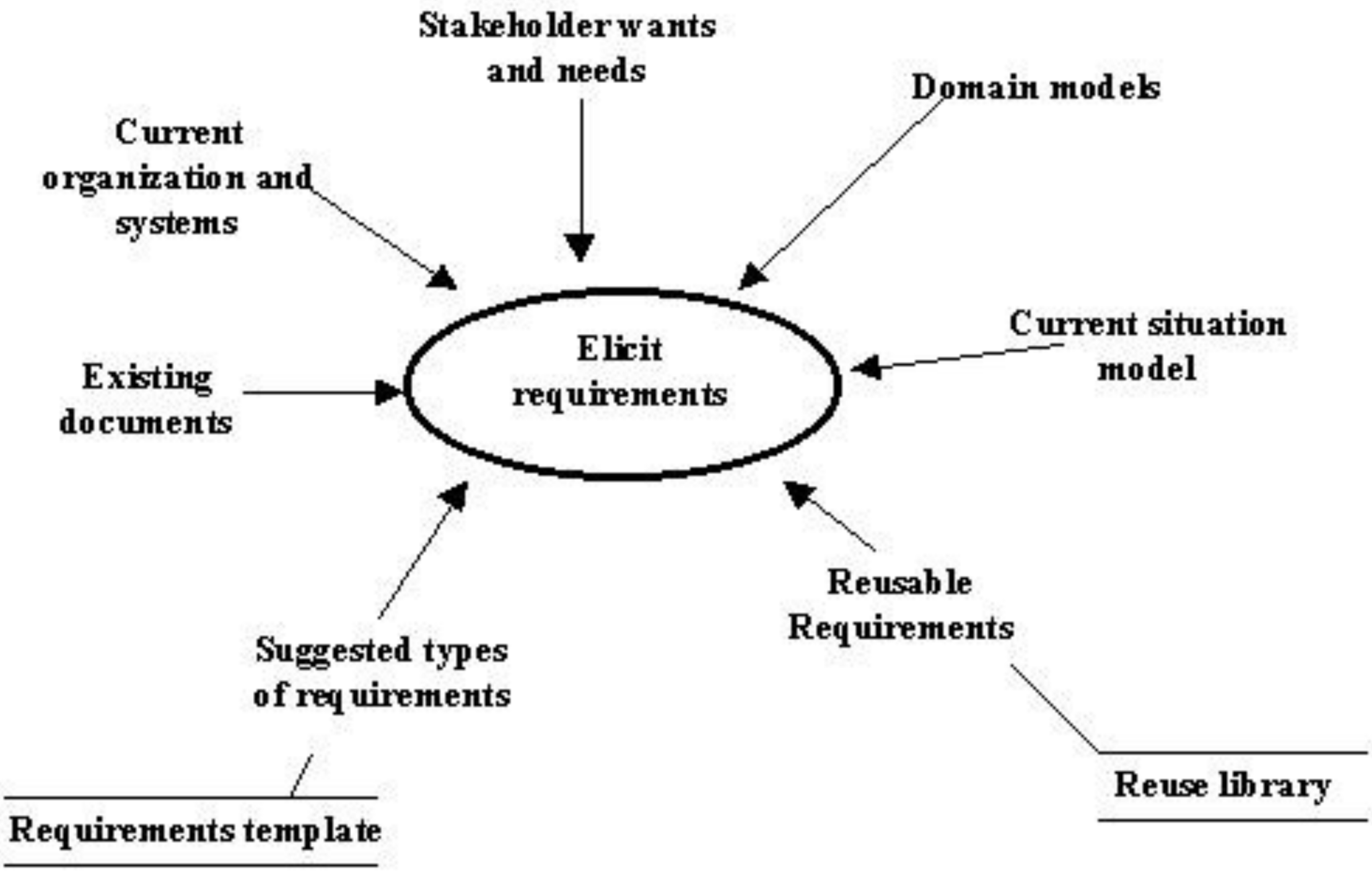
The requirements (for the machine): “prevent access to unauthorized personnel”

Domain properties: “only a manager can assign access authority”

Specification for the machine: “when the user enters a valid password, the computer will unlock the door” (or “the system requires a login and password for access”)

Another Example: requirements, domain property and the specification

“The system (lift controller) will cycle the lift doors every time that a lift stops at a floor”


Stakeholder wants and needs
Domain models
Current organization and systems
Elicit requirements
Current situation model
Existing documents
Reusable Requirements
Suggested types of requirements
Reuse library
Requirements template

Types of requirements

Functional vs. non-functional, OR

- Functionality
- Physical environment
- Interfaces
- Users and human factors
- Documentation
- Data
- Resources
- Security
- Quality assurance

Types of requirements: Functionality

- What will the system do?
- When will de system do it?
- Are there several modes of operation?
- How and when can the system be changed or enhanced?
- Are there constraints on execution speed, response time?(aka non-functional reqts)

Types of requirements: Quality assurance

- What are the requirements for reliability, availability, maintainability, security?
- What is the prescribed mean time between failures?
- Is there a maximum time allowed for restarting the system after a failure?
- What efficiency measures will apply to resource usage and response time?

Types of requirements: Security

- Must access to the system or information be controlled?
- How will one user's data be isolated from others?
- How will user programs be isolated from other programs and from the operating system?
- How often will the system be backed up?

Types of requirements: Physical environment

- Where is the equipment to function?
- Is there one location or several?
- Are there any environmental restrictions, such as temperature, humidity or magnetic interference?

Types of requirements: Interfaces

- Is the input coming from one or more other systems?
- Is the output going to one or more other systems?
- Is there a prescribed way in which the data must be formatted?
- Is there a prescribed medium that the data must use?

Types of requirements: Users and human factors

- Who will use the system?
- Will there be several types of users?
- What is the skill level of each type of user?
- What kind of training will be required for each type of user?
- How difficult will it be for a user to misuse the system?

Types of requirements: Documentation

- How much documentation is required?
- Should it be on-line in book format or both?

Types of requirements: Data

- For both input and output, what should the format or the data be?
- How often will they be received or sent?
- How accurate must they be?
- To what degree of precision must the calculations be made?
- How much data flow through the system?

Types of requirements: Resources

- What materials, personnel, or other resources are required to build, use, and maintain the system?
- What skills must the developers have?
- How much physical space will be taken up by the system?
- Is there a prescribed timetable for development?
- Is there a limit on the amount of money to be spent on development or on hardware and software?

Types of requirements: Design Constraints

- Areas for design constraints include:
- Target machines
- Underlying architecture
- GUI packages
- Programming languages, algorithms

In this lecture

Discussed the difference between the How and What in software development

Discussed the multiple sources of requirements

Types of requirements and possible questions to ask in determining requirements

References

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