OO Analysis and Design with UML 2 and UP
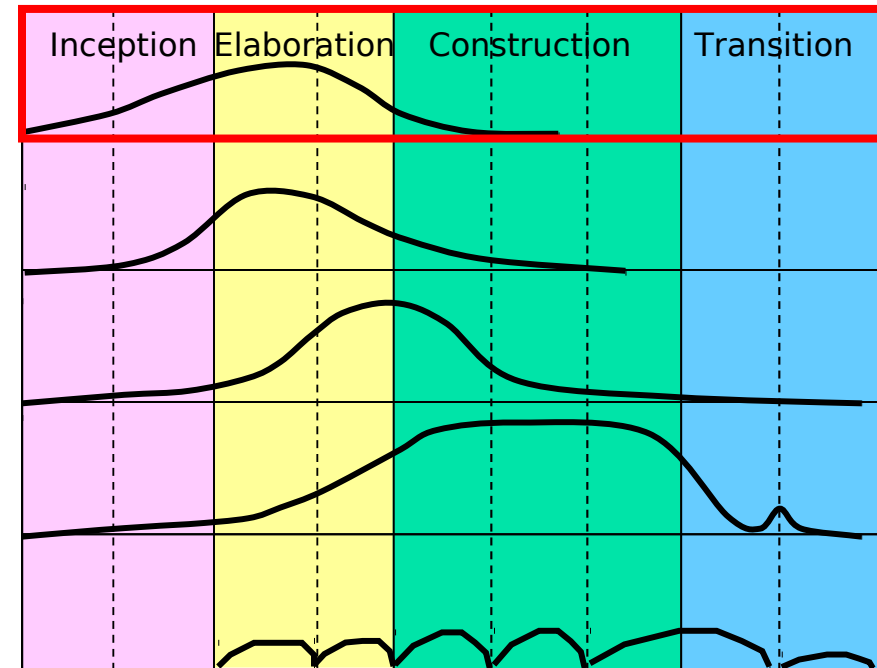
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Requirements - introduction
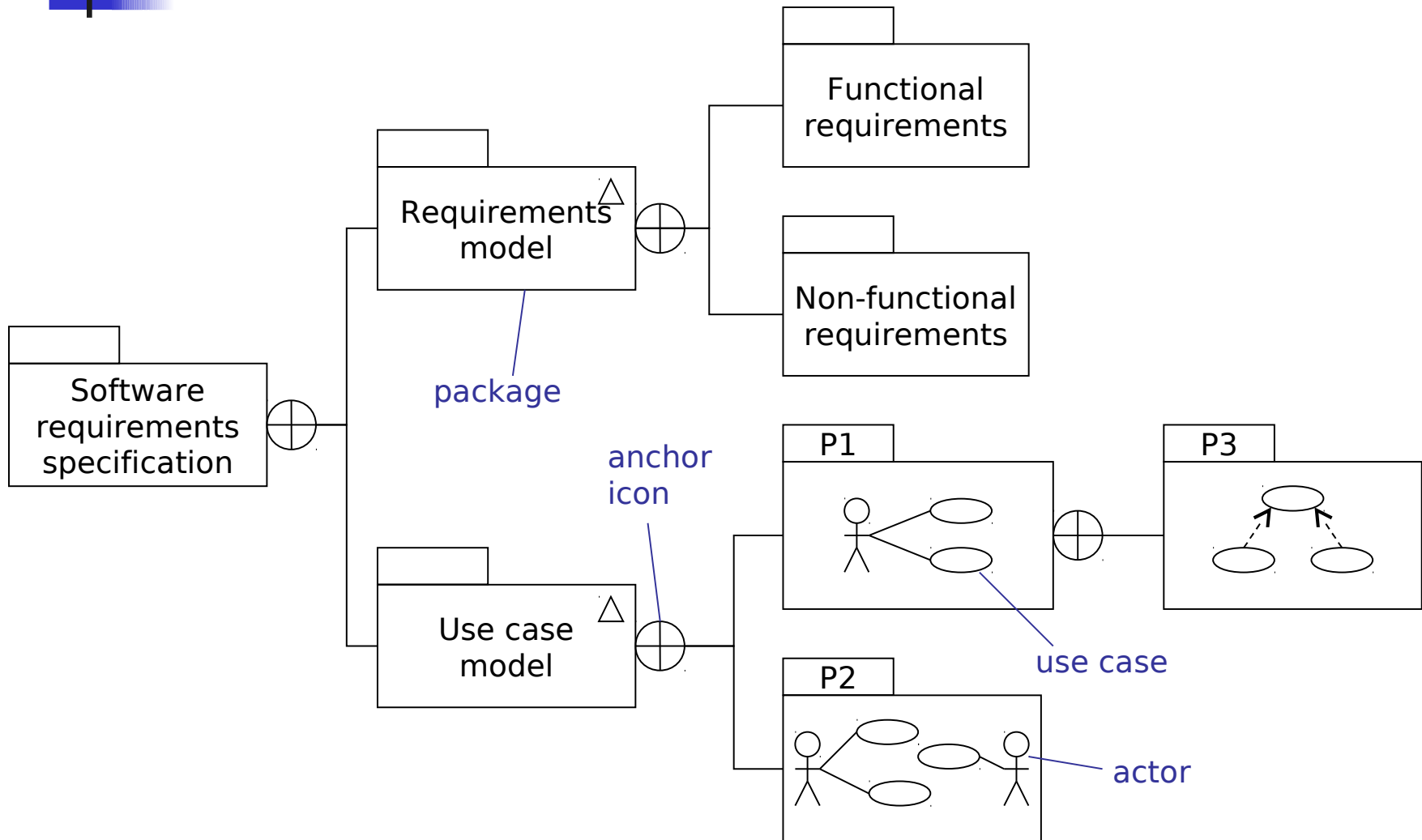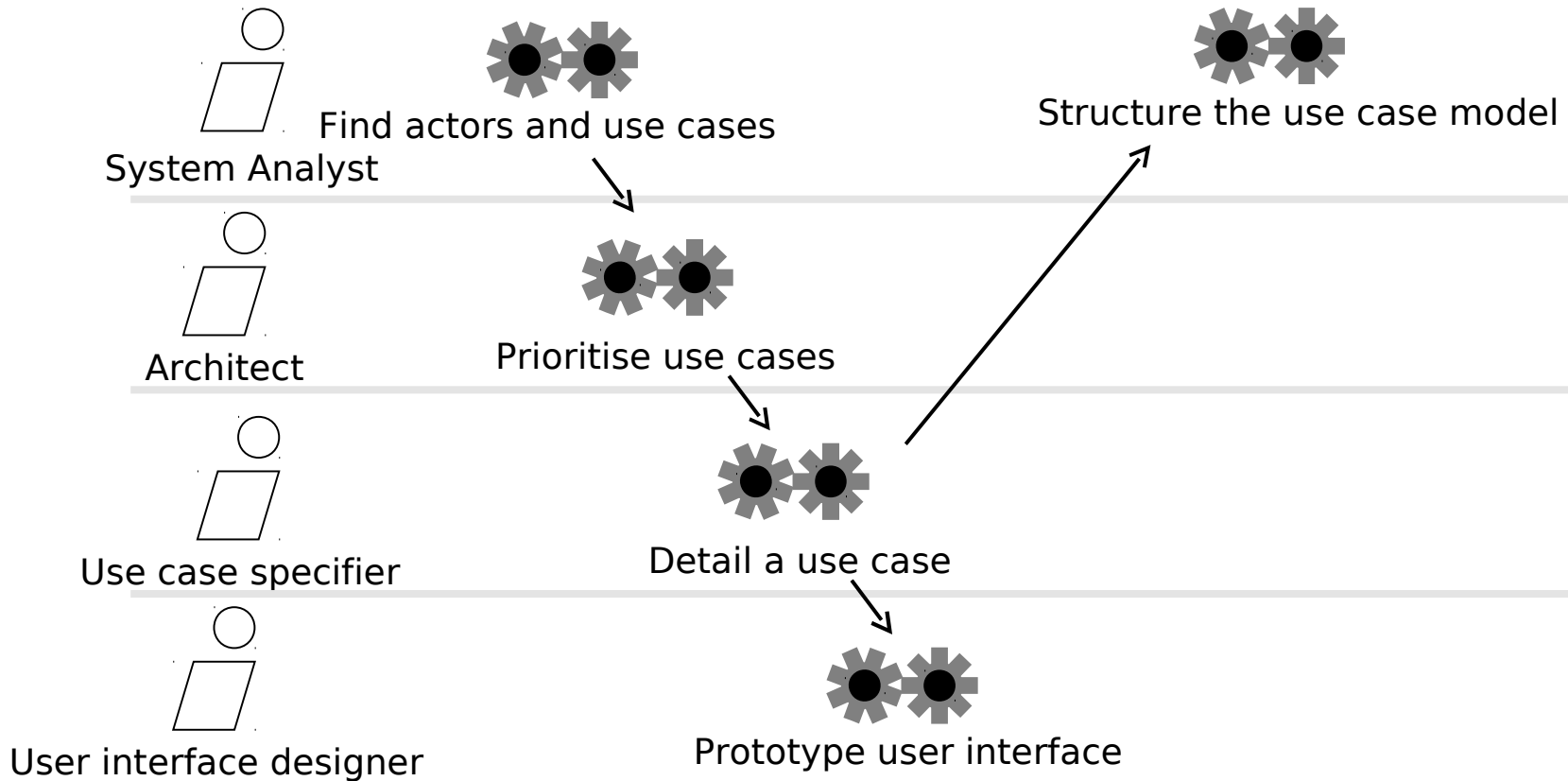
Requirements - purpose

- The purpose of the requirements workflow is to create a high-level specification of what should be implemented

- We interview the stakeholders to find out what they need the system to do for them – their requirements

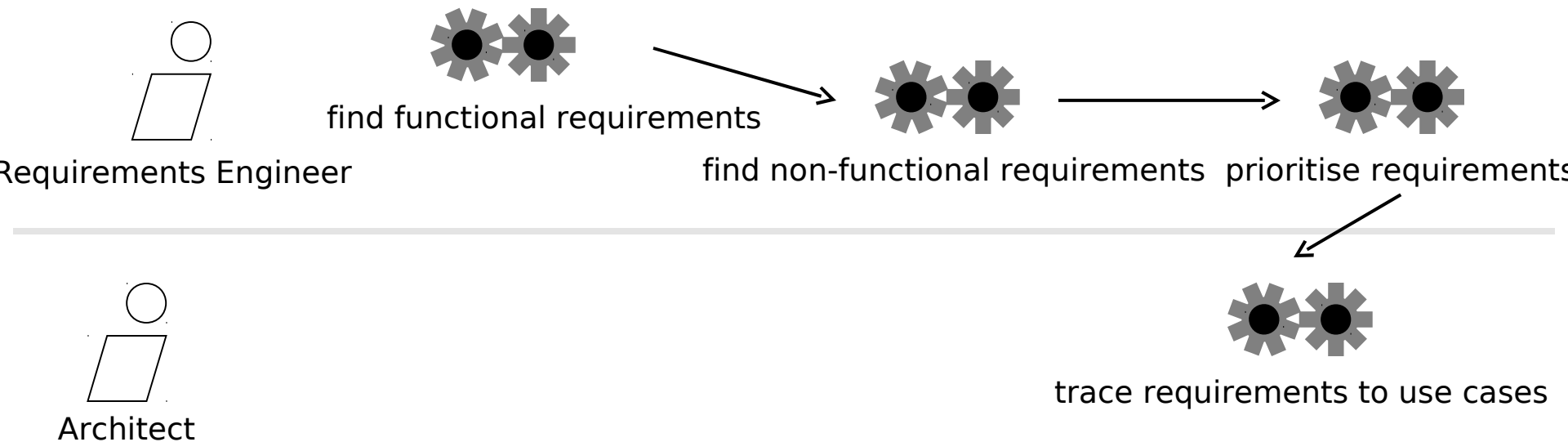| Inception	Elaboration	Construction	Transition

Requirements - metamodel

Functional requirements

Requirements model

Non-functional requirements

Software requirements specification

package

anchor icon

P1

P3

Use case model

use case

P2

actor

Requirements - workflow

System Analyst

Find actors and use cases

Structure the use case model

Architect

Prioritise use cases

Use case specifier

Detail a use case

User interface designer

Prototype user interface

We add...

find functional requirements

Requirements Engineer

find non-functional requirements   prioritise requirements

Architect

trace requirements to use cases
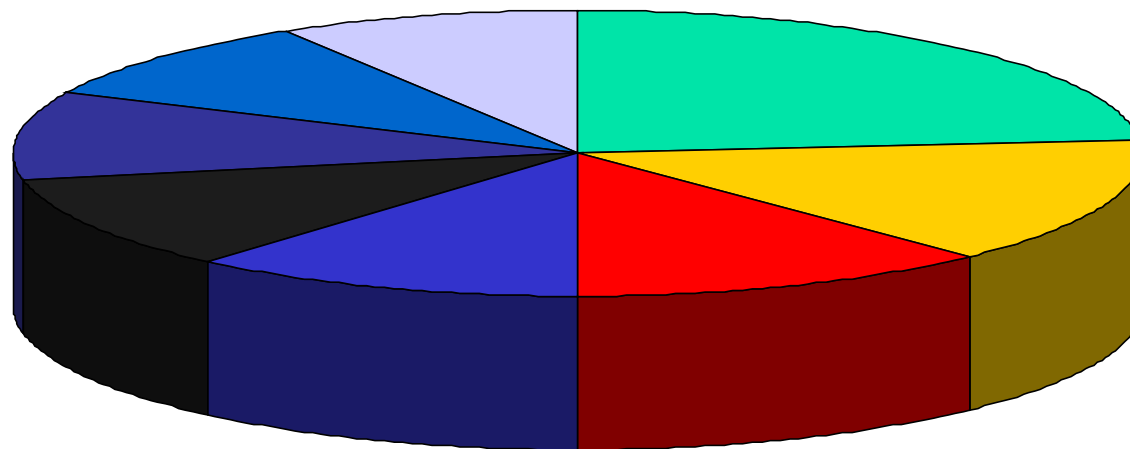
- In order to adopt a rigorous approach to requirements we need to extend the basic UP workflow with functional and non-functional requirements elicitation and requirements traceability

The importance of requirements

Project Failures

- Incomplete requirements
- Lack of user involvement
- Lack of resources
- Unrealistic expectations
- Lack of executive support
- Changing requirements
- Lack of planning
- Didn't need it any longer

Incomplete requirements are the primary reason that projects fail!

The Standish Group, "The CHAOS Report (1994) "

What are requirements?

- Requirements - "A specification of what should be implemented":
  - What behaviour the system should offer
  - A specific property of the system
  - A constraint on the system
- In UP we create a Software Requirements Specification (SRS)
  - The beginning of the OO software construction process it is a statement of the system requirements for all stakeholders
  - Organises related requirements into sections
- The SRS consists of:
  - Requirements model comprising functional and non-functional requirements
  - Use case model comprising actors and use cases

Writing requirements

<id> The <system> **shall** <function>

unique identifier   name of system   keyword   function to be performed

e.g. "32 The ATM system **shall** validate the PIN number."

- There is no UML standard way of writing requirements!
  - We recommend the uniform sentence structure above
- Functional Requirements - what the system should do
  - "The ATM system shall provide a facility for authenticating the identity of a system user"
- Non-functional Requirements - a constraint on how the functional requirements are implemented
  - "The ATM system shall authenticate a customer in four seconds or less"

The map is not the territory

- Everyone filters information to create their own particular model of the world. Noam Chomsky described this as three processes:
  - Deletion – information is filtered out
  - Distortion – information is modified by the related mechanisms of creation and hallucination
  - Generalisation – the creation of rules, beliefs and principles about truth and falsehood
- These filters shape natural language and so we may need to work to recover filtered information

these filters are applied automatically and unconsciously

Pracovní postupy

- Konzultace (interview)
  - Nemějte představy o řešení
  - Zadávejte otázky be kontextu
  - Naslouchejte
  - Nečtěte myšlenky
  - Mějte trpělivost
- Dotazníky
- Dílna požadavků

Summary

- We have seen how to capture:
  - Functional requirements
  - Non-functional requirements
- We have had a brief overview of the three filters which people use to construct their model of the world