

# COMP433: Software Engineering

## Requirements Engineering (/elicitations & Discovery!) (Chapter 4: Sommerville; Chapter 4: Bruegge)

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# – Software Requirements Specifications–

Descriptions and specifications of a system

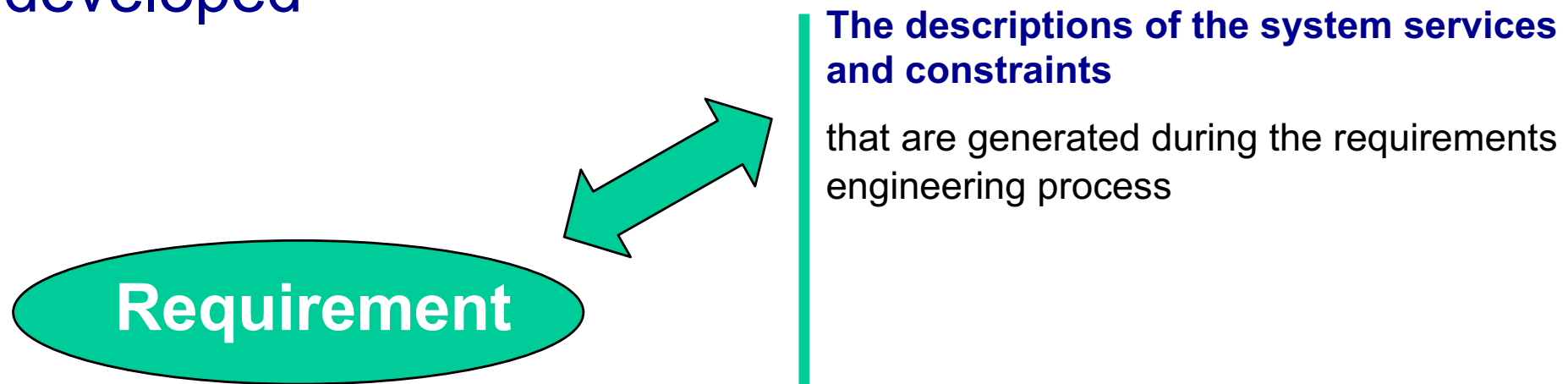
## Chapter objectives:

- To introduce the concepts of **user, domain and system requirements**
- To describe **functional / non-functional requirements**
- To explain **techniques** for describing system requirements
- To explain **how software requirements may be organised** in a requirements document
- To introduce some methods for **requirements discovery**

# Requirements engineering

Requirements engineering is the process of establishing

- the services (or functionalities) that the customer requires from a system
- the constraints under which it operates and is developed



# What is a requirement?

It may range from a **high-level** abstract statement of a service or of a system constraint to a **detailed mathematical functional specification**

This is inevitable as requirements may serve a **dual function**

May be the basis for a bid for a contract - **therefore must be open to interpretation**

May be the basis for the contract itself - **therefore must be defined in detail**

Both these statements may be called requirements

# Types of requirements

## User requirements

Statements in natural language [plus diagrams] of the services the system provides and its operational constraints. Written for **customers**

## System requirements

A structured document setting out detailed descriptions of the system services. Written for **customers**, and/or as a contract between **client (or customer)** and **contractor**

## Software specification

A detailed software description that can serve as a basis for a design or implementation. Written for **developers**

# User and system requirements

## User requirement definition

1. The MHC-PMS shall generate monthly management reports showing the cost of drugs prescribed by each clinic during that month.

## System requirements specification

1.1 On the last working day of each month, a summary of the drugs prescribed, their cost and the prescribing clinics shall be generated.

1.2 The system shall automatically generate the report for printing after 17.30 on the last working day of the month.

1.3 A report shall be created for each clinic and shall list the individual drug names, the total number of prescriptions, the number of doses prescribed and the total cost of the prescribed drugs.

1.4 If drugs are available in different dose units (e.g. 10mg, 20 mg, etc.) separate reports shall be created for each dose unit.

1.5 Access to all cost reports shall be restricted to authorized users listed on a management access control list.

# User requirements

**Should describe (functional and non-functional) requirements** so that they are understandable by system users who do not have detailed technical knowledge

**User requirements are defined using natural language, tables and diagrams** (will be discussed later)

# System requirements

- **More detailed specifications of user requirements**

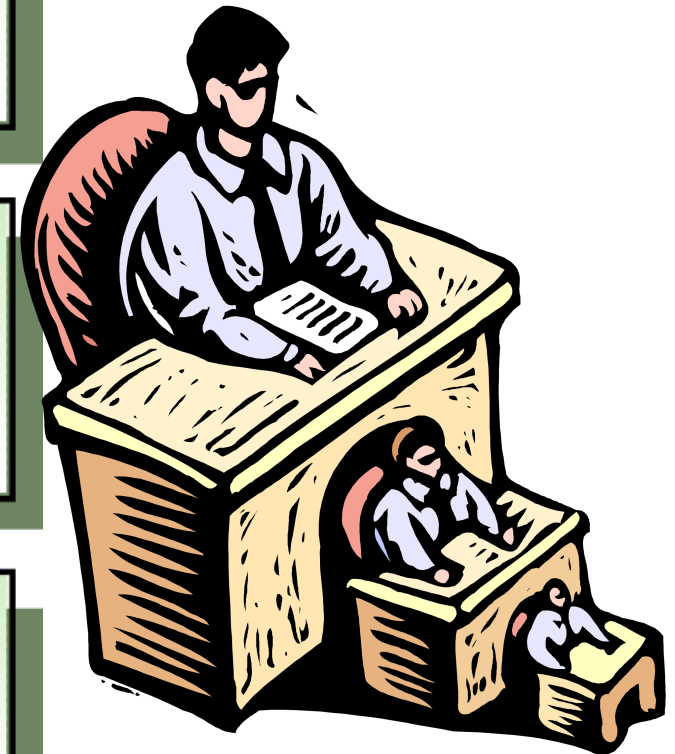
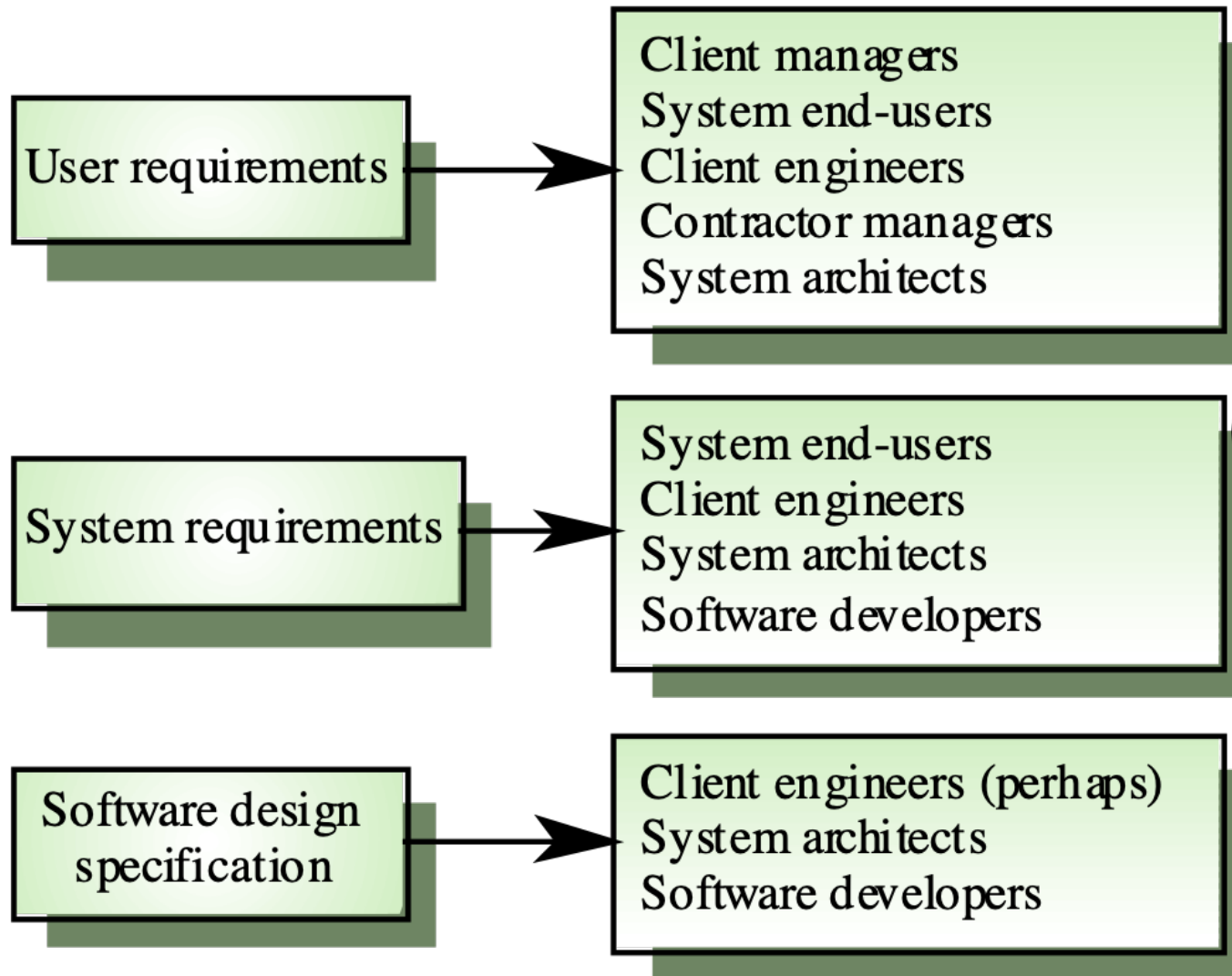
Serve as a basis for designing the system

May be used as part of the system contract

System requirements may be expressed using, **natural language** and **system models** (will be discussed in later lectures)



# Requirements readers



# Functional and non-functional requirements

## Functional requirements

Statements of services the system should provide, how the system should react to particular inputs and how the system should behave in particular situations.

## Non-functional requirements

constraints on the services or functions offered by the system such as timing constraints, constraints on the development process, standards, etc.

## Domain requirements

Requirements that come from the application domain of the system and that reflect characteristics of that domain-

Domain requirements can result into additional functional and non-functional requirements