

Software Engineering 2

lectures in english

Dr. Petr SPACEK¹

¹petr.spacek@fit.cvut.cz
Department of Software Engineering
Faculty of Informatics
Czech Technical University in Prague

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- 1 Intro
- 2 Requirements engineering
- 3 Software process
- 4 Project management, Proposals, estimations, project history, measurement
- 5 Development Environment
- 6 Build process & Configuration Management
- 7-9 Architecture+Design
- 10 Testing & Software Quality Assurance
- 11 Maintenance & Documentation

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There is the Final Test

Format 20 questions \Rightarrow max 100. points

Dates exam will be scheduled later

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The final grade will be given based on your score from the final test

F \leq 50 points

E $>$ 50 points

D $>$ 60 points

C $>$ 70 points

B $>$ 80 points

A $>$ 90 points

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- 1968: Conference on "software crisis".
- Delivery of software was sometimes years late.
- Its cost was often much higher than predicted.
- Many programs were unreliable.
- Maintenance of software tended to be difficult.
- The software often poorly performed the task for which it was designed.

⇒ The term "software engineering" was coined.

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Q: What is software engineering?

A: Software engineering is an engineering discipline which is concerned with all aspects of software production, for example, software specification, development, validation and evolution.

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Q: What is software engineering?

A: Software engineering is an engineering discipline which is concerned with all aspects of software production, for example, software specification, development, validation and evolution.

Q: What is the difference between software engineering and computer science?

A: Computer science is concerned with theory and fundamentals; software engineering is concerned with the practicalities of developing and delivering useful software.

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Problem no. 1: **Complexity**

- Software systems can include a huge number of functions and components.
- Many participants with usually different backgrounds participate in the development of software systems.
- Often no single person can understand the whole system.
- Sometimes systems become so hard to understand that they are never finished: "vaporware".

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Problem no. 2: **Change**

- Requirements are updated when errors are discovered and when developers get a better understanding of the application.
- Long-term projects involve high staff-turnaround.
- Often, important technological changes occur during the development of a software system.
- The client's needs may change during the development process.

⇒ It is impossible to specify a static set of requirements.

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Aspects of Software Engineering

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- **Modeling:** Focusing on the relevant parts of the system and ignoring everything else.
- **Problem solving:** Using models to find an acceptable – not necessarily an optimal – solution (“engineering = making things work”).
- **Knowledge acquisition:** Gaining sufficient knowledge about the problem domain and formalizing it to build a model.

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The following definitions follow those of the IEEE Standards on Software Engineering.

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Definition

A **project** is composed of a number of **activities** (or **phases**).
Each activity is in turn composed of a number of **tasks**

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A **project** is composed of a number of **activities** (or **phases**).
Each activity is in turn composed of a number of **tasks**

Definition

A task represents an atomic unit of work that can be managed.
It consumes **resources** and produces a **work product**.

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A **project** is composed of a number of **activities** (or **phases**).
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A task represents an atomic unit of work that can be managed.
It consumes **resources** and produces a **work product**.

Definition

A work product can either be a **system**, a **model**, or a **document**.

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Definition

A **project** is composed of a number of **activities** (or **phases**).
Each activity is in turn composed of a number of **tasks**

Definition

A task represents an atomic unit of work that can be managed.
It consumes **resources** and produces a **work product**.

Definition

A work product can either be a **system**, a **model**, or a **document**.

Definition

Resources are either **participants**, **time**, or **equipment**.

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Definition

All persons involved in a project (developers, project manager, client, end users, etc.) are referred to as **participants**.

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All persons involved in a project (developers, project manager, client, end users, etc.) are referred to as **participants**.

Definition

A **role** is a set of responsibilities in the project or the system.

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Definition

All persons involved in a project (developers, project manager, client, end users, etc.) are referred to as **participants**.

Definition

A **role** is a set of responsibilities in the project or the system.

Definition

A role is associated with a set of tasks and is assigned to a participant.

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Definition

All persons involved in a project (developers, project manager, client, end users, etc.) are referred to as **participants**.

Definition

A **role** is a set of responsibilities in the project or the system.

Definition

A role is associated with a set of tasks and is assigned to a participant.

Definition

The same participant can fill multiple roles.

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The term **system** refers to the underlying reality, and the term **model** refers to any abstraction of the reality.

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The term **system** refers to the underlying reality, and the term **model** refers to any abstraction of the reality.

Definition

A **notation** is a graphical or textual set of rules for representing a model. In this course, we will use UML (Unified Modeling Language) to represent models.

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The term **system** refers to the underlying reality, and the term **model** refers to any abstraction of the reality.

Definition

A **notation** is a graphical or textual set of rules for representing a model. In this course, we will use UML (Unified Modeling Language) to represent models.

Definition

A **method** is a repeatable technique for solving a problem.

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The term **system** refers to the underlying reality, and the term **model** refers to any abstraction of the reality.

Definition

A **notation** is a graphical or textual set of rules for representing a model. In this course, we will use UML (Unified Modeling Language) to represent models.

Definition

A **method** is a repeatable technique for solving a problem.

Definition

A **methodology** is a collection of methods for solving a class of problems.

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Software Specification: The process of understanding and defining requirements & constraints of the system being designed

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Software Specification: The process of understanding and defining requirements & constraints of the system being designed

There are 4 main activities

- Feasibility study
- Requirements elicitation and analysis
- Requirements specification
- Requirements validation

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Software design and implementation: The process of converting the system specifications into an executable system.

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Software design and implementation: The process of converting the system specifications into an executable system.

There are 5 main activities

- Architectural design
- Interface design
- Component design
- Database design
- Implementation

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Software validation: The process of verifying if a system both conforms to its specifications and meets the user expectations

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Software validation: The process of verifying if a system both conforms to its specifications and meets the user expectations

There are 3 main activities

- Development testing
- System Testing
- Acceptance Testing

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Evolution & maintenance: The process of systems' enhancement and optimization.

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Evolution & maintenance: The process of systems' enhancement and optimization.

There are 4 main activities

- The problem and modification analysis
- The modification design & implementation
- The acceptance of the modifications
- The migration process

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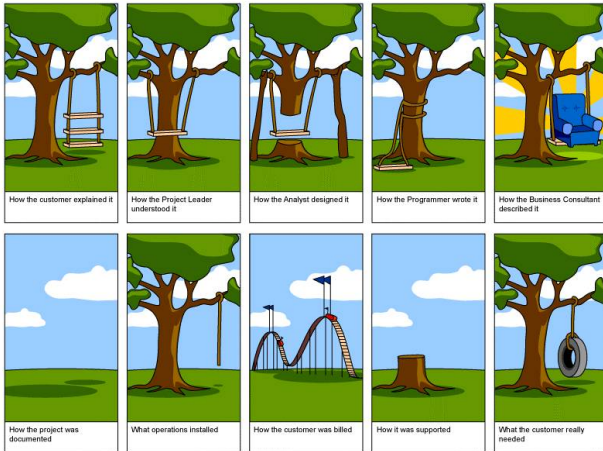
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