Introduction to Software Project Management

Lecture by Professor Vladimir Geroimenko

Module “Software Project Management“

11 October 2023 - Teaching Week 3

Textbook reference: Chapter 1

Lecture Outline

- What is a project? What is a software project?
- Activities of Software Project Management
- Life cycle of a software project
- Features and stakeholders of a software project
- Project objectives and goals
- Measuring effectiveness of a software project
- What is project management?
- Management Control Cycle

What is a project?

- **A project** is a piece of planned work or an activity that is finished over a period of time and intended to achieve a particular purpose. (Cambridge English Dictionary)

- Examples:
  - To build a new pyramid in Giza
  - To develop a new Augmented Reality game, similar to Pokémon Go

What is a project?

- **A project is a temporary enterprise undertaken to create a unique product, service or result.**

https://www.pmi.org/about/learn-about-pmi/what-is-project-management

Please note:

- A project is temporary
- A project is unique

General Characteristics of Projects -1/2

1. **Non-routine tasks** are involved
2. **Planning** is required
3. **Specific objective** are to be met **or a specific product** is to be created
4. The project has a predetermined (= fixed) **time span** (= duration)
5. Work is carried out **for someone other** than yourself
6. Work involves several **specialisms**
7. People are formed into a **temporary work group** to carry out the task

General Characteristics of Projects – 2/2

8. Work is carried out in several **phases**
9. The **resources** that are available for use on the project are constrained (=limited)
10. The project is **large or complex**

Specific Characteristics of Software Projects – 1/2

Software projects versus other types of project:

- Many techniques in **general project management** also apply to software project management.
- But there are some **specific characteristics of software projects** which make them particular difficult.

Specific Characteristics of Software Projects – 2/2

- **Invisibility.** With software, progress is not immediately visible (not like, for example, with constructing a pyramid).
- **Complicity.** Software contain more complexity than other engineered products (per dollar/pound/euro spent)
- **Conformity.** Traditional projects deal with cement, steel etc and consistent physical laws. Software project have to conform to the requirements of human clients (that sometimes have no idea…)
- **Flexibility.** In a system, software components are particularly subject to change (rather than other ones – physical or organisational)

Activities of Software Project Management – 1/3

1. Feasibility Study (Project Initiation)

- (In English: feasibility = possibility, achievability)
- Whether a project is **worth starting** (= there is a valid *business case)*
- Usually, **the aims** are clear but not **the means** of their achievement
- What are the **requirements** of the proposed application?
- What are the developmental and operational **costs**?
- What are the **value and** the **benefits** of the new system?
- *Please note: With a large system, the feasibility study could be a project in its own right with its own plan and execution*

Activities of Software Project Management – 2/3

2. Planning

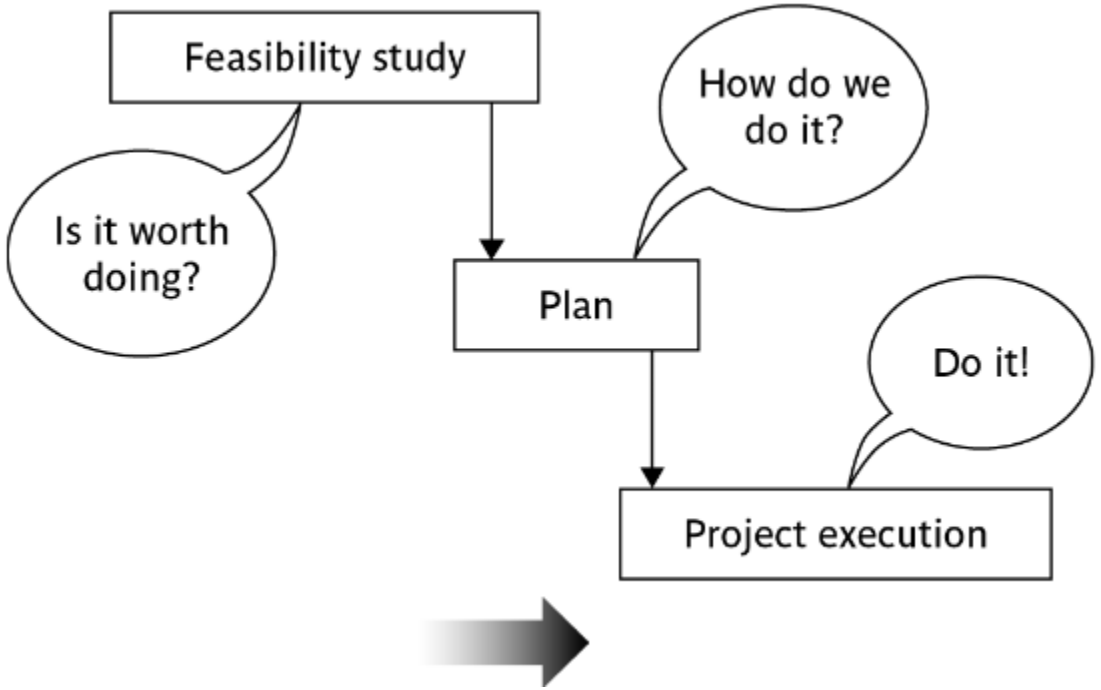
- For a large project, no detailed planning at the beginning. Only an outline plan for the whole project and a detailed one for the first stage.

3. Project Execution

- Usual sub-phases: *design* and *implementation*
- Design is making decisions about the form of the product, such as the user interface or the internal architecture.

Activities of Software Project Management – 3/3

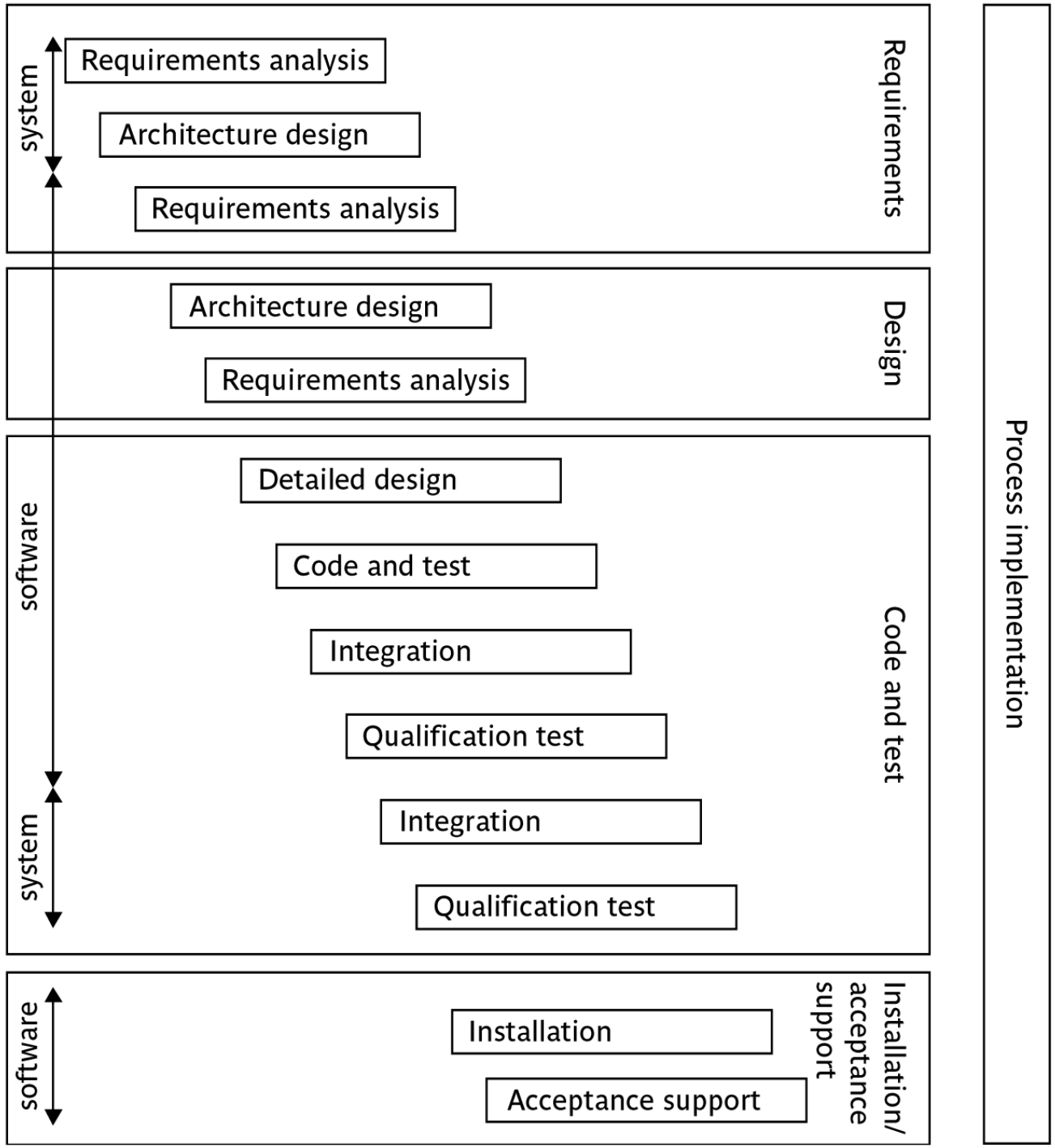
A visual summary:



The ISO 12207 Software Development Life Cycle

Notes to the next slide:

- ISO = International Standards Organisation
- **Software requirement vs System requirement:** An example of a system requirement – Training of the users how to use the computer system efficiently.
- Some components of the new system could be not only software, but new hardware or work processes.
- Acceptance support = maintenance and enhancement


Requirements analysis
Architecture design
Requirements analysis
system
Requirements
Architecture design
Requirements analysis
Design
Detailed design
Code and test
Integration
Qualification test
Integration
Qualification test
software
system
Code and test
Installation
Acceptance support
software
Installation/
acceptance
support
Process implementation

Distinguishing Features of Software Projects

Compulsory versus voluntary users

- For example, a system for recording a sale (precise requirement) versus a computer game (vague requirements).

Information systems versus embedded systems

- Information systems enable people to do some job, embedded systems control machines (e.g. AC equipment in a building).

Objectives versus products

- Project may aim at producing a product or at meeting certain objectives (e.g. an organisation might have a problem and ask a specialist to recommend a solution).

Stakeholders of a Software Project

Stakeholders are people who have a stake (= invested money) or interest in the project. They can be:

- Internal to the project team.
- External to the project team but within the same organisation.
- External to both the project team and the organisation.

Different types of stakeholder may have different objectives. The project manager needs to be a good communicator and negotiator and should try to make all of them happy. Good practice is to create a ***communication plan*** at the start of a project.

Objectives

Objectives focus on the desired outcomes of the project, for example: “customers will be able to order our products online”

Good objectives must be SMART:

S - Specific (= concrete and well defined)

M – Measurable (e.g. “to reduce customer complaints”)

A – Achievable

R – Relevant (to the true purpose of the project)

T – Time constrained (e.g. “by 1 February”)

Sub-Objectives and Goals

- In order to achieve the objective, we must achieve certain **goals** or **sub-objectives** first.
- They are steps on the way to achieving an objective.
- *For example:* In football, the objective is to win a football match, and the goals scored in the match are steps towards to the objective.

Measures of Effectiveness

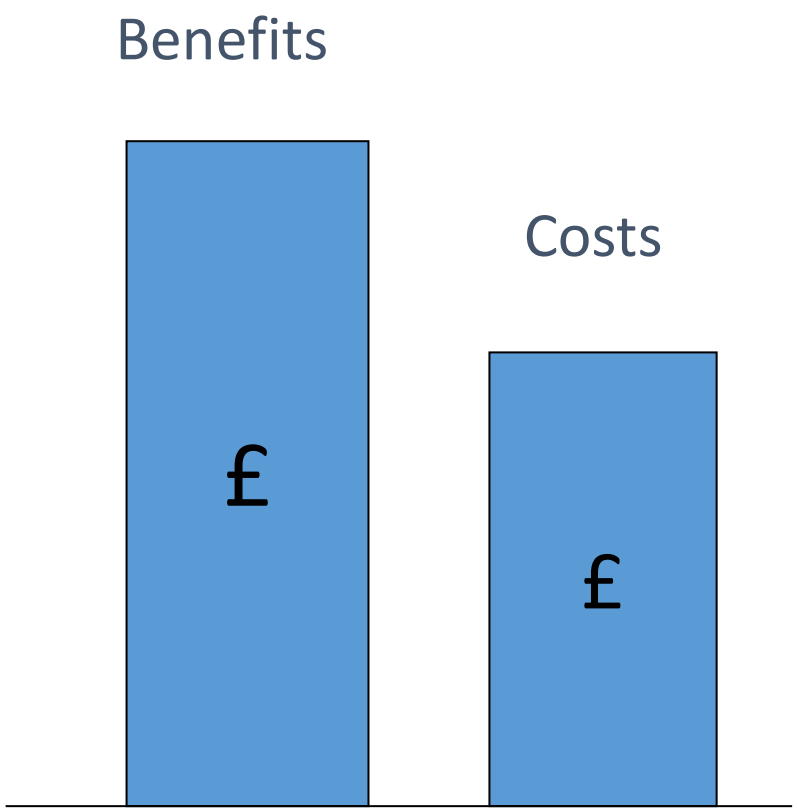
How do we know that the goal or objective has been achieved?

By a practical test, that can be objectively assessed.

For example, for user satisfaction with software product:

- Repeat business – they buy further products from us
- Number of complaints – if low

The Business Case



Benefits of delivered project must outweigh costs

Costs include:

- Development
- Operation

Benefits

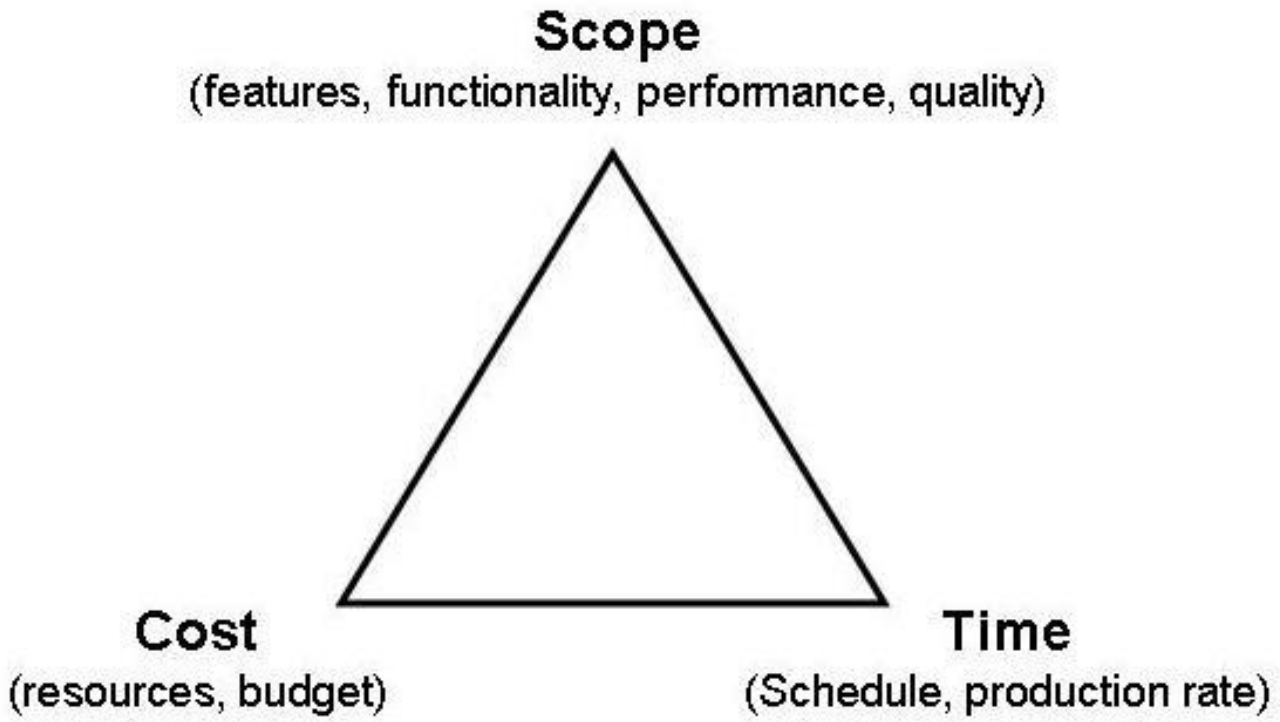
- Quantifiable
- Non-quantifiable

Project Success and Failure

- Agreed functionality implemented
- Required level of quality achieved
- On time
- Within budget

Please note: Project objectives vs. business objectives

Project Success or Failure – Project Triangle



If, for example, project is running out of time, this can be recovered for by reducing scope or increasing costs. Similarly costs and scope can be protected by adjusting other corners of the project triangle.

Other Success Criteria

These can relate to longer term, less directly noticeable assets:

- Improved skill and knowledge
- Creation of assets that can be used on future projects e.g. software libraries
- Improved customer relationships that lead to repeat business

Finally, What is Management? – 1/3

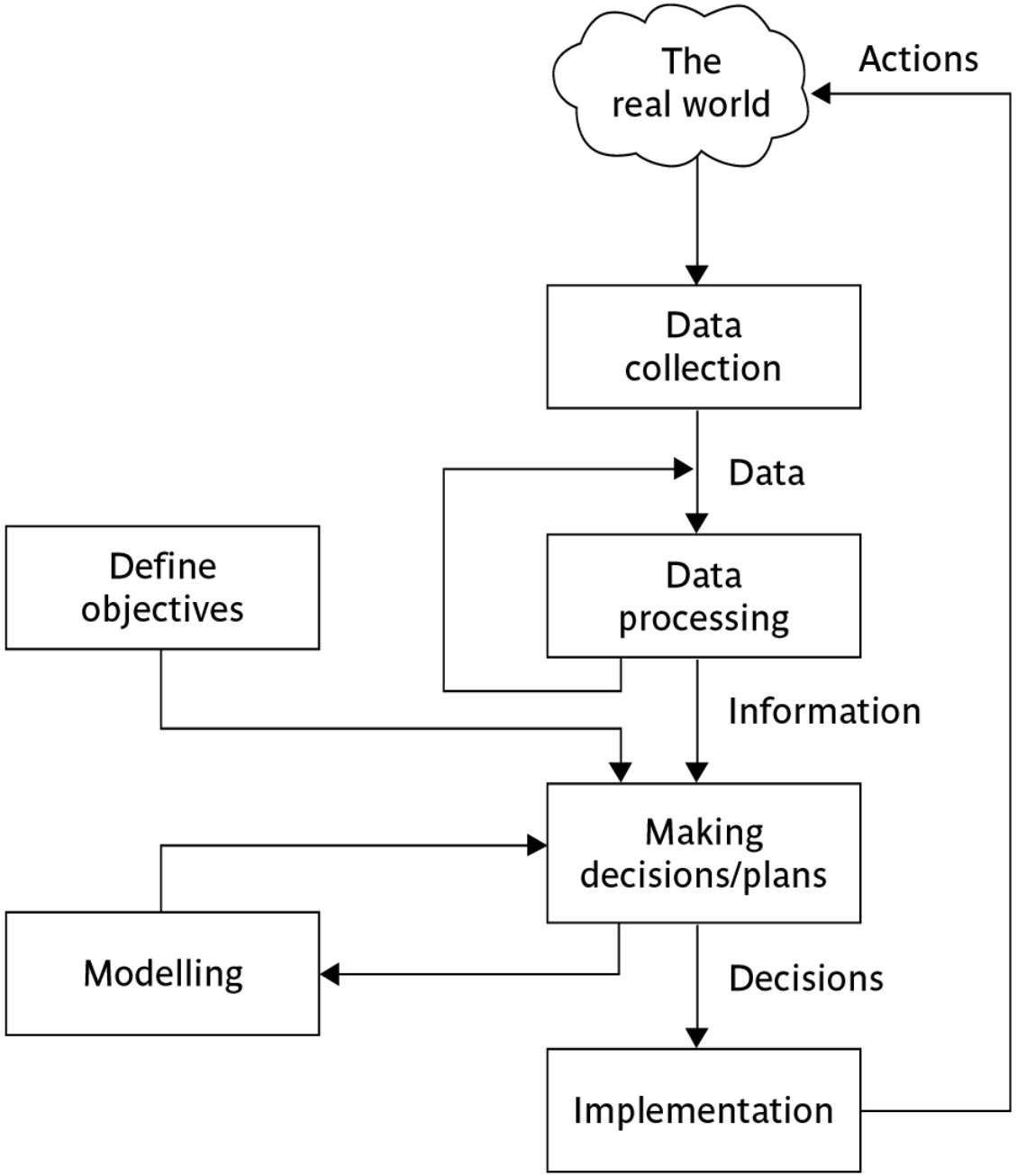
Management involves the following activities:

- Planning – deciding what is to be done
- Organizing – making arrangements
- Staffing – selecting the right people for the job
- Directing – giving instructions

What is Management? – 2/3

- Monitoring – checking on progress
- Controlling – taking action to remedy hold-ups
- Innovating – coming up with solutions when problems emerge
- Representing – liaising with clients, users, developers and other stakeholders

Management Control Cycle



Thank you for your attention

Any questions, please?