

Project management

What is project management?

Project

“A temporary venture that exists to produce a defined outcome that leads to the achievement of intended benefits (value)” (Axelos / PRINCE2®)

Project types

- SW / IT projects - include SW development
- ! But also construction projects, engineering projects, transport projects, research projects,
- ! But also personal projects (e.g., writing a master thesis)

Project management

“The discipline of applying specific processes and principles to initiate, plan, execute and manage the way that new initiatives or changes are implemented within an organization.” (Axelos / PRINCE2®)

SW / IT projects

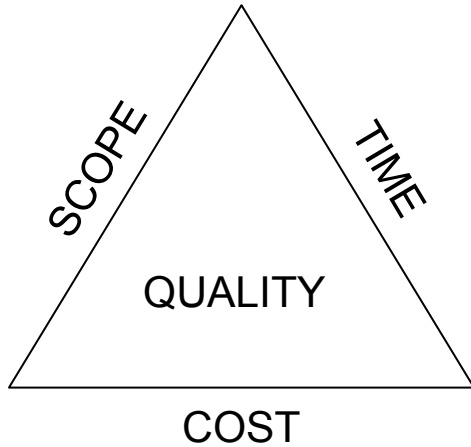
“New” project type (~100 years of IT vs thousands years of e.g., construction)

+ IT projects often take place in a dynamic environment - they must quickly adapt to innovations and rapid technological changes

Common problems

- Unclear project visions and business goals
- Too ambitious scope with respect to the resources and deadlines
- Insufficient requirements traceability
- Inadequate planning and poor risk management
- Poor communication (both internal and external)
- ...

Project management triangle



- Three constraints of the quality of work
- The project manager can trade between constraints
- Changes in one constraint necessitate changes in others to compensate or quality will suffer

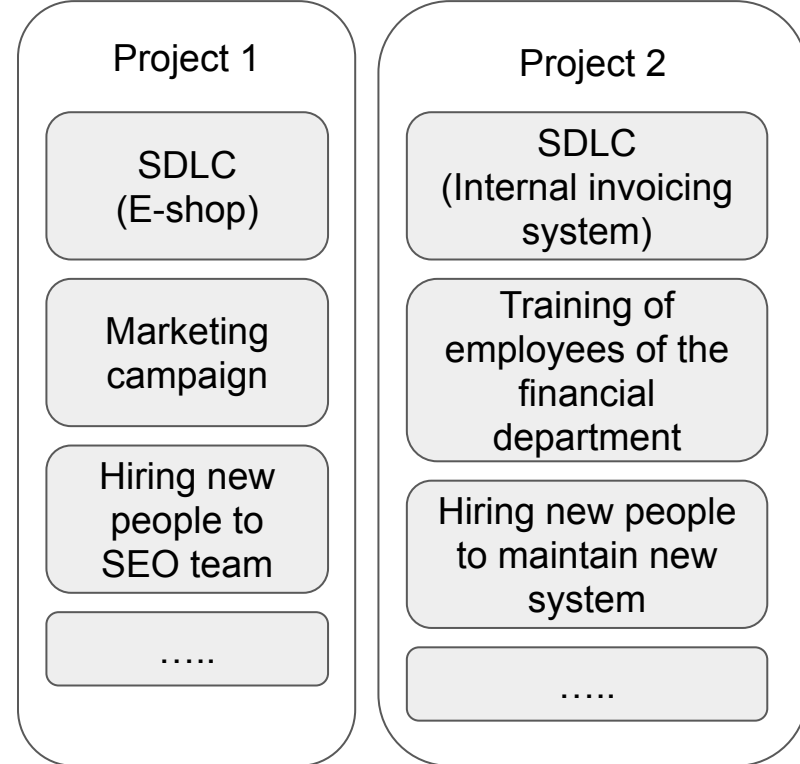
Project vs process

Software development process (also known as SDLC)

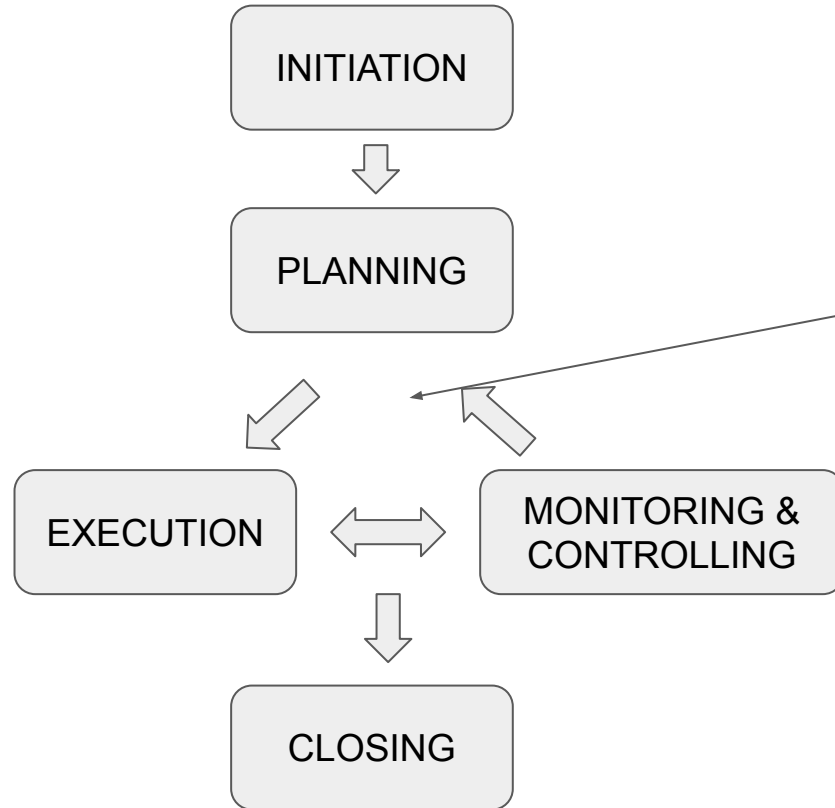
- A structured set of activities that aims to design, create, test, and maintain software and systems
- The process is applied repeatedly during different projects (although various methodologies can be used)

SW / IT project

- One-time, temporary organisational activity
- Typically broader initiative, may have various goals, requirements, and deliverables beyond just creating software
- Includes also (a part of) SDLC in some form - depending on the chosen methodologies

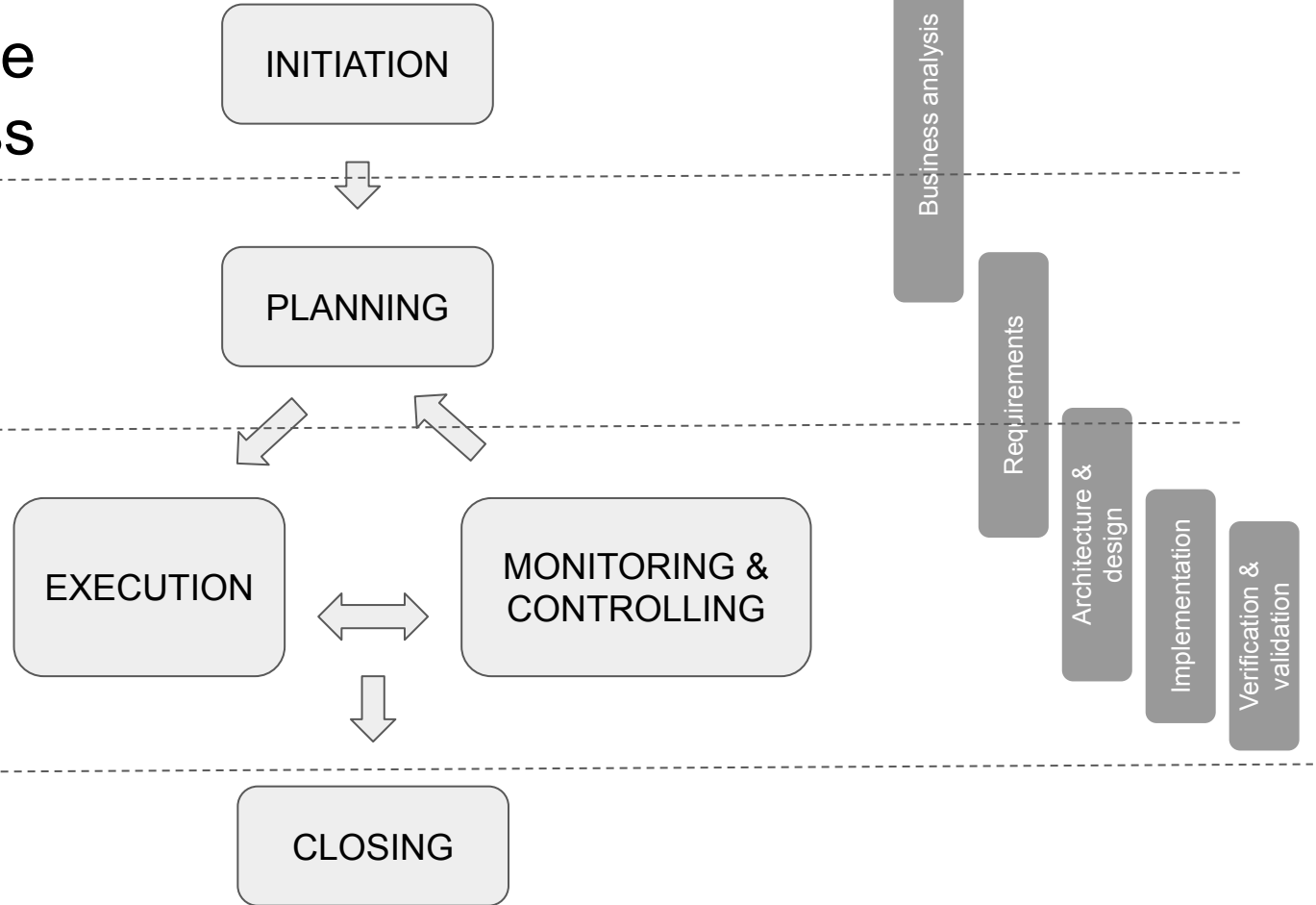


Project lifecycle



Between the planning and the execution phase, a project kick-off meeting typically takes place

Project lifecycle vs. SW process

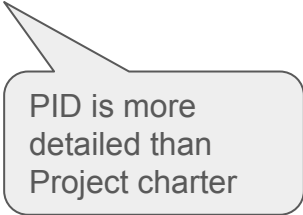


Project lifecycle vs SDLC

- Business analysis (BA) overlaps with project initiation
 - BA is rather a continuous activity within the organization and at some moments specific projects are initiated based on the results of BA
- Requirements phase typically starts already during project initiation and continues throughout planning and execution
 - Different people may be responsible for different levels of requirements
- Design & architecture, implementation, verification & validation phases typically fall under project execution
 - Some work can be done earlier, i.e. in feasibility studies
- Maintenance is typically covered by separate project(s)

Project initiation

- An initial document is created that authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities
- Form of the initial document:
 - Project Initiation Document (PID)
 - Project Charter
 - ...
- Supporting documents:
 - Business Case
 - Cost and benefits analysis
 - Feasibility studies
 - ...



PID is more detailed than Project charter

Project charter - typical content ([example](#))

- Project title and description
- Project manager, project sponsor + other key stakeholders
- Project purpose
- Project scope and business requirements (goals)
- Risks, constraints, assumptions, dependencies
- High-level timeline & budget
- Project success criteria
- Approval and sign-off

Project planning

Project plan

"...a statement of how and when a project's objectives are to be achieved, by showing the major products, milestones, activities and resources required on the project." (PRINCE2)

It typically contains

- Scope statement
- Task identification
- Project schedule
- Budget
- Risk management plan
- Quality plan
-

Traditionally, the planning was done only once for the entire project. However, iterative approaches enter the planning phase more than once.

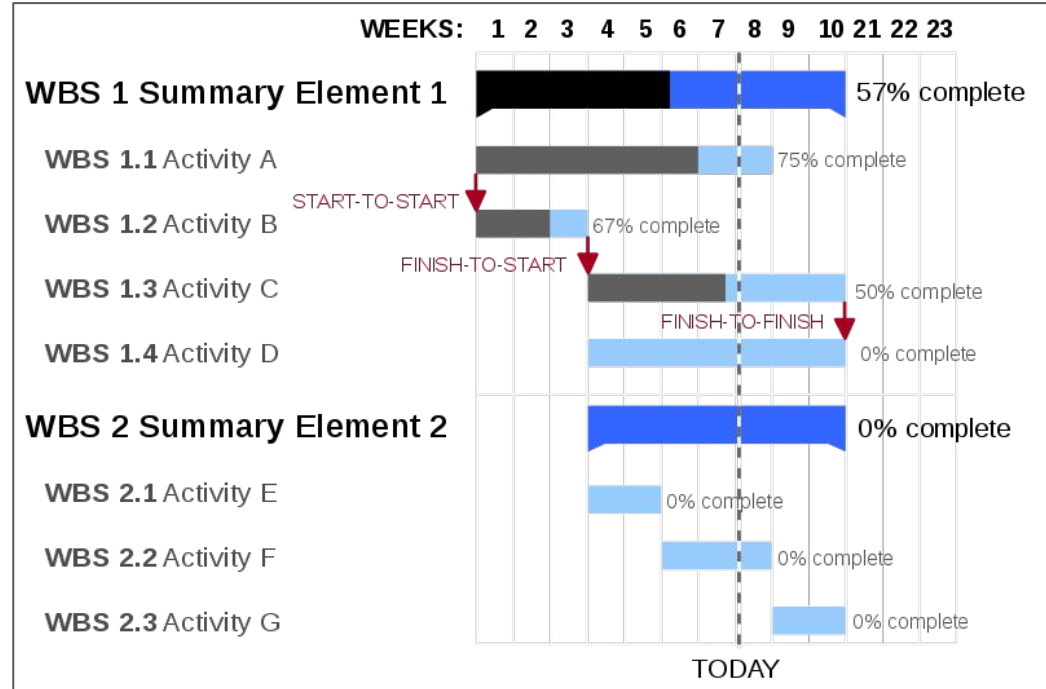
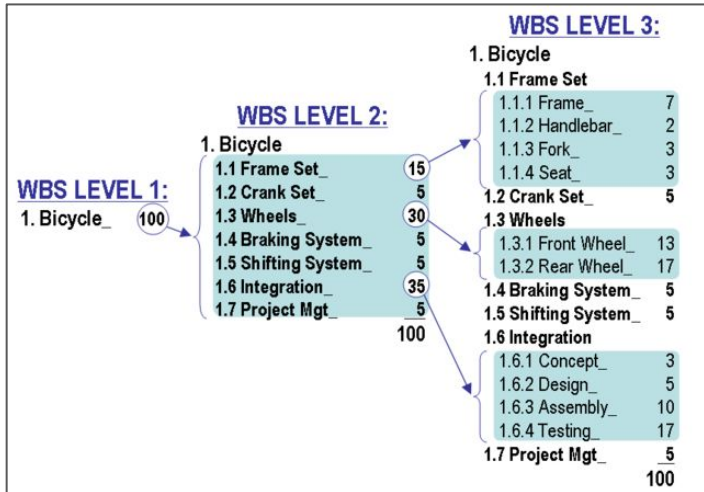
Project planning - methods

Work Breakdown Structure (WBS)

- Task identification

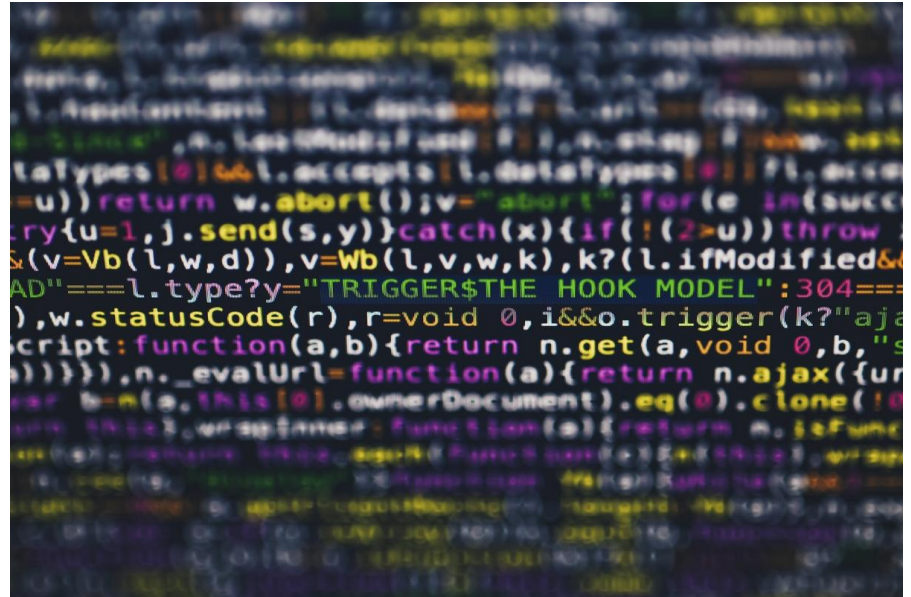
Gantt charts

- Project schedule, dependencies, current status



Project execution

- It usually starts with a kick-off project meeting
- **Direct work:**
 - The project team starts actively working on project tasks and activities as defined in the project plan
- **Reporting:**
 - Progress reports, status updates, and other relevant information are shared with stakeholders
- **Quality Assurance:**
 - Quality control measures are implemented



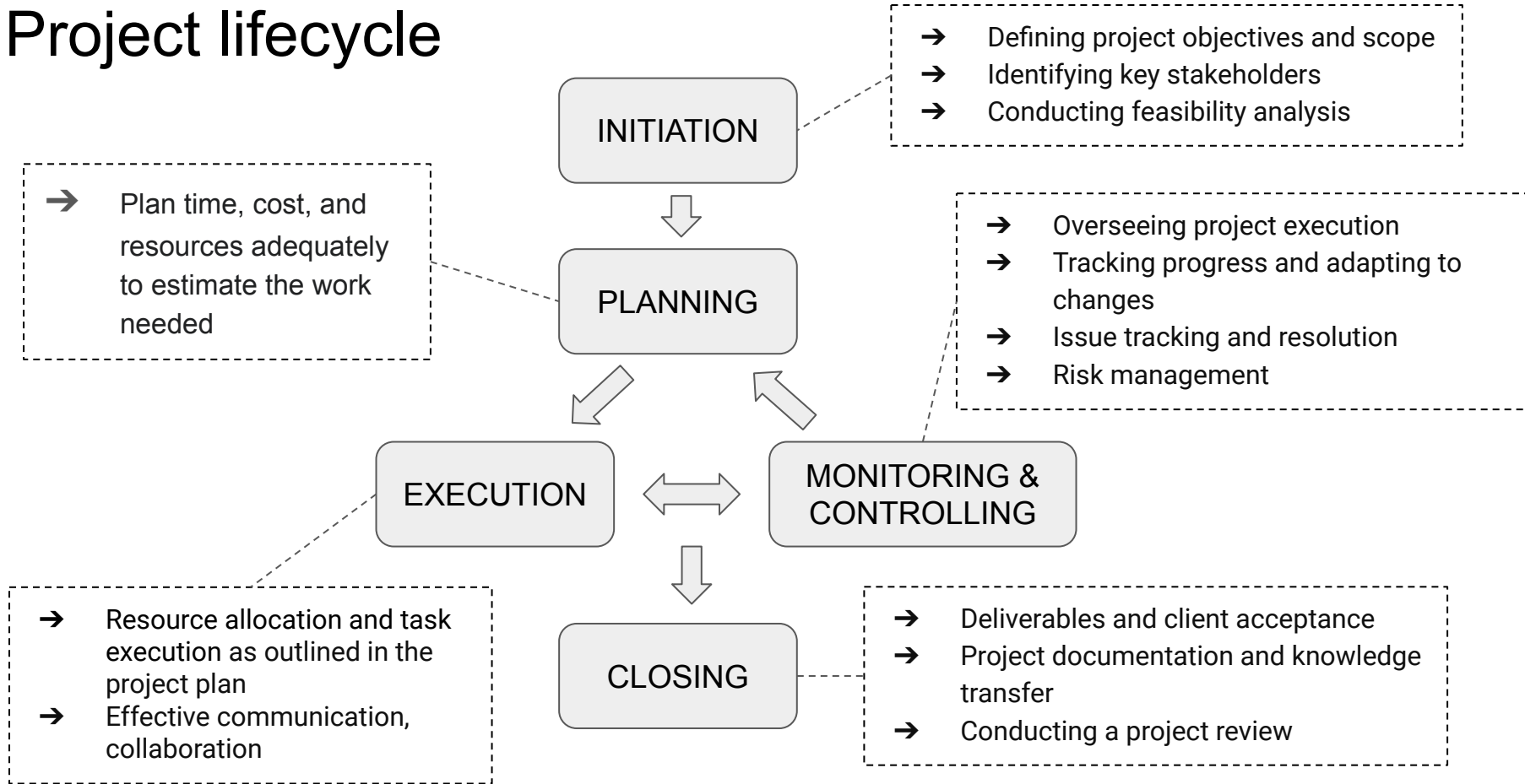
Project monitoring and controlling

- Occurs concurrently with the Execution phase
- Iterative phase
- Performance monitoring
 - Monitor and measure project performance against the baseline established in the project plan
- Quality / schedule / cost control
- Risk management
 - Monitor identified risks, identify new risks, apply mitigation strategies
- Issue resolution
 - Identify and resolve issues or conflicts that may hinder project progress
 - Escalate issues to higher levels of management if necessary
- Change management
 - Assess and manage changes to the project scope or other aspects

Project closing

- Final Deliverable Acceptance:
 - Ensure that all project deliverables have been completed and meet the acceptance criteria defined in the project plan.
 - Obtain formal acceptance from the project stakeholders.
- Closure of projects contracts
- Knowledge Transfer:
 - Document and transfer knowledge gained during the project to relevant individuals or teams within the organization.
- Post-Implementation Review:
 - Evaluate the project's overall performance against the original goals and objectives.
 - Assess the success criteria and identify areas for improvement.

Project lifecycle



Project manager role

- Project manager is typically assigned to the project at the beginning of the initiation phase
- Responsible for all phases of the project lifecycle
- In some organizations, project manager can serve also as a people manager
 - Project manager serves as the direct line manager of the project team members
 - E.g. in case of projectized organizational structure

Software tools for project management

- MS Project
- Jira
- Trello
- Asana
- Smartsheet
- ...

Some of them provide issue tracking directly, other support integration with issue tracking SW

Version control systems help a lot

- Git + web based platforms such as GitHub, Bitbucket

Methodologies

Traditional / sequential methodologies

- Waterfall
- Critical Path Method (CPM)

PMBOK (by Project Management Institute)

- A set of standards

Agile approaches

- Pure Agile
- Scrum
- Kanban
- Extreme Programming (XP)
- Feature-driven development
- SAFe (Scaled Agile Framework)
- ...

Process oriented

- Lean management
- Six sigma
- ...

Other

- Prince2 (Projects IN Controlled Environments)
- ...

Resources and further reading

- Axelos (Certification PRINCE2): [What is Project Management?](#)
- Wikipedia - [Project Management](#)
- Wikipedia - [Project Management Triangle](#)
- Wikipedia - [Work Breakdown Structure](#)
- Wikipedia - [Gantt chart](#)