

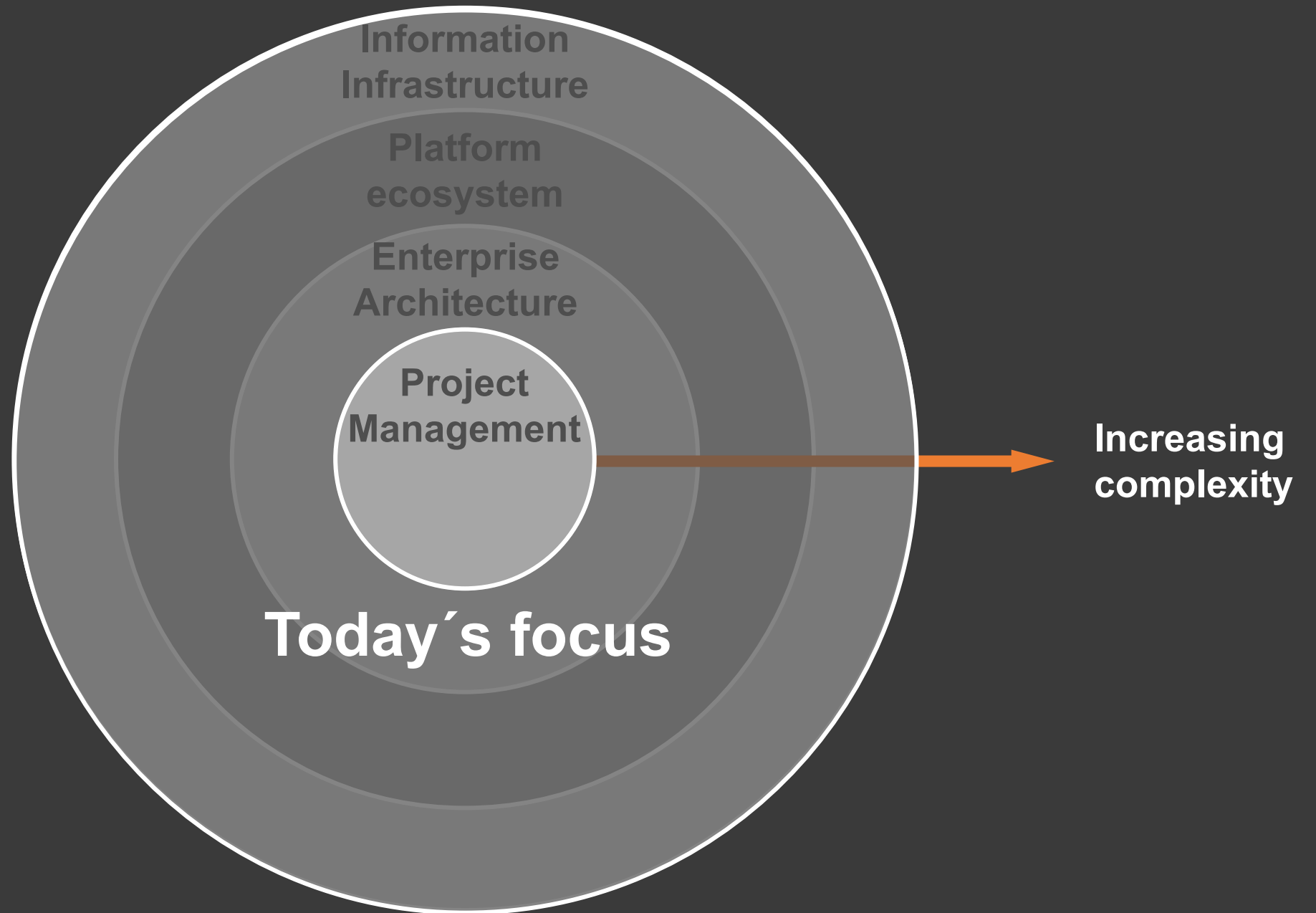
Project Management

Ivar Hukkelberg, 30th March 2020

Who am I?

- M.Sc. Industrial Economics at NTNU
- Two years as a consultant at Accenture
- PhD candidate - Machine learning in public sector
- Spare time activity - impro theater and acting





Key take-aways should be...

①

**What is Project
Management?**

②

**Waterfall
approach**

③

**Agile
approach**



What is a project?



Ivar Hukkelberg (2020)

Photo by [Startup Stock Photos](#) from [Pexels](#)

Characteristics of what a project is

- Has a start and an end
- Has an organization and steering committee
- Has a clear mandate and goals for what to produce
- Has a defined plan of activities, budget, and schedule

“A project is a temporary endeavor undertaken to create a unique product, service, or result.” – PMI Book



Why organize activities as a project?

Solve complex tasks that the line organization is not designed to do.

Examples of such tasks:

- Developing a new product or service
- Effecting a change in the structure, staffing, or style of an organization
- Constructing a building or infrastructure
- Implementing a new business process or procedure



Project management?



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EVERY GROUP PROJECT



What is project management?

”The application of knowledge, skills and techniques to execute projects effectively and efficiently” - PMI Book

Managing a project typically includes:

- Identifying requirements
- Stakeholder management
- Balancing different project constraints, such as:
Scope, quality, schedule, budget, risk, etc.



The standard (PMI) project management approach



**Global nonprofit
professional
organization for
project management**


**Standardized way on
how to do project
management**



Project life cycle

PMI is process-oriented

Four phases:

-  Initiating
-  Planning
-  Executing
-  Closing

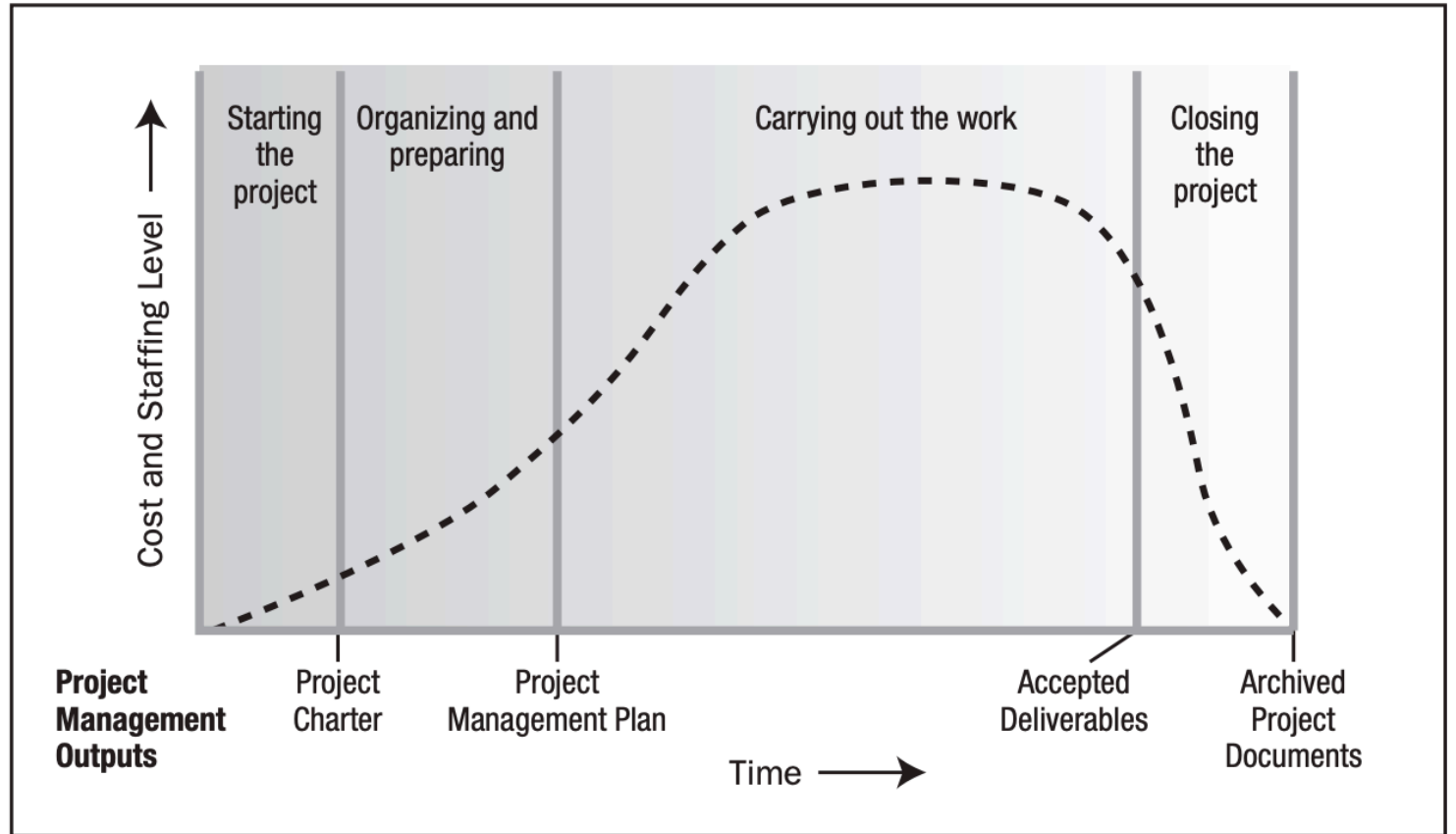


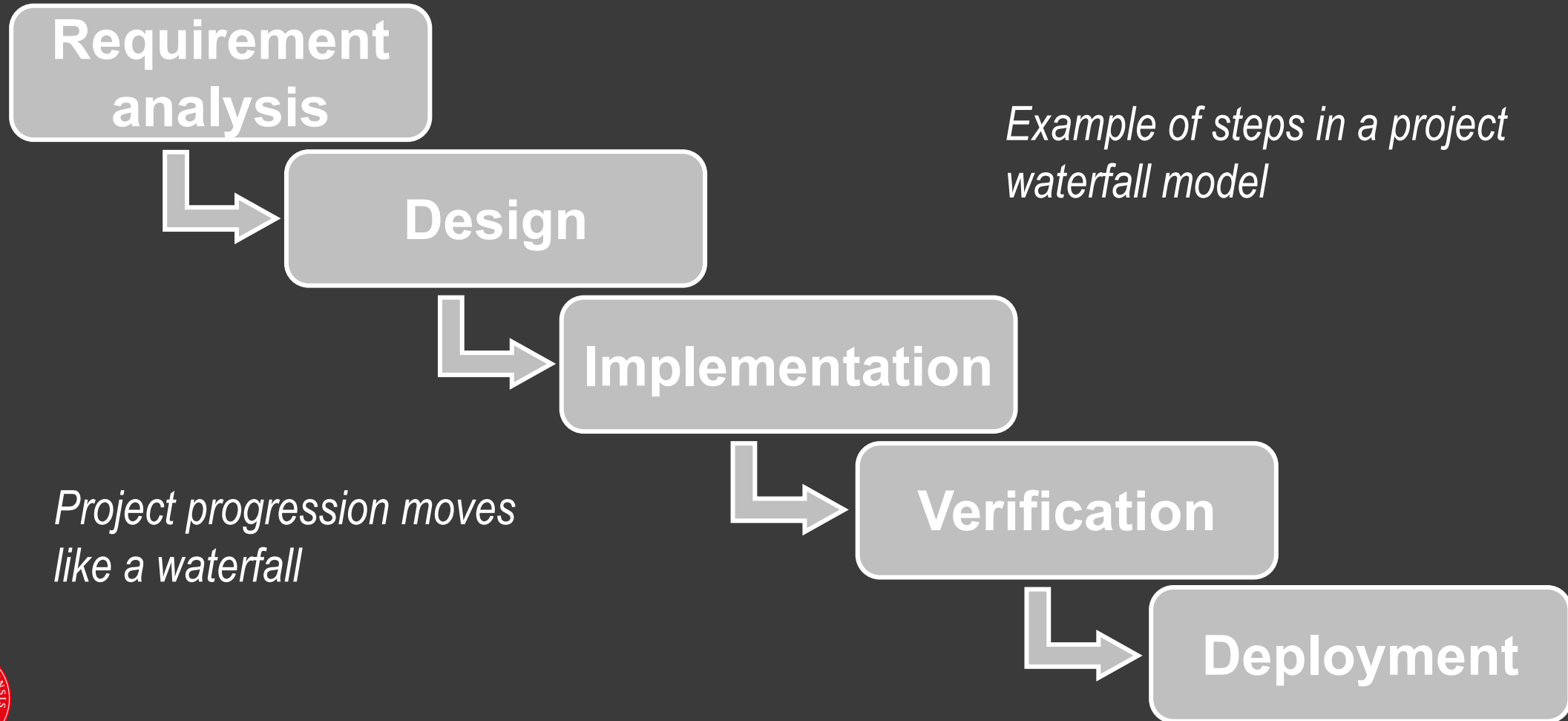
Figure 2-1. Typical Cost and Staffing Levels Across the Project Life Cycle

Source: PMI Book

Ivar Hukkelberg (2020)



The standard project model is often called the “Waterfall model”



Stakeholder management

Persons or organizations who are actively involved in the project, may be affected by the performance or completion of the project, or can exert influence over the project.

Exercise

Use 2min to write down the stakeholders in your group project. How is the stakeholders connected to the project?

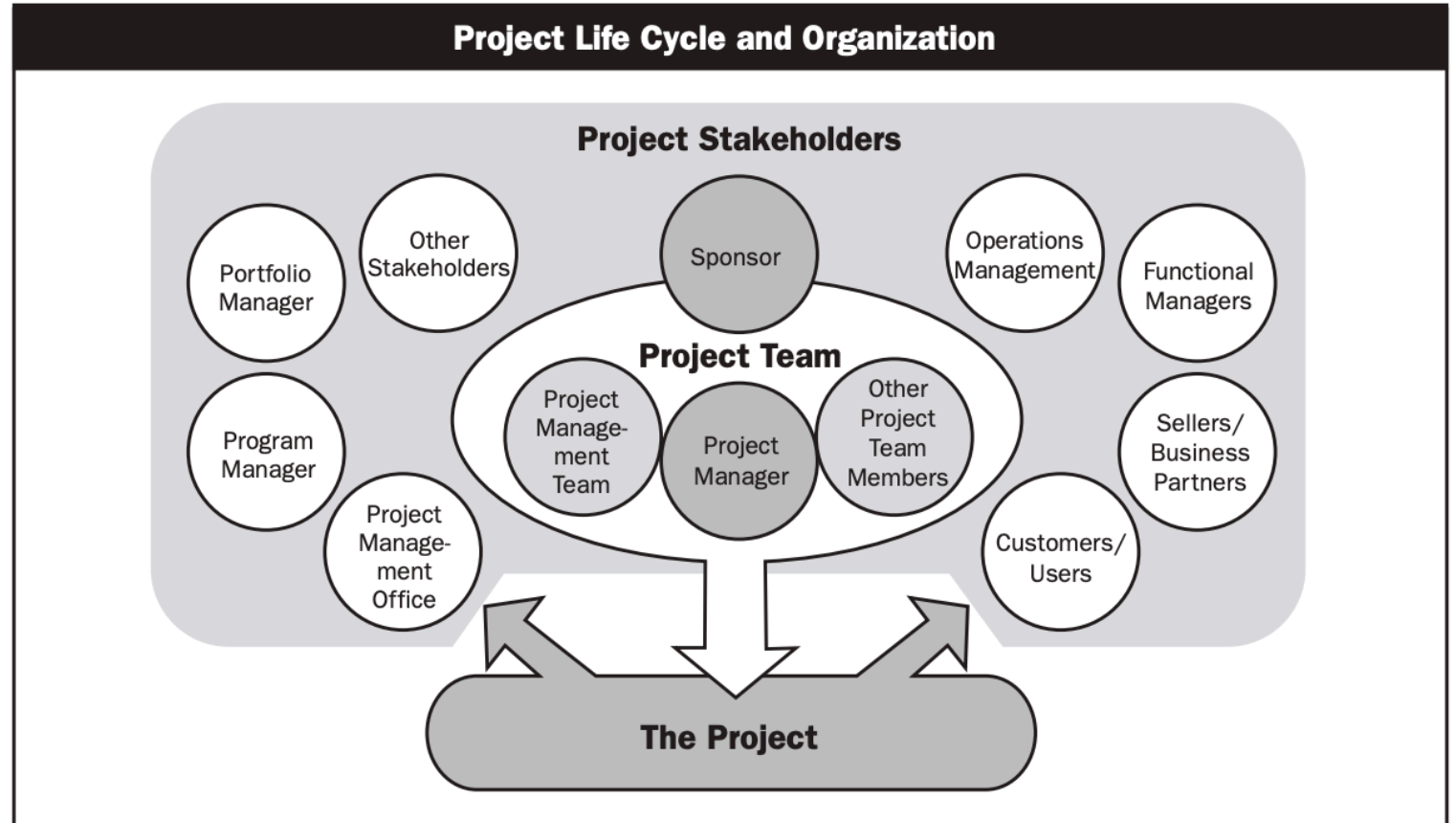


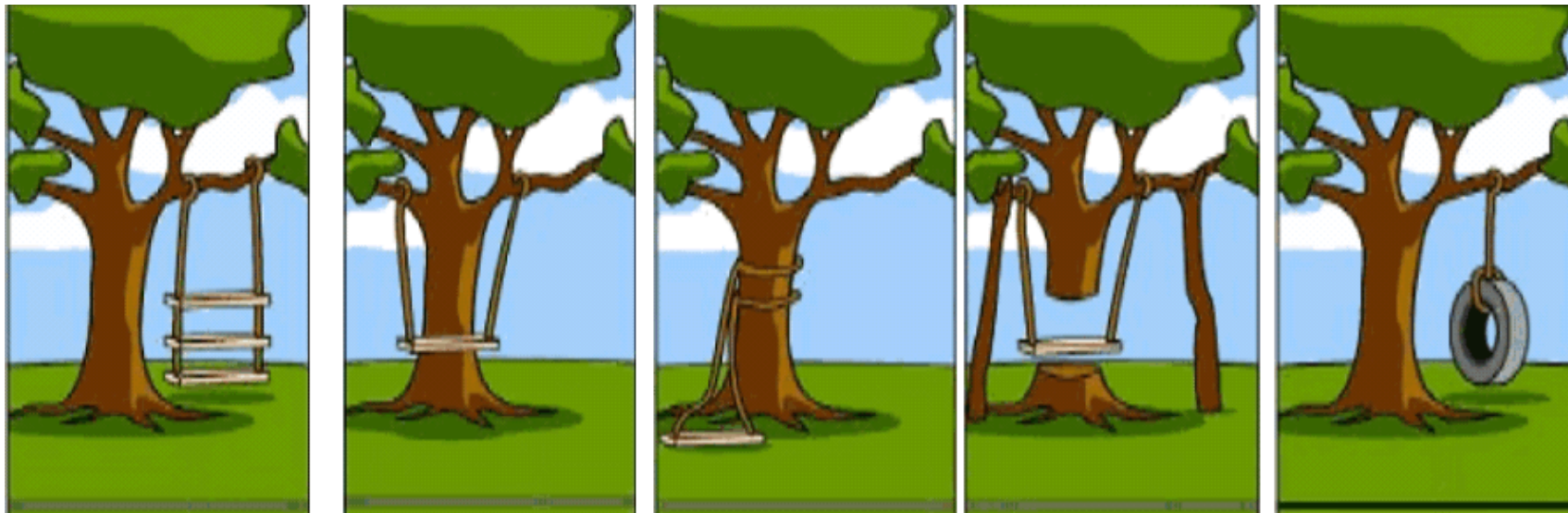
Figure 2-6. The Relationship Between Stakeholders and the Project

Source: PMI Book



One of the most important aspects in a project is scope management

“Project Scope Management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully” – PMI Book



What
marketing
suggested

What
management
approved

What was
designed

What was
delivered

What the
customer
needed



Scope creep – changes, continuous or uncontrolled growth in a project's scope after the project has started

Slik startet byggeskandalen på Stortinget

Det startet med en ambisjon om å utbedre et kontorbygg ved Stortinget for 70 millioner kroner. Nå er prislappen oppe i 2,3 milliarder skattekroner – og dramaet er langt fra over.

Av **ODALERAAN SKJETNE, BJORN HAUGAN, KRISTIAN AASER** og **EIRIK MOSVEEN**

Oppdatert 22. februar 2016

Different causes for scope creep

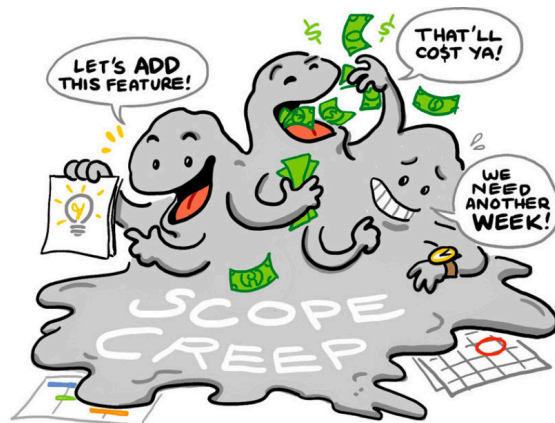
Poor requirements analysis

Not involving the users early enough

Underestimating the complexity

Lack of change control

Gold plating, e.g. adding extra features in the belief it is adding value



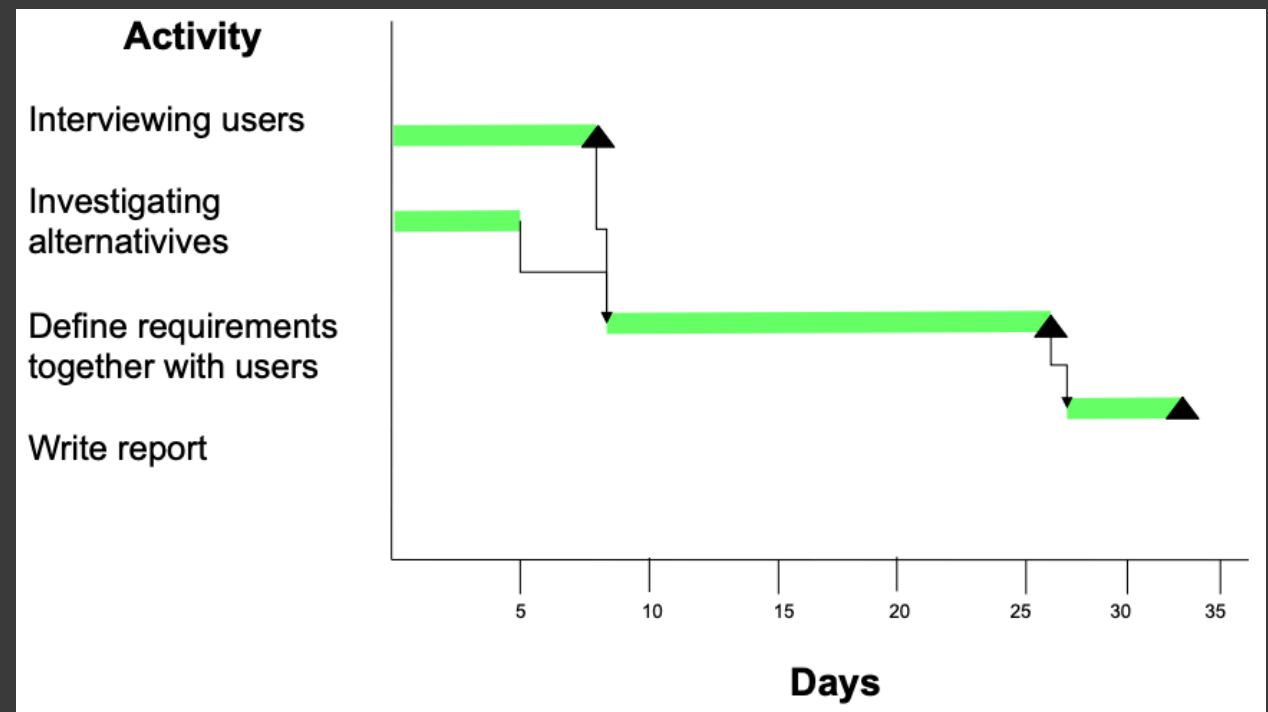
Ivar Hukkelberg (2020)



GANTT Diagrams – Way to illustrate the project activities in a timeline

Helps the project manager to quickly see:

- What are the different activities
- Start and end date of activity
- If activities overlap with other activities
- Start and end date for the whole project
- If there are any activities with slack
- Critical path of the project



What is the critical path here?
Is there any activities with slack?



Project estimation

Costs are often underestimated

Benefits are often overestimated

Why is it difficult to estimate?

Complexity

Software is design

Estimates are often made early

Social and political pressure: “...few people enjoy estimating complex things that they will be held accountable for”

(Berkun, 2005)

Shepperd, M. (2014). Cost prediction and software project management. In G. Ruhe & C. Wohlin (Eds.), *Software Project Management in a Changing World* (pp. 51-71): Springer.



Exercise: estimate time finding literature for your upcoming home exam

Group one:

Q1: Do you think you will spend more or less than 4 hours?

Q2: What is your best estimate for the task?

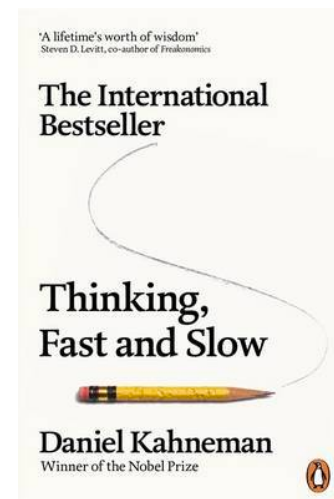
Group two:

Q1: Do you think you will spend more or less than 16 hours?

Q2: What is your best estimate for the task?

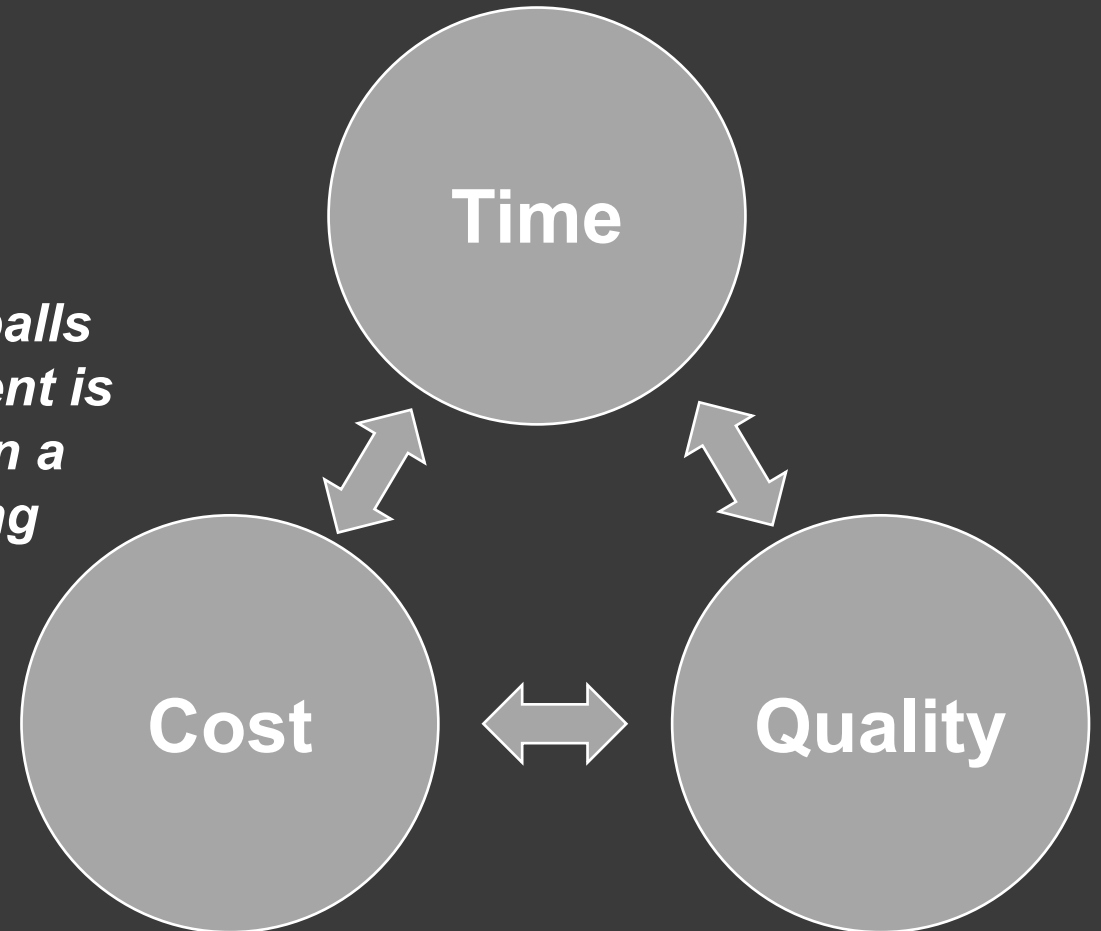
Anchoring and adjustment

«...is a psychological heuristic that influences the way people intuitively assess probabilities. According to this heuristic, people start with an implicitly suggested reference point (the "anchor") and make adjustments to it to reach their estimate...» (<https://en.wikipedia.org/wiki/Anchoring>)



Project Management's time/cost/quality triangle

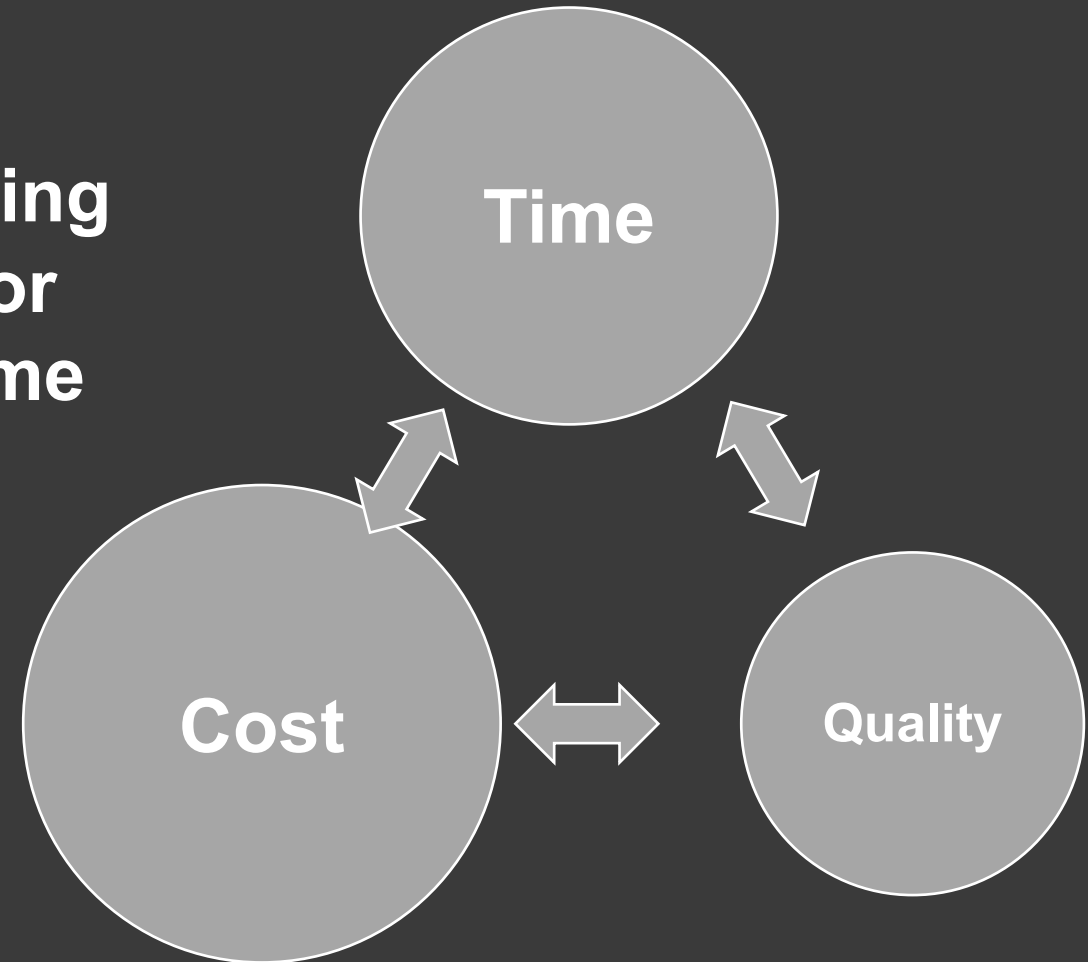
“Project management is like juggling three balls – time, cost and quality. Program management is like a troupe of circus performers standing in a circle, each juggling three balls and swapping balls from time to time.” - G. Reiss



Example: If a project has spent too much time

Must choose between increasing cost (e.g. hire more workers) or reduce quality to deliver on time

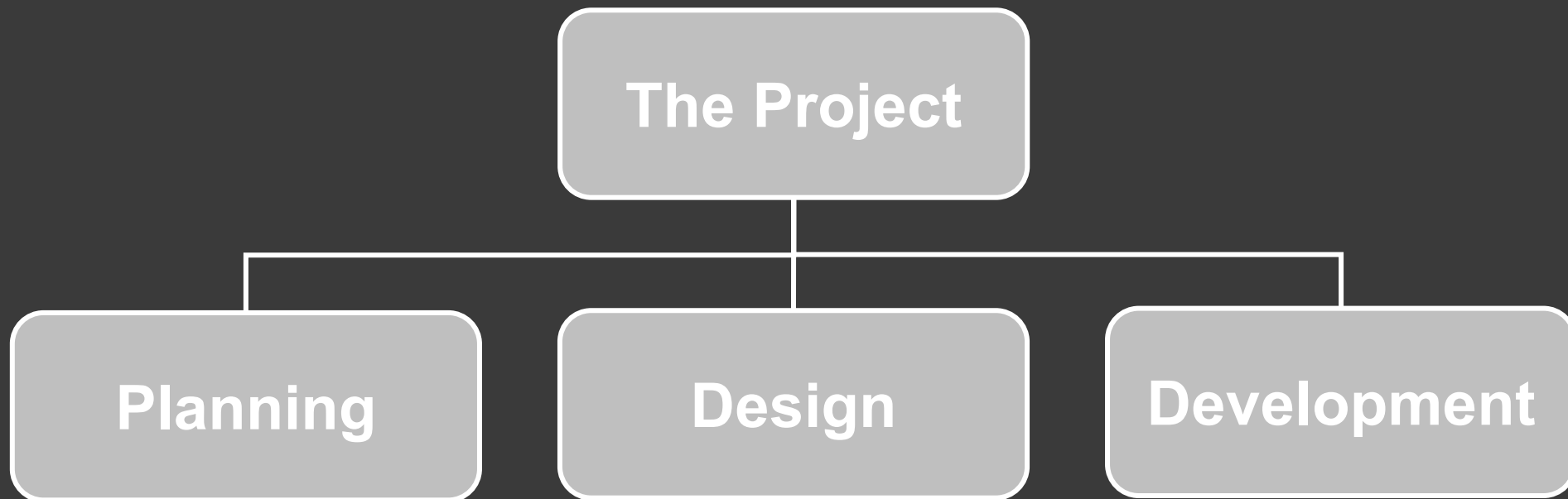
Changing one aspect has consequences for the others



Work breakdown structure

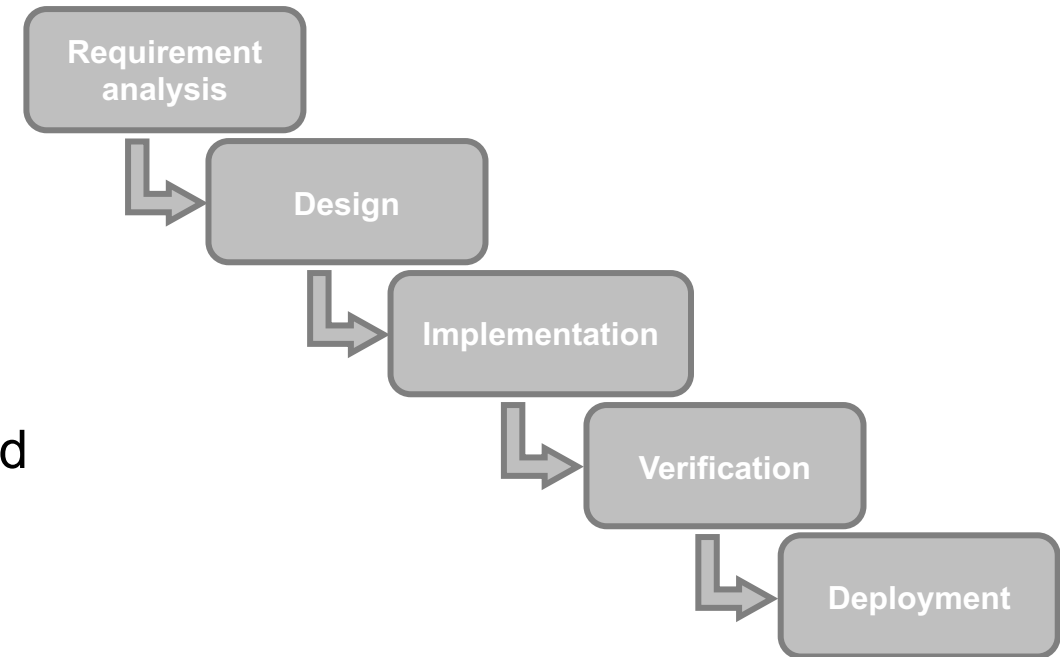
Dividing the project in smaller parts – activities or work packages

Presented as a hierarchy of activities with increasing details



Summary: Traditional PM approach

- Focus on management control and planning
- Detailed plans carried out in a waterfall-like fashion
- Hierarchical organizations often with a top-down approach to project governance
- A lot of activities to control what project members are doing
- Little flexibility for bottom-up flexibility and initiatives
- IT-projects: requirements must be defined up-front and not change too much
- Can mix with other approaches? Spundak (2014)



Špundak, M. (2014). Mixed agile/traditional project management methodology–reality or illusion?. *Procedia-Social and Behavioral Sciences*, 119, 939-948.





**But is the PM model
suitable for today's IT
projects?**



20% of all IT projects are «Black Swans»



Budzier, A., & Flyvbjerg, B. (2012). Overspend? Late? Failure? What the data say about IT project risk in the public sector. Commonwealth Governance Handbook, 13, 145-157.

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Photo by [Qurratul Ayin Sadia](#) on [Unsplash](#)

A top-down view of a workspace with various office supplies. In the center, a roll of blue tape is partially unrolled. Surrounding it are numerous sticky notes in shades of yellow, orange, pink, and light green. Some notes have handwritten text, such as 'No 9f' on a pink note and 'UNIVERSITÄT' on a yellow note. Several markers in various colors (red, green, purple, blue, black) are scattered around the notes. The background is a dark, textured surface.

Agile Project Management

Agile project management approaches



Less emphasis on plans and strict control



Relies more on informal collaboration, coordination and learning.



About managing the impact of complexity and uncertainty

Four principles of agile project management



Minimum critical specification



Autonomous teams



Redundancy



Feedback and learning

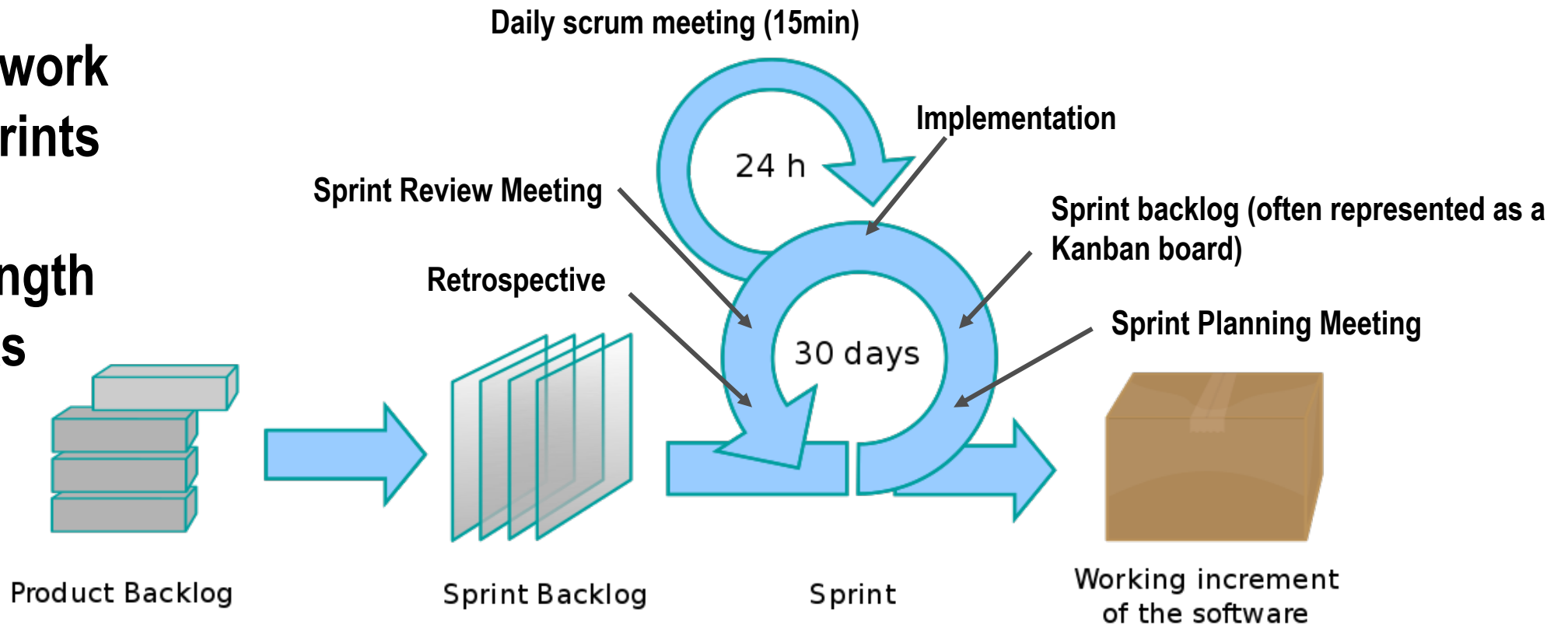
Source: Agile Project Management (Dybå, Dingsøy and Moe, 2014)



Agile process: Scrum methodology

Iterative work
using sprints

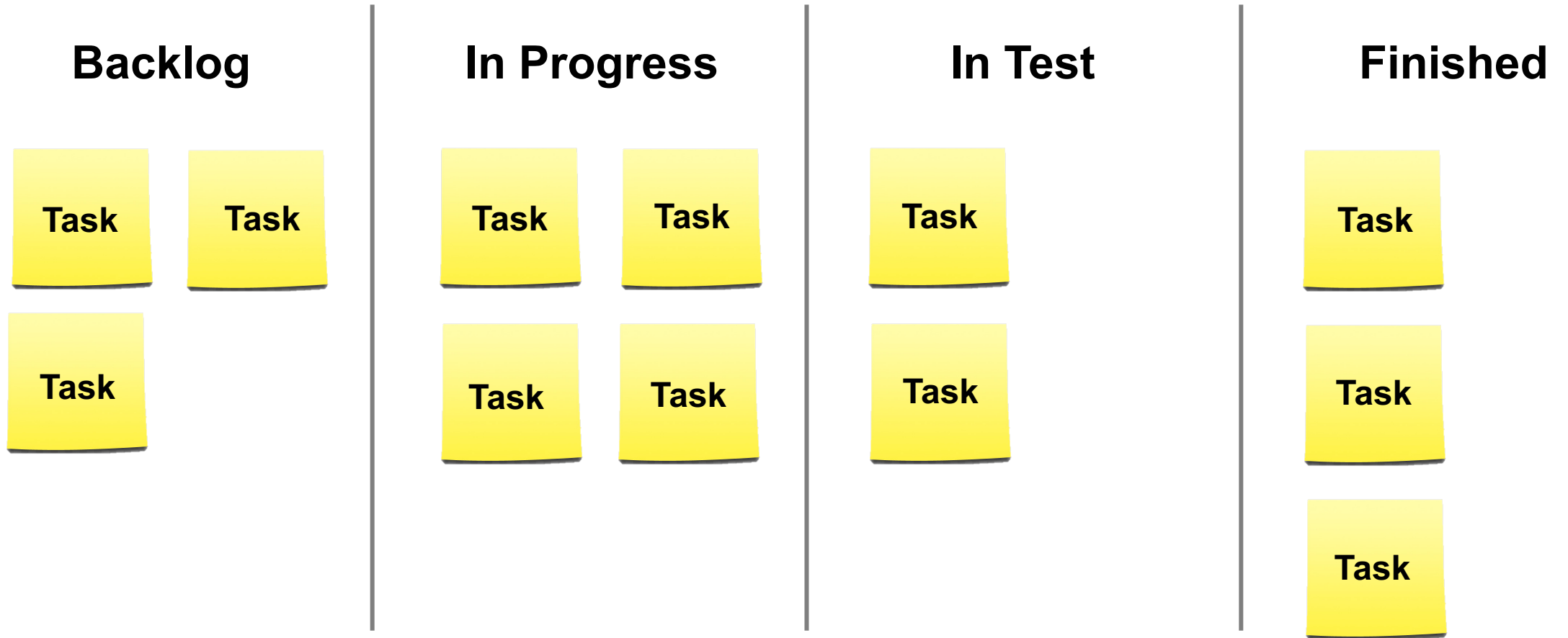
Sprint length
2-3 weeks



<https://no.wikipedia.org/wiki/Scrum>

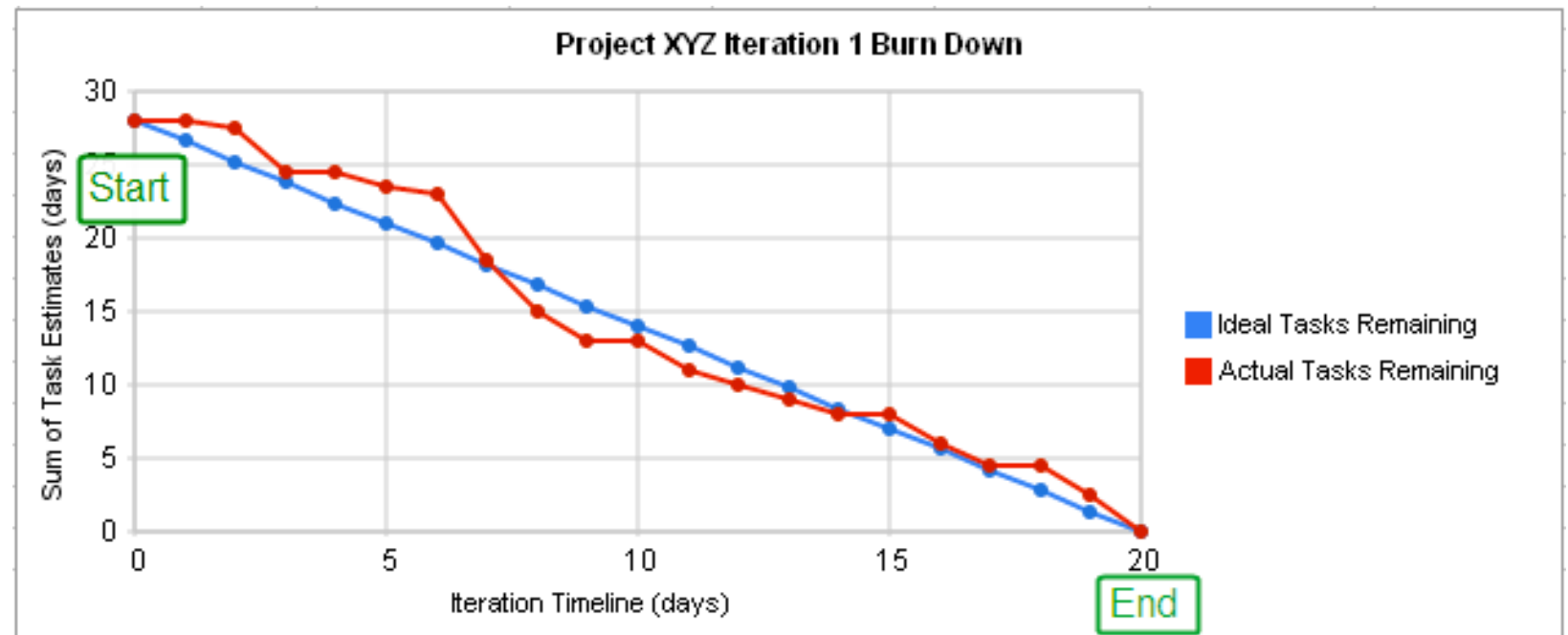


Agile process: Kanban



Burn down chart

A chart that showcase how much work is left to do vs time



https://en.wikipedia.org/wiki/Burn_down_chart





Waterfall



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Photo by [Andri klopfenstein](#) on [Unsplash](#)



Agile

Photo by [Deniel Fazekas](#) on [Unsplash](#)

Ok, time for an exercise!

1. Based on what we have just talked about - write down a list of characteristics for both waterfall and agile (3min)



Waterfall vs Agile

Waterfall

Agile



Waterfall vs Agile

Waterfall

- Highly structured / inflexible
- Fixed plan
- Requirements must be clear from the beginning
- Easy to track progress
- Easy to report status to management / business
- Clearly defined roles
- Good for hardware development
- Process centric

Agile

- Highly flexible
- Adaptable plan
- Feedback / retrospective
- Fast MVP (minimum viable product)
- Requirements evolve during the project
- Cross-disciplinary teams
- Harder to keep track of overall progress and do reporting
- Good for innovation
- User involvement
- People centric



Waterfall vs Agile

	Traditional	Agile
Fundamental Assumptions	Systems are fully specifiable, predictable, and can be built through meticulous and extensive planning.	High-quality, adaptive software can be developed by small teams using the principles of continuous design improvement and testing based on rapid feedback and change.
Control	Process centric	People centric
Management Style	Command-and-control	Leadership-and-collaboration
Knowledge Management	Explicit	Tacit
Role Assignment	Individual—favors specialization	Self-organizing teams—encourages role interchangeability
Communication	Formal	Informal
Customer's Role	Important	Critical
Project Cycle	Guided by tasks or activities	Guided by product features
Development Model	Life cycle model (Waterfall, Spiral, or some variation)	The evolutionary-delivery model
Desired Organizational Form/Structure	Mechanistic (bureaucratic with high formalization)	Organic (flexible and participative encouraging cooperative social action)
Technology	No restriction	Favors object-oriented technology

Nerur, S., Mahapatra, R., & Mangalaraj, G. (2005). Challenges of migrating to agile methodologies. *Communications of the ACM*, 48(5), 72-78.



Mixed approaches: Water-Scrum-Fall

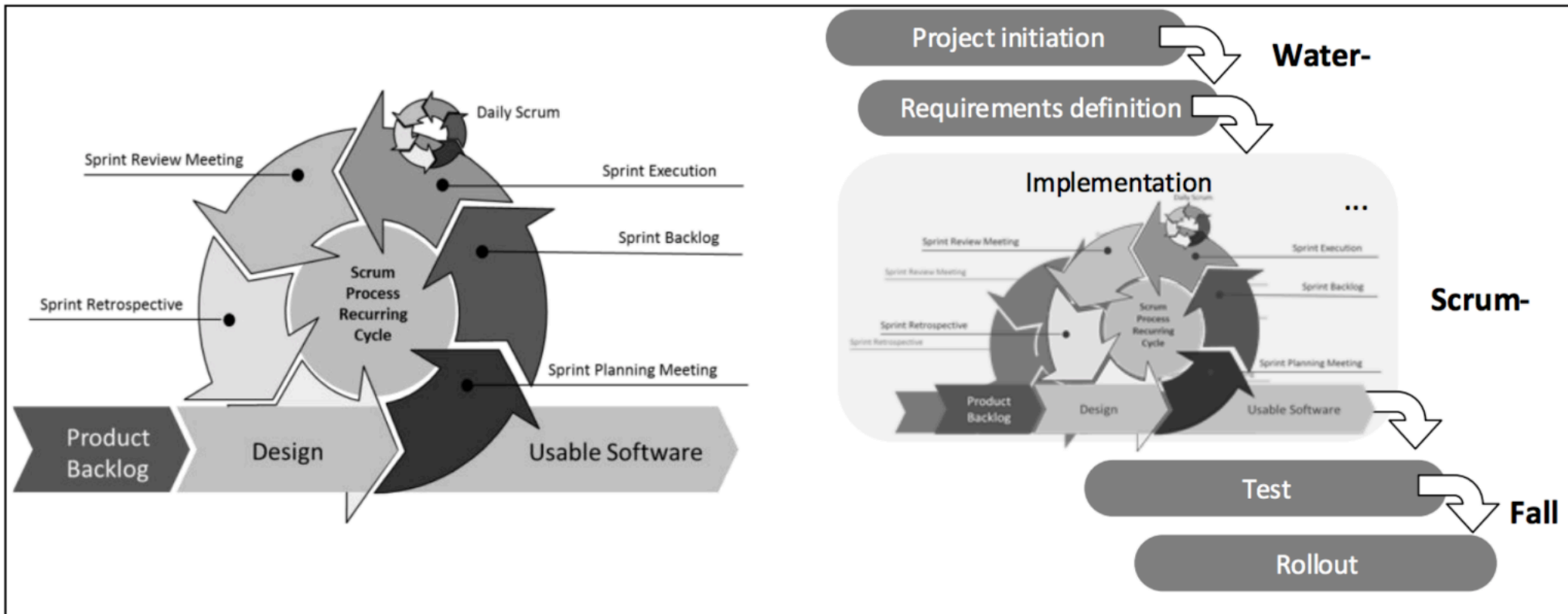


Figure 1. Scrum process cycle (left) and Water-Scrum-Fall process (right)

Schlauderer, S., Overhage, S., & Fehrenbach, B. (2015). Widely Used but also Highly Valued? Acceptance Factors and Their Perceptions in Water-Scrum-Fall Projects.



To summarize

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Thank you!

