System Development and Project Organization (BSUP)

Paolo Tell

Introduction to Software Project Management

Mountain Goat Software, LLC

IT University of Copenhagen

Outline

- Survey on the Scrum lecture series
- Introduction to SPM
- Exercise session: User story workshop

Survey [20’]
http://goo.gl/forms/XtqtXS241O

Introduction to SPM

Before we start …

- [5’] - govote.at
- [?’] - discussion

If I am studying software development, why should I bother?

- More and more systems are software controlled.
- Nowadays, the expenditure on software represents a significant fraction of gross national product (GNP) in all developed countries.
- Individual approaches were unable to scale up to larger and more complex systems.
- The "software crisis" (Naur and Randell, 1969), the birth of "software engineering" in 1968.
  - http://homepages.cs.ncl.ac.uk/brian.randell/NATO/nato1968.PDF
- Between the 1970s and 1980s, a variety of software engineering techniques and methodologies were developed together with tools and standardized notations…
- … and this trend is still continuing.
- … however, after more than 40 years, developing software is still a challenging endeavour that can fail.

Cases
Ariane 5 Flight 501

https://www.youtube.com/watch?v=gp_D8r-2hwk

- 4th June 1996. Approximately 37 seconds after a successful lift-off, the Ariane 5 launcher lost control (a 370kk dollar firework).
- The crash report identifies a software bug as the direct cause (integer overflow).
- Incorrect control signals were sent to the engines and these swivelled so that unsustainable stresses were imposed on the rocket.
- It started to break up and was destroyed by ground controllers.
- The system failure was a direct result of a software failure. However, it was symptomatic of a more general systems validation failure.
  - http://en.wikipedia.org/wiki/Ariane_5_Flight_501

Cases
Denver airport

https://www.youtube.com/watch?v=xx8f4x6C_KY

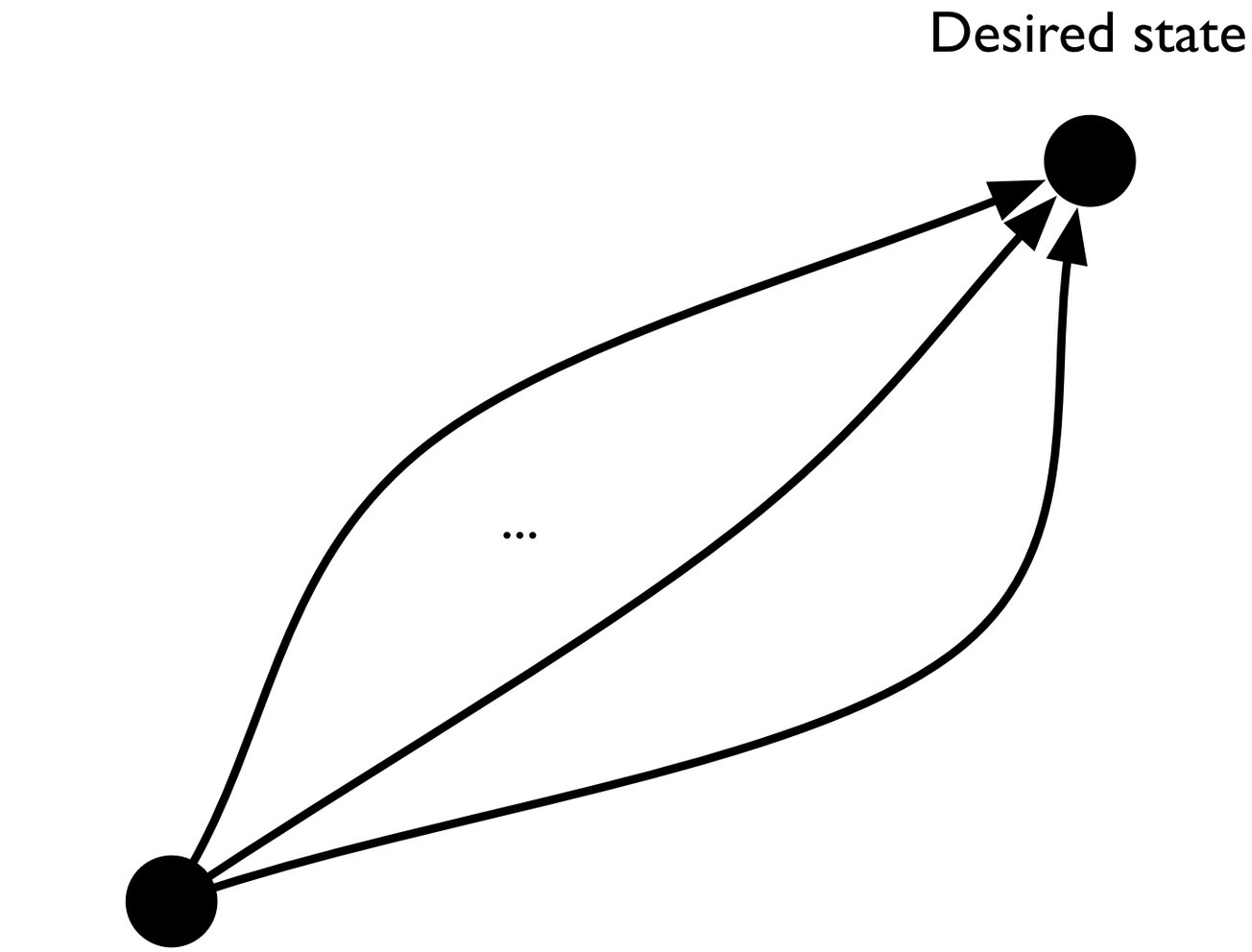
- June 1991 - United Airlines plans to build an automatic baggage system at the Denver airport.
- Summer 1991 - The management of the airport requests the baggage system for the complete airport.
- August 1992 - De-scoping saves $20kk
- Target airport opening shifts from October 1993 (to December 1993) (to March 1994) (to May 1994) to February 1995 while tests continue to fail
- August 2005 - the system is scrapped in favour of a fully manual system. Maintenance costs reached $1kk/month
- Estimated loss of $600kk over 10 years

Cases
Death Star

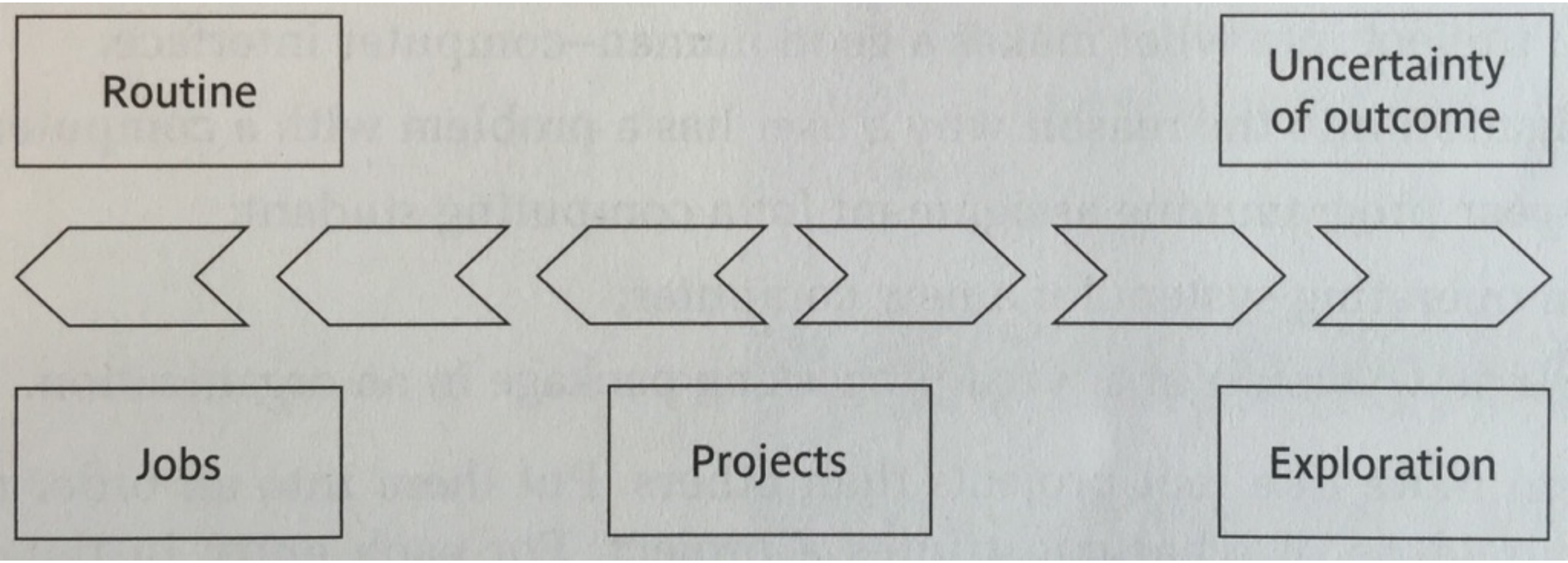
https://www.youtube.com/watch?v=qQB2NXfJev0

- General Tagge — "Until this station is operational, we are vulnerable. The Rebel Alliance is too well equipped. They're more dangerous than you realize."
  - Admiral Motti — "Dangerous to your starfleet commander, not to this battle station."
- Admiral Motti — "Any attack made by the rebels against this station would be a useless gesture, no matter what technical data they've obtained. This station is now the ultimate power in the universe."
  - https://www.youtube.com/watch?v=Zzs-OvfG8tE&feature=youtu.be&t=9s

What is a project?



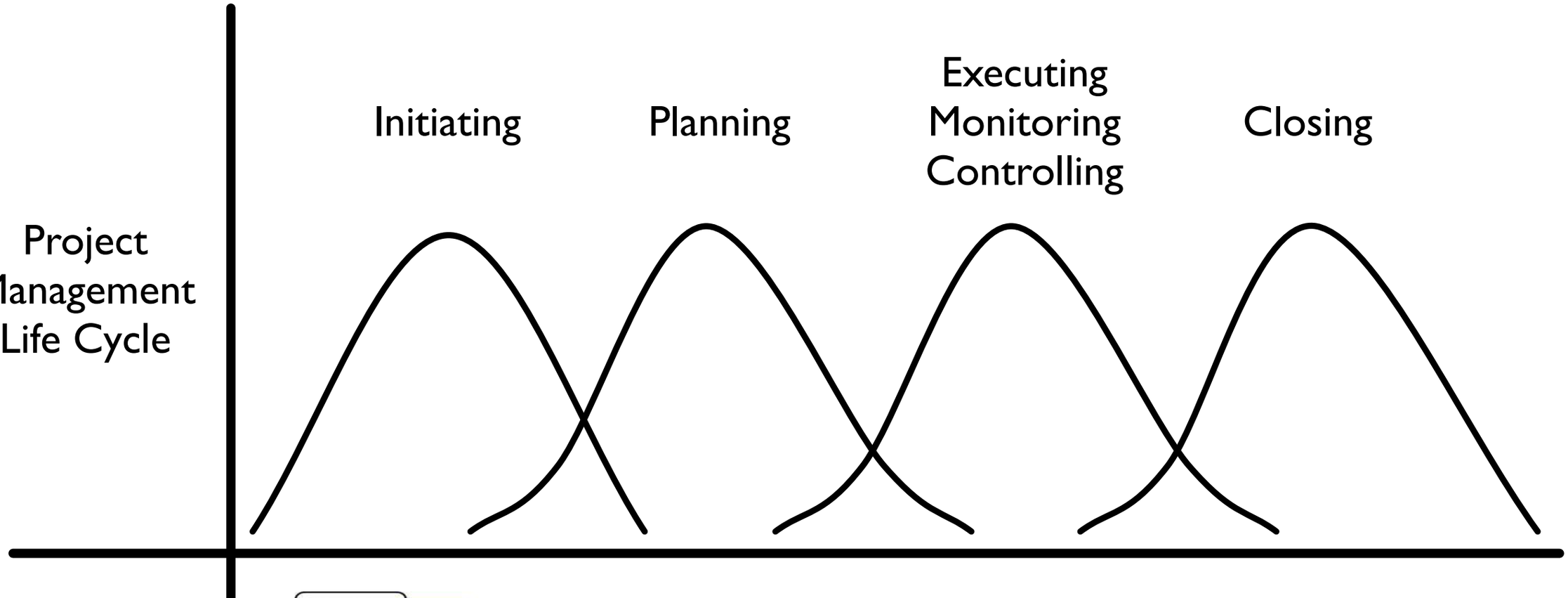
Characteristics of a project



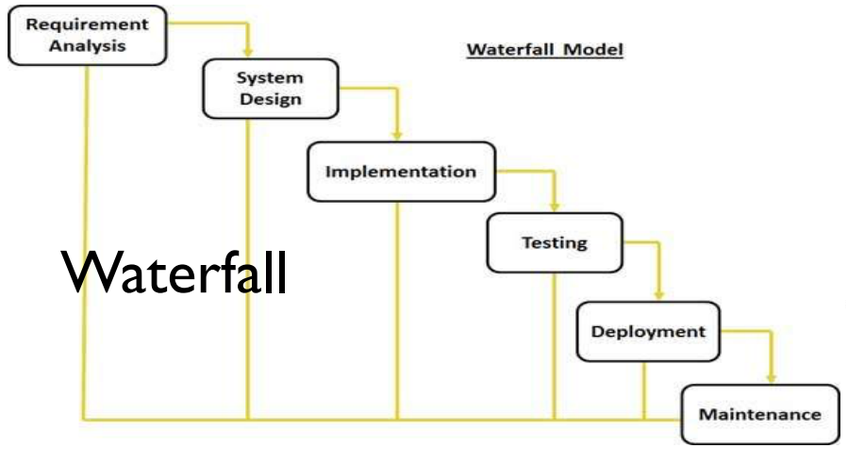
Characteristics of a project

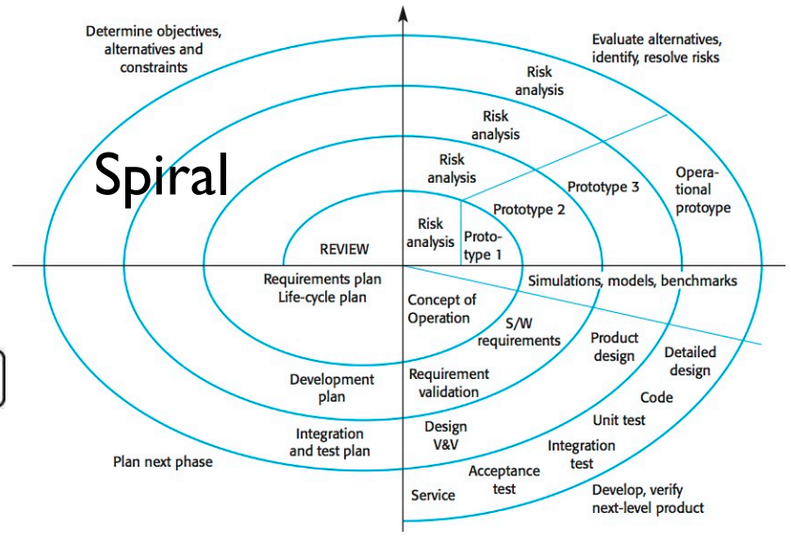
- Non-routine tasks are involved.
- Planning is required.
- Specific objectives are to be met or a specific product is to be created.
- The project has a predetermined time span.
- Work is carried out for someone other than yourself.
- Work involves several specialisms.
- People are formed into a temporary work group to carry out the task.
- Work is carried out in several phases.
- The resources that are available for use on the project are constrained.
- The project is large and complex.

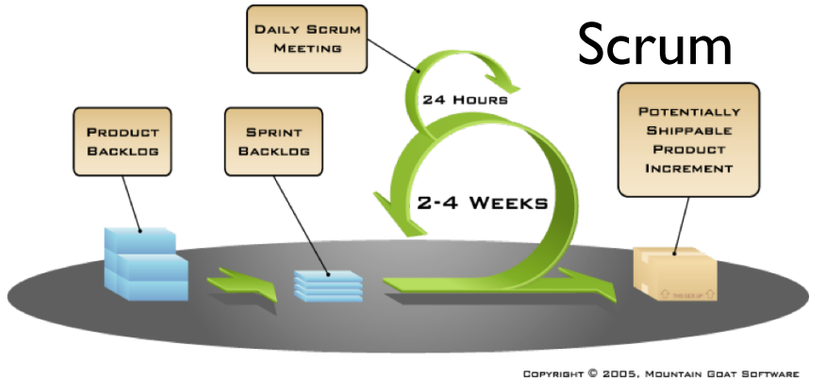
Project Management Life Cycle



Software Development Life Cycle







- Rational Unified Process (RUP)
- eXtreme Programming (XP)
- Feature-Driven Development
- ...

SPM versus PM
What is special?

- Complexity
- Conformity
- Changeability [Flexibility]
- Invisibility

Source: Brooks, F. P. J. (1987). "No Silver Bullet Essence and Accidents of Software Engineering". Computer, 20(4), 10–19.

Terminology

- Method / Process — Abstract representation of a systematic way of accomplishing something (e.g., Scrum).
- Plan — Implementation of a method.
- Methodology — A series of related methods guided by some principles (e.g., Agile methodologies).
- Practice — Reality. The observable implementation of a plan.
- Product — "A set of software intensive systems sharing a common and managed set of features satisfying the specific needs of a particular market segment or mission" (Carnegie Mellon Software Engineering Institute).

Exercise [45’]

- In groups of four, work out how you would obtain an accurate estimate of the height of the building.

- Plan how you would carry out any actions needed to obtain your estimate.
  - 20’
  - You must remain in this room for this planning phase.

- Once planning is complete, implement your plan.
  - Time how long it takes to produce your final figure.
  - Come back and report hight estimate and time.

Concluding

Outline

- Survey on the Scrum lecture series
- Introduction to SPM
- Exercise session: User story workshop