

Projects and Project Planning

Lecture 3

Kari Systä

How to contact us

- Lectures, grading, exams etc.
 - kari.systa@tut.fi
- Exercises, project etc
 - tero.ahtee@tut.fi

About project / assignment

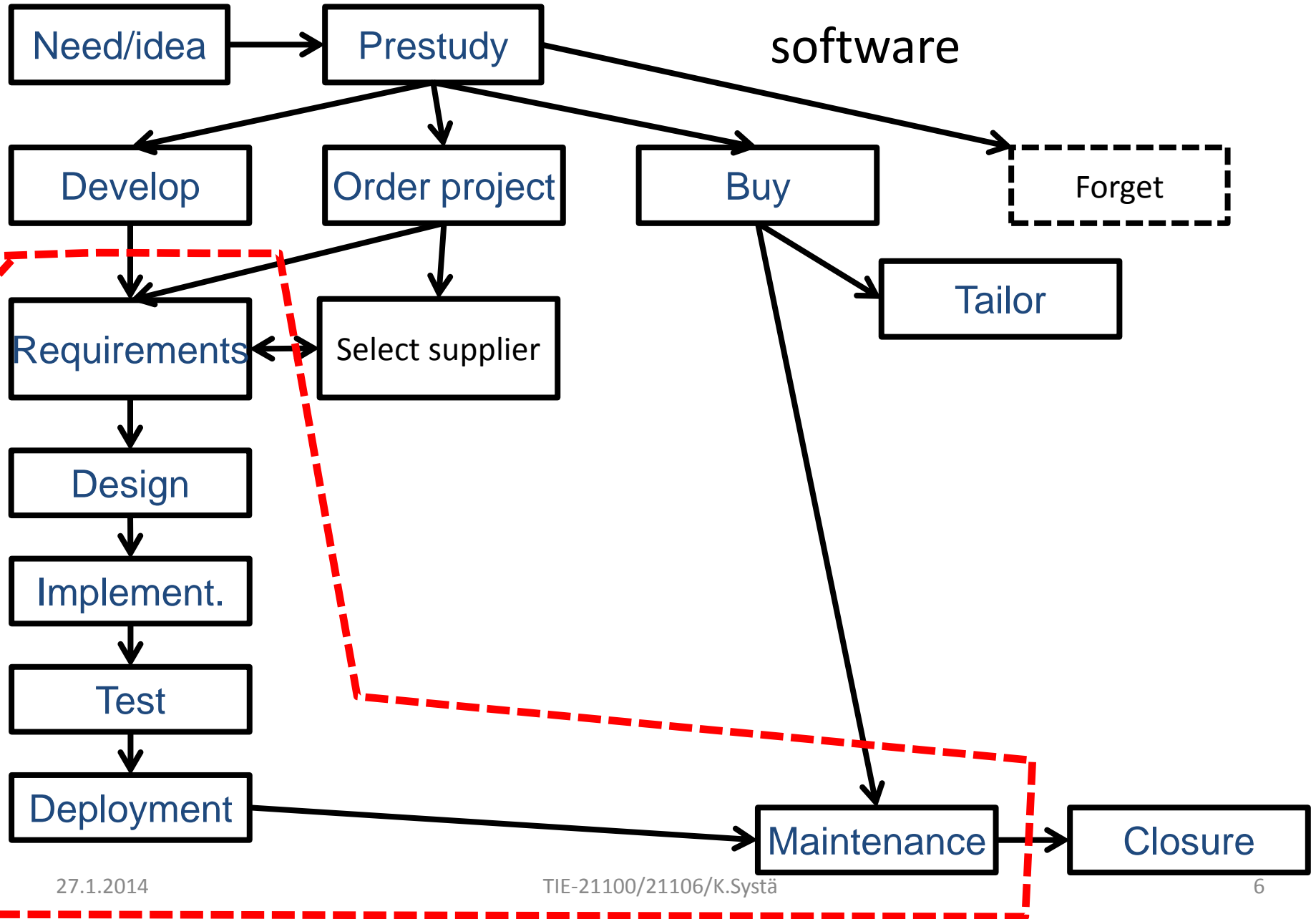
- Will be done in groups of ~4 (min 3, max 5)
- If you are not registered in IDLE (contact tero.ahtee@tut.fi)
- IDLE for registering deadline passed, but you still can
 - Staff will start merging 28.1
 - If you do not have complete group, you should still register. The staff will combine.
- Project will run in 4 Sprints
- Instructions (still under preparation)
<http://www.cs.tut.fi/kurssit/TIE-21106/assignment/index.html>

Recap of previous lectures

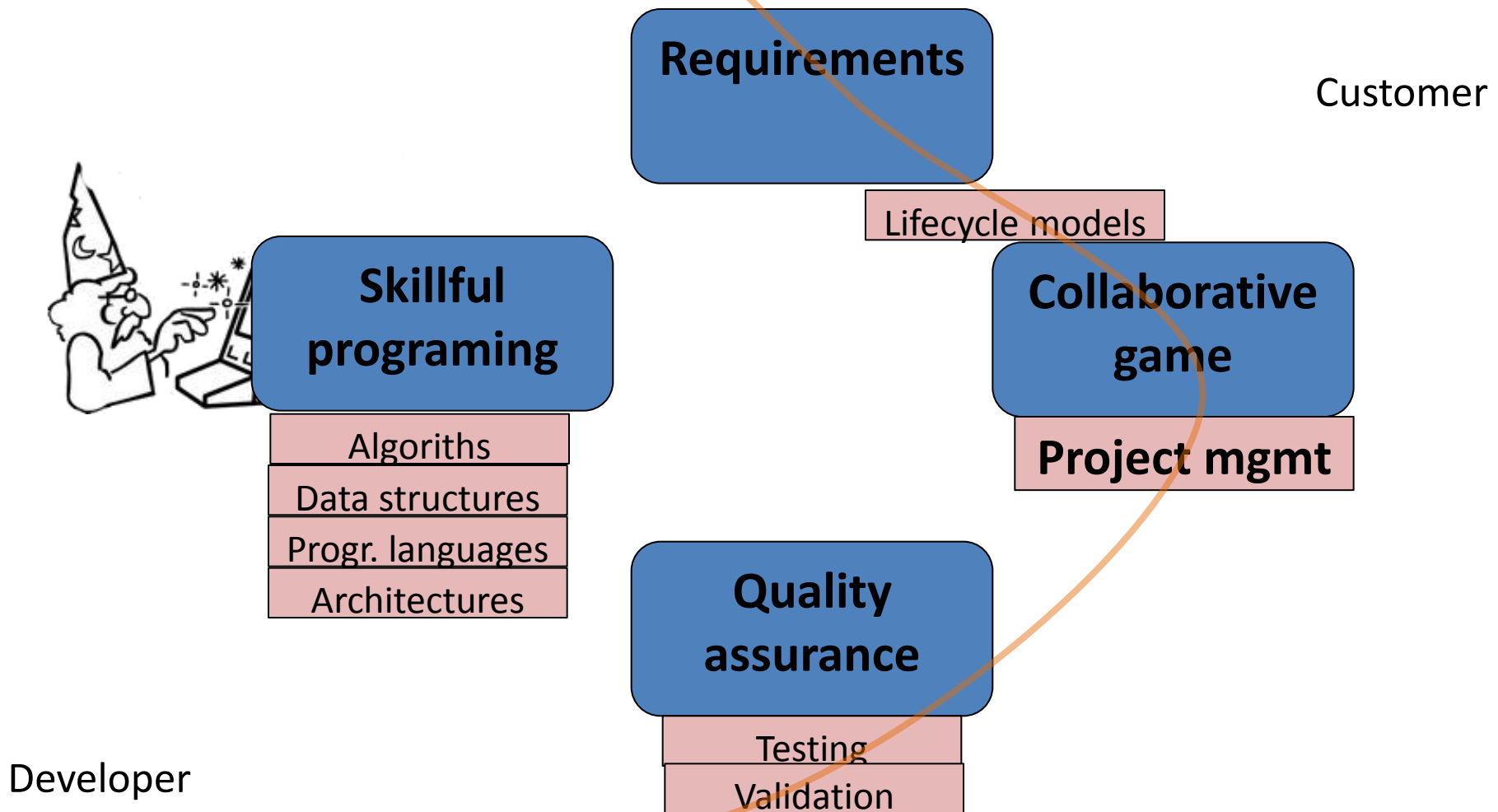
A few definitions

- " Software engineering may be defined as the systematic design and development of software products and the management of the software process"
 - Mills, H.D. , IBM Systems Journal
Vol19 , Issue: 4, 1980
- "Software Engineering is the study and application of engineering to the design, development, and maintenance of software."
 - http://en.wikipedia.org/wiki/Software_engineering

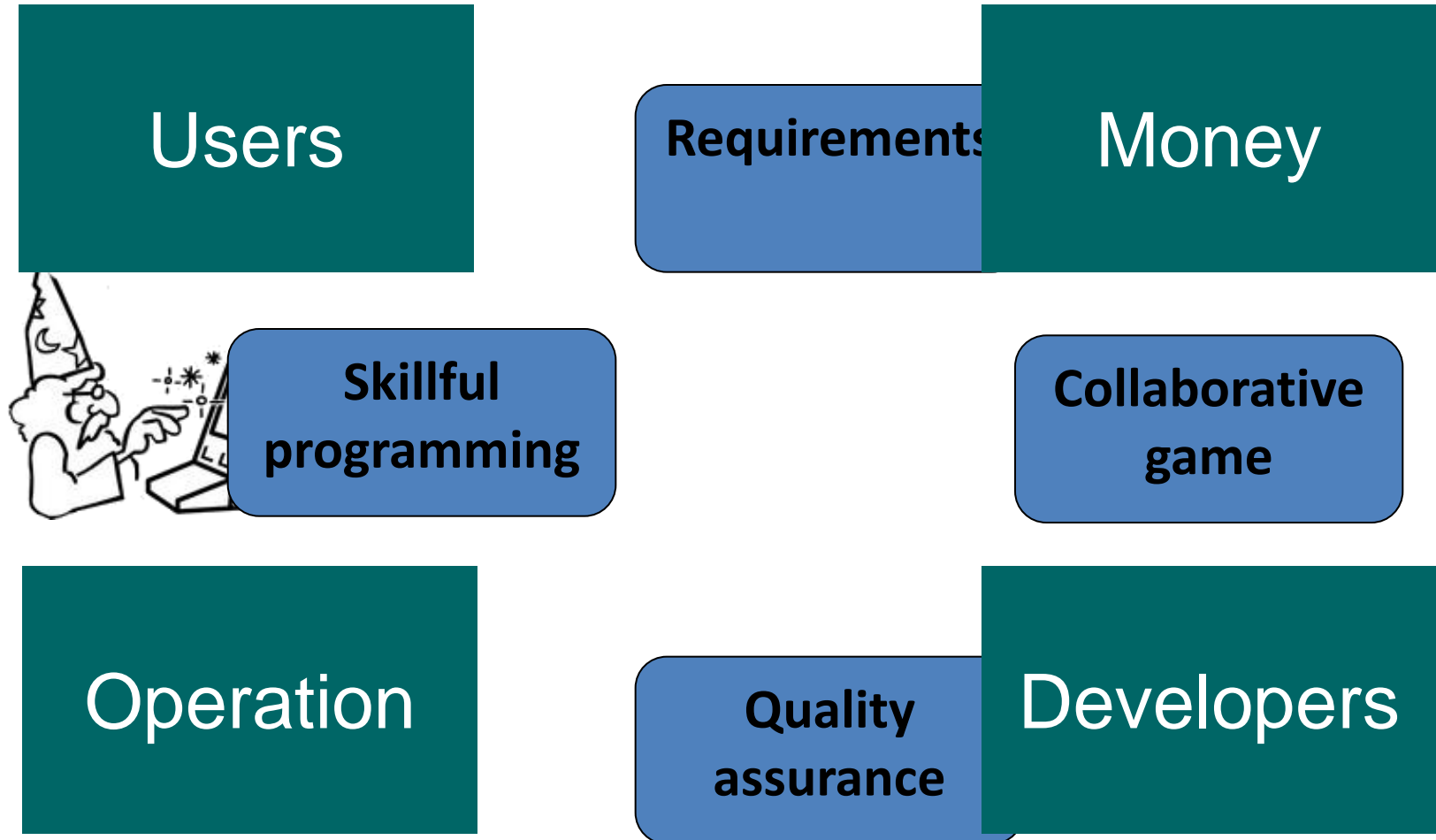
From needs to
software



What is software engineering

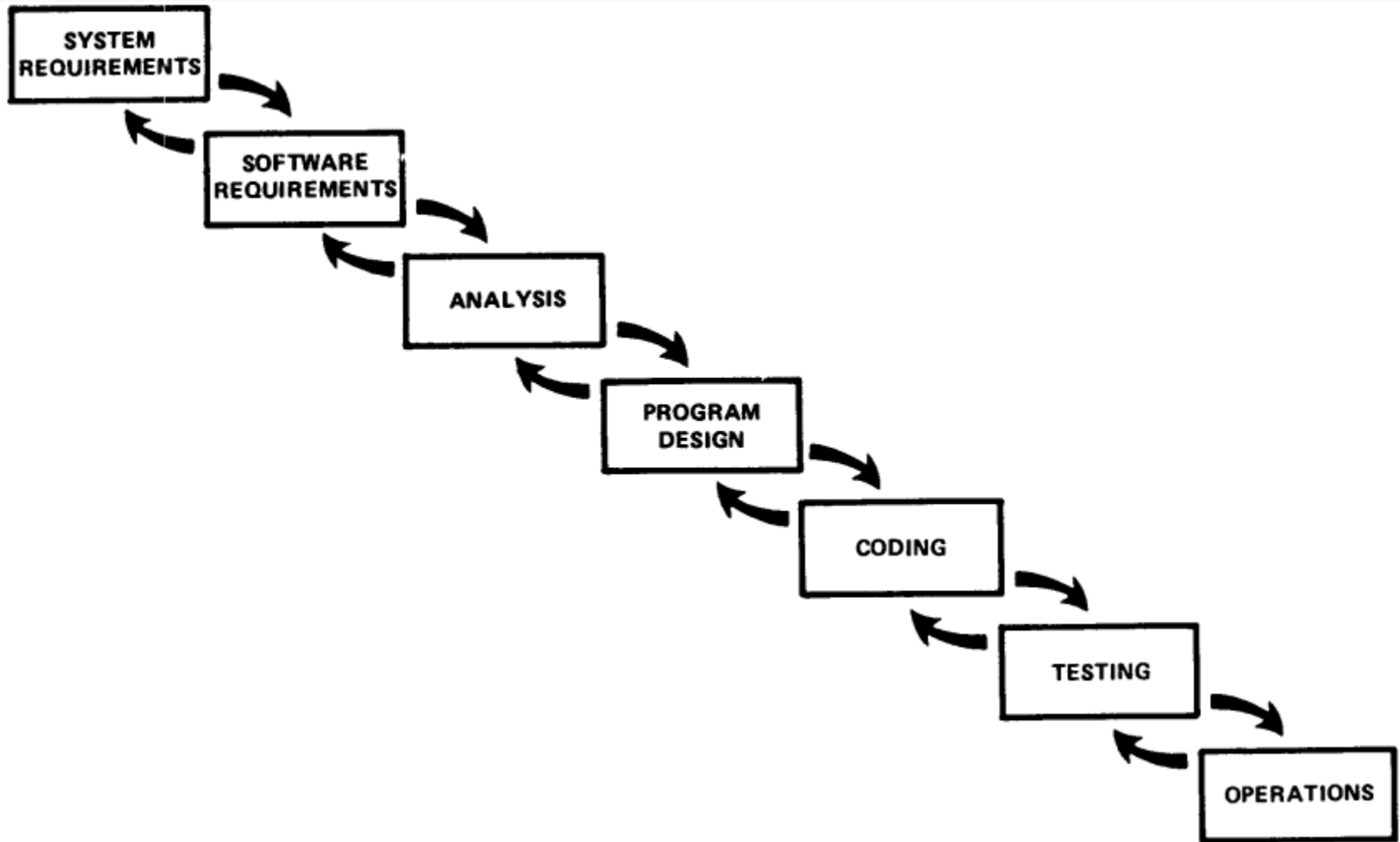


Extended view



Royce, 1970

(<http://www.cs.umd.edu/class/spring2003/cmsc838p/Process/waterfall.pdf>)



Precursor of interative models: Spiral Model

(picture from: <http://www.sei.cmu.edu/reports/00sr008.pdf>)

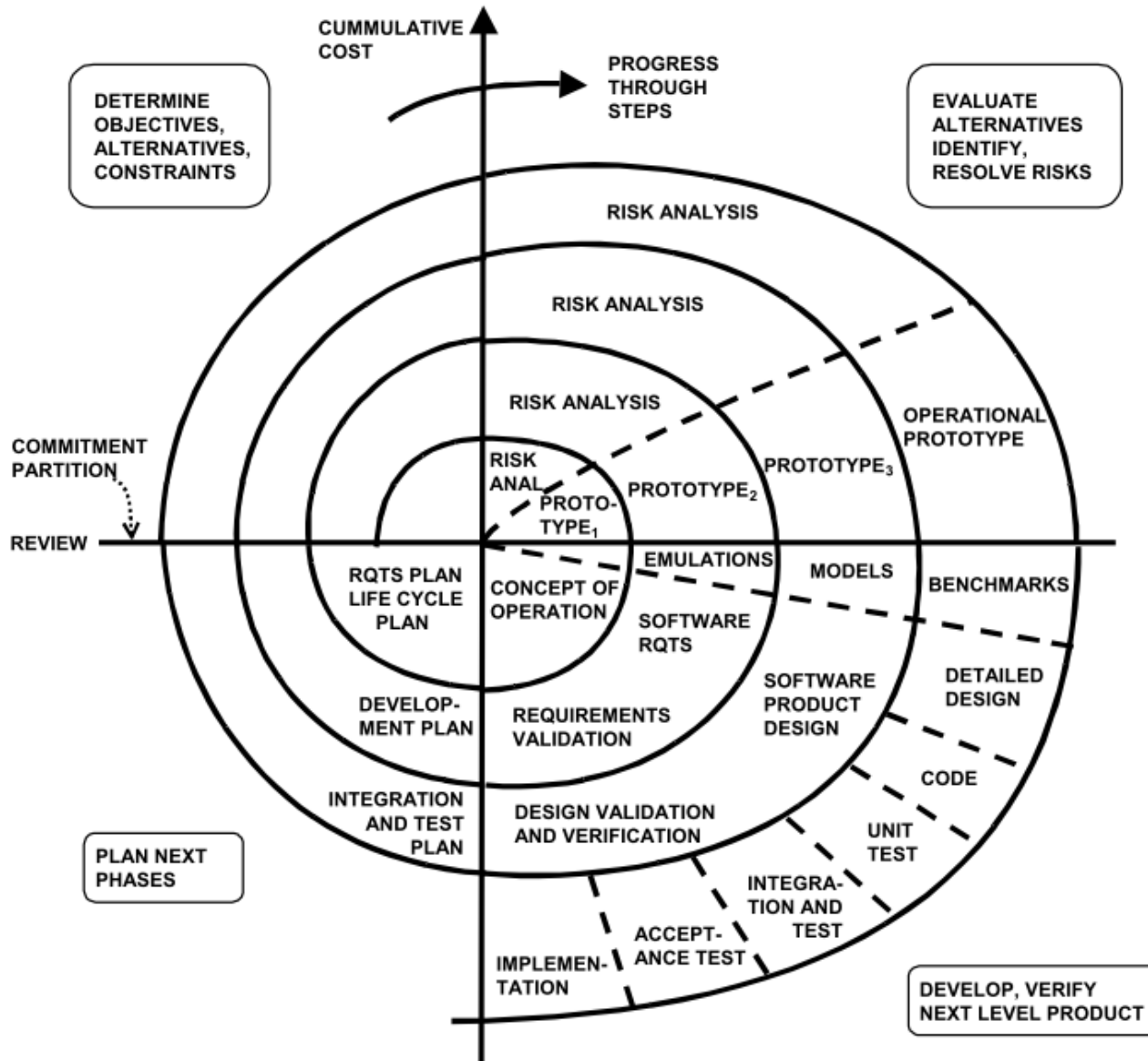
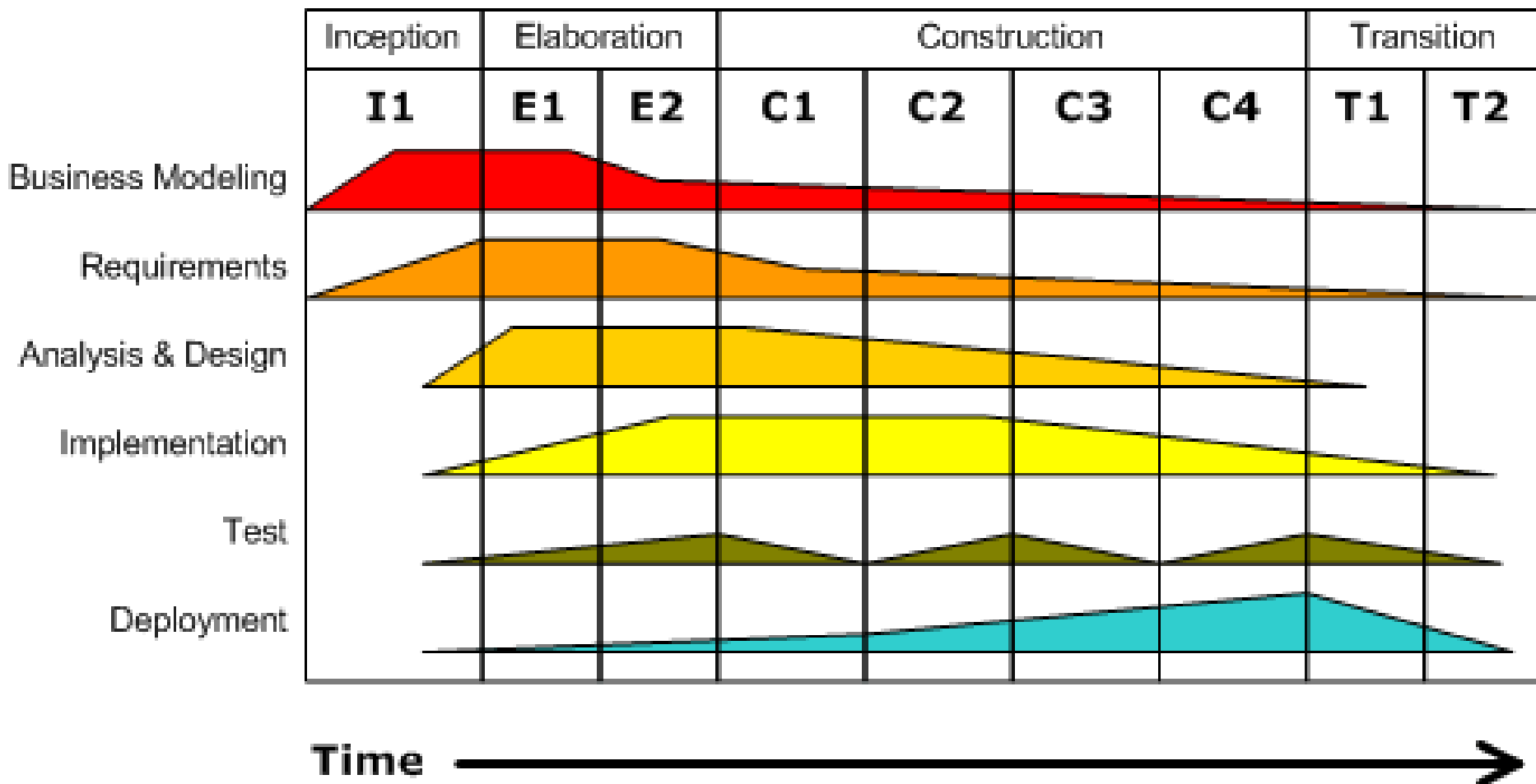


Figure 1: Original Diagram of Spiral Development

Iterative model: RUP (Rational Unified Process)

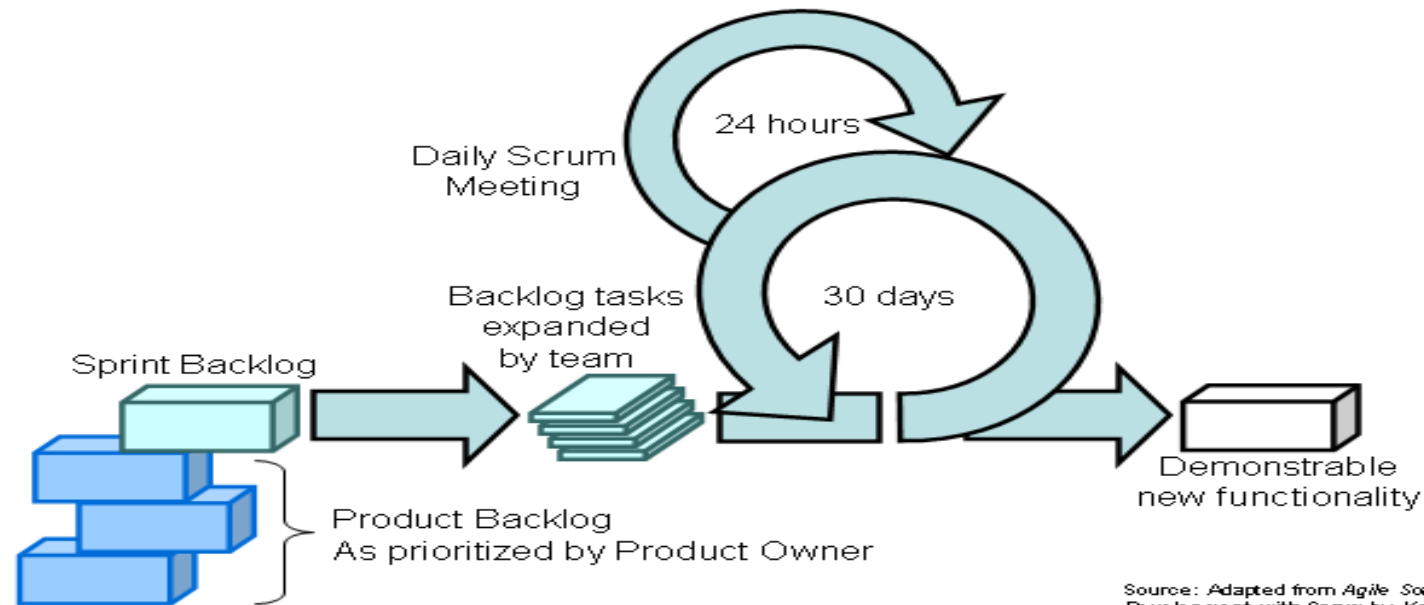
Iterative Development

Business value is delivered incrementally in time-boxed cross-discipline iterations.



Scrum

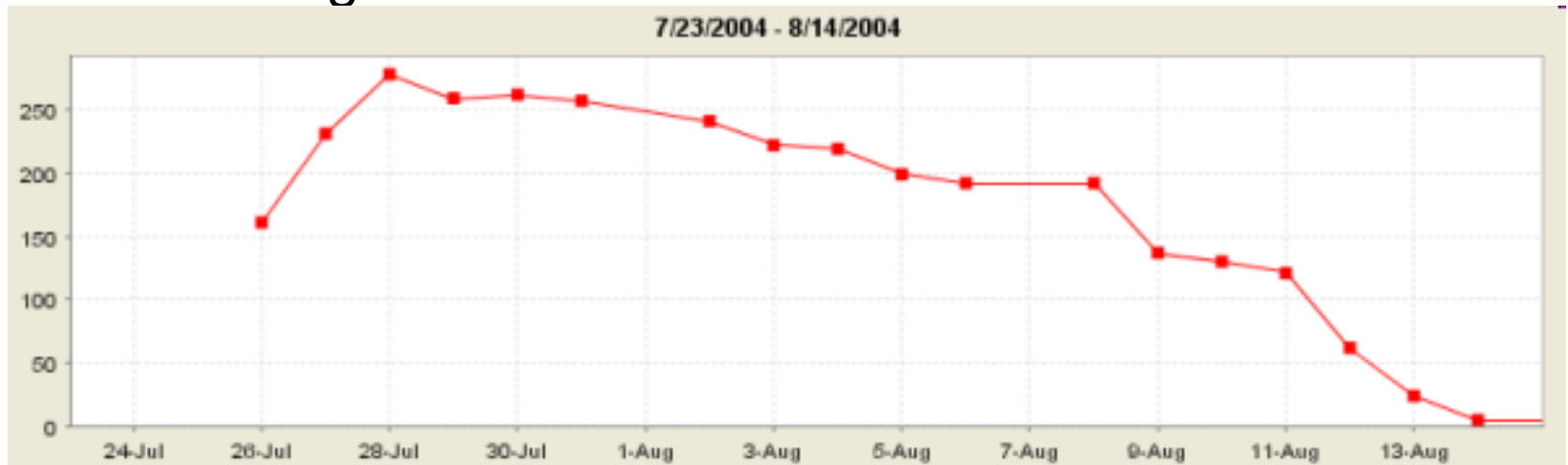
- Framework for agile and iterative development
- Jeff Sutherland, John Scumniotales, and Jeff McKenna OOPSLA 95



The following slides were postponed to
next lecture

Burndown -Chart

- Definition of done === 100% done
- Velocity -> The velocity is calculated by counting the number of units of work completed in a certain interval (sprint in case of Scrum)
- When task is done value in chart is reduced
- If the task grows value is increased



Timeboxing

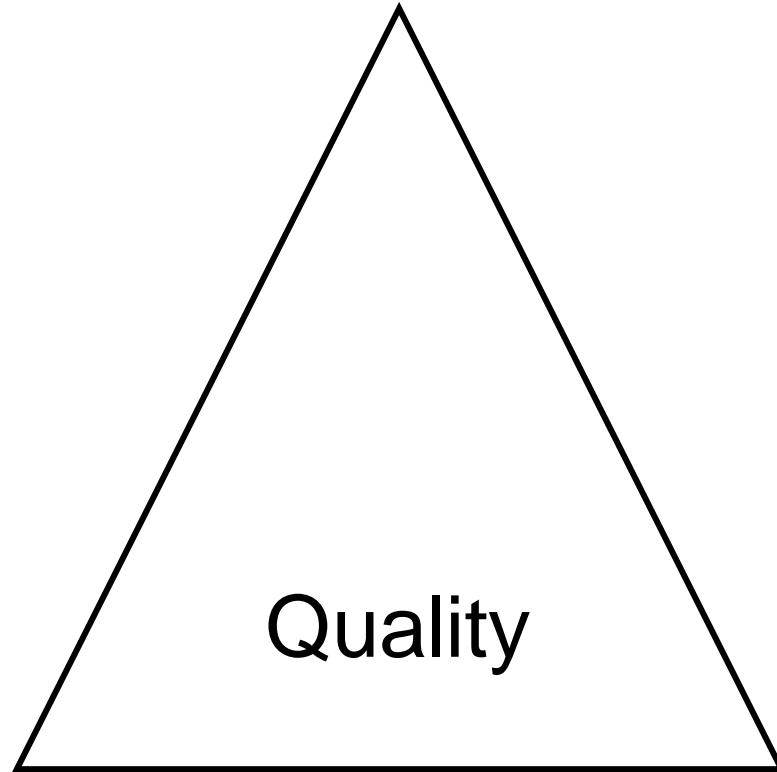
- <http://guide.agilealliance.org/guide/timebox.html>:
 - A timebox is a previously agreed period of time during which a person or a team works steadily towards completion of some goal. Rather than allow work to continue until the goal is reached, and evaluating the time taken, the timebox approach consists of stopping work when the time limit is reached and evaluating what was accomplished

TB1	TB2	TB3
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- Ways to manage risks
- Fast response
- Makes requirement management more rigid

Iron triangle

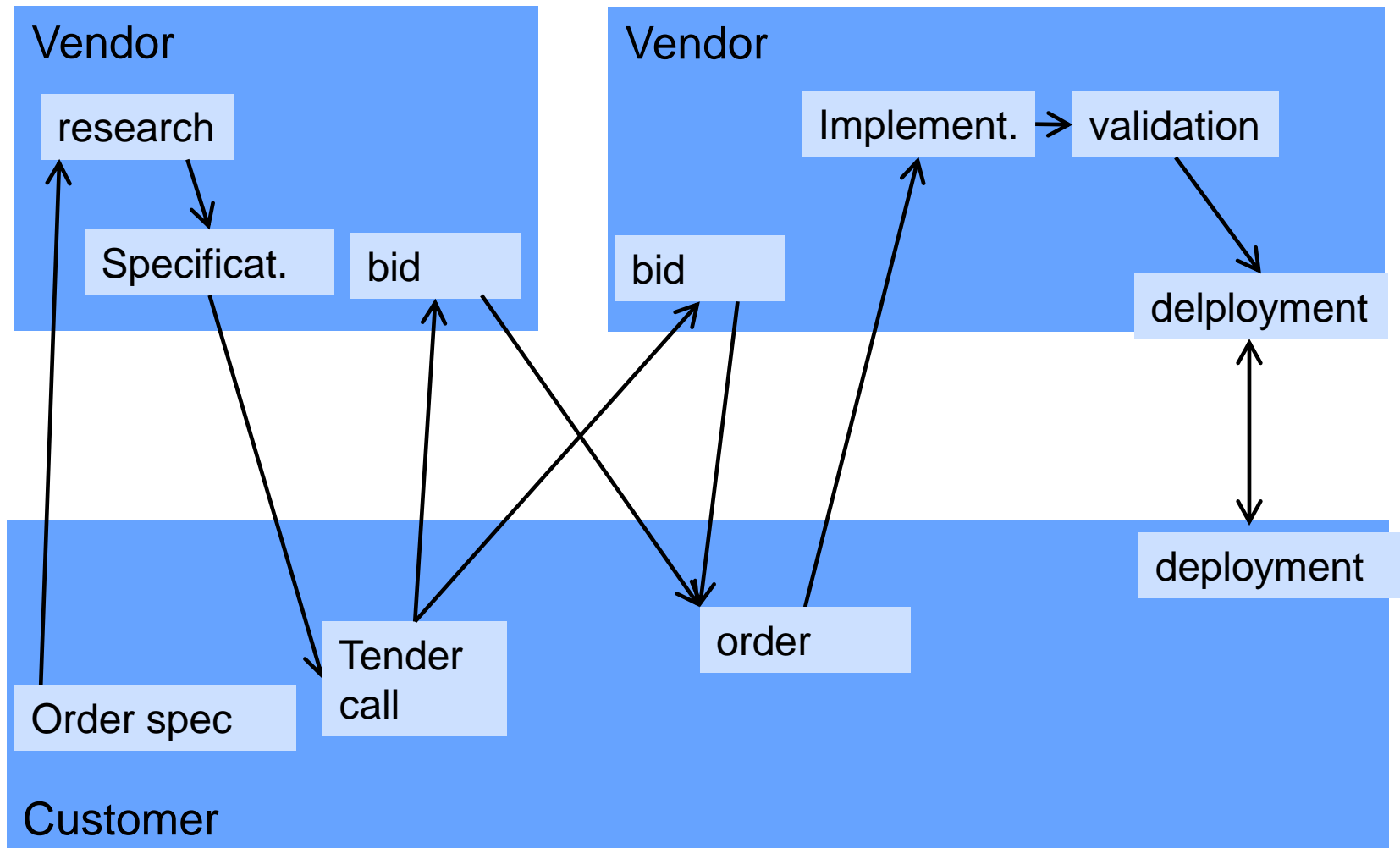
Scope/features



Time/
Schedule

Resources

Different project – customer specific



Learning goals of today

- What is project – especially in the scope of software
- How projects should be planned, tracked, managed and ended.
- What is difference between projects and process-models.
- Management aspects of process models
- Agile does not mean that project planning or management is not needed.

Initial content of lectures

- Introduction
- Life-cycle models, their background
- **Project management, product management, project planning – in general management aspects**
- Scrum in details
- Kanban, Customer Development and DevOps details
- Requirement definition, requirement management, requirements prioritization
- Version management, configuration management, continuous integration
- Architecture issues, role of architect, architectural quality attributes, product families, (TIE-21300 will go deeper)
- Testing and quality assurance (TIE-21200 will go deeper)
- “Quality systems” and process improvement
- Embedded and real-time systems (other courses will go deeper)
- Safety-critical and dependable systems
- Effort estimation
- Software business, software start-ups
- Recap

Project

- Wikipedia (borrows):
In project management a project consists of a temporary endeavor undertaken to create a unique product, service or result.
- Oxford dictionary
an individual or collaborative enterprise that is carefully planned and designed to achieve a particular aim.

Key elements for this lecture

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A project

Has

- Start
- End
- Goals

Should have

- Plan
- Success criteria
- Management

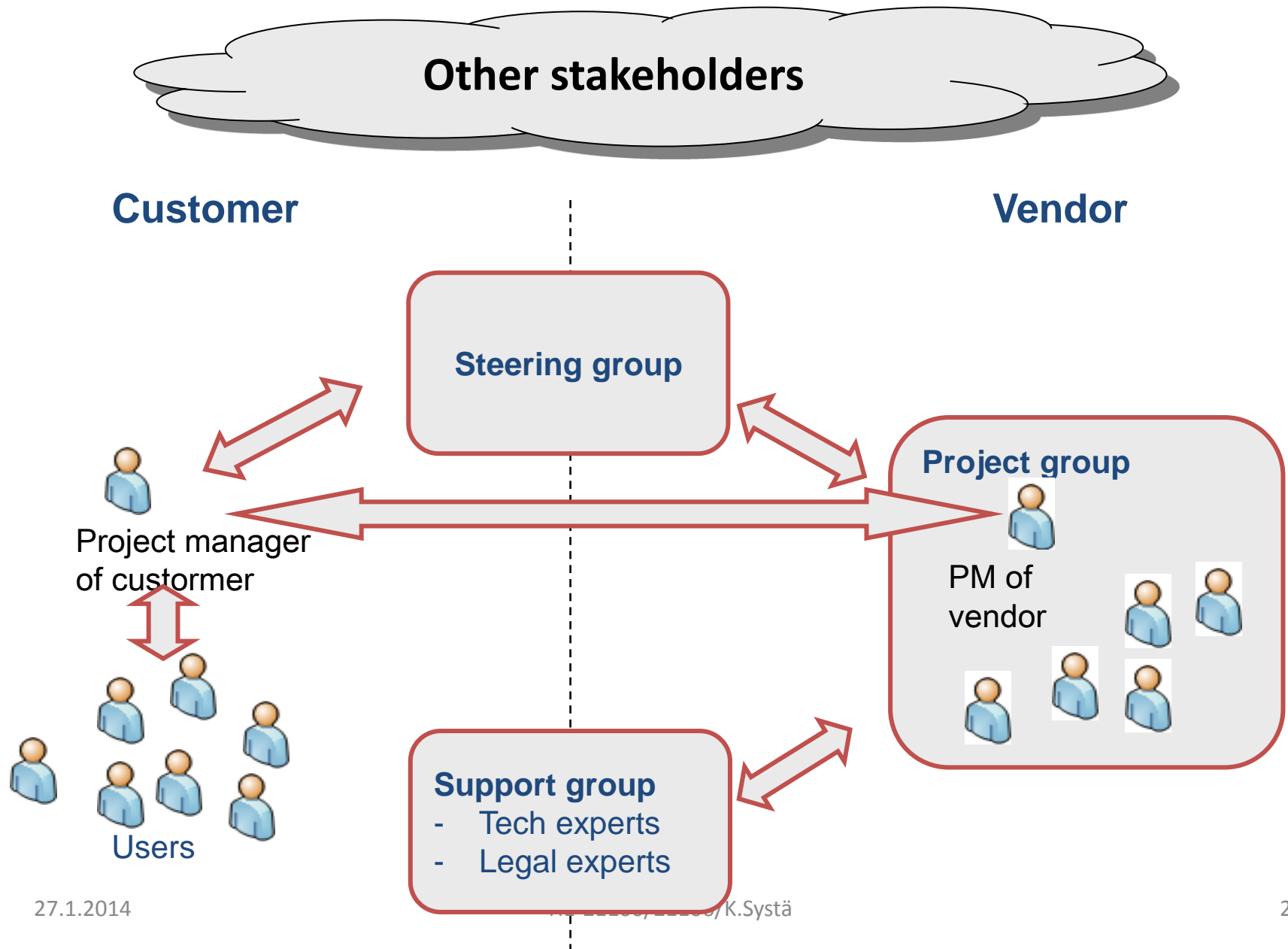
Project management aims at

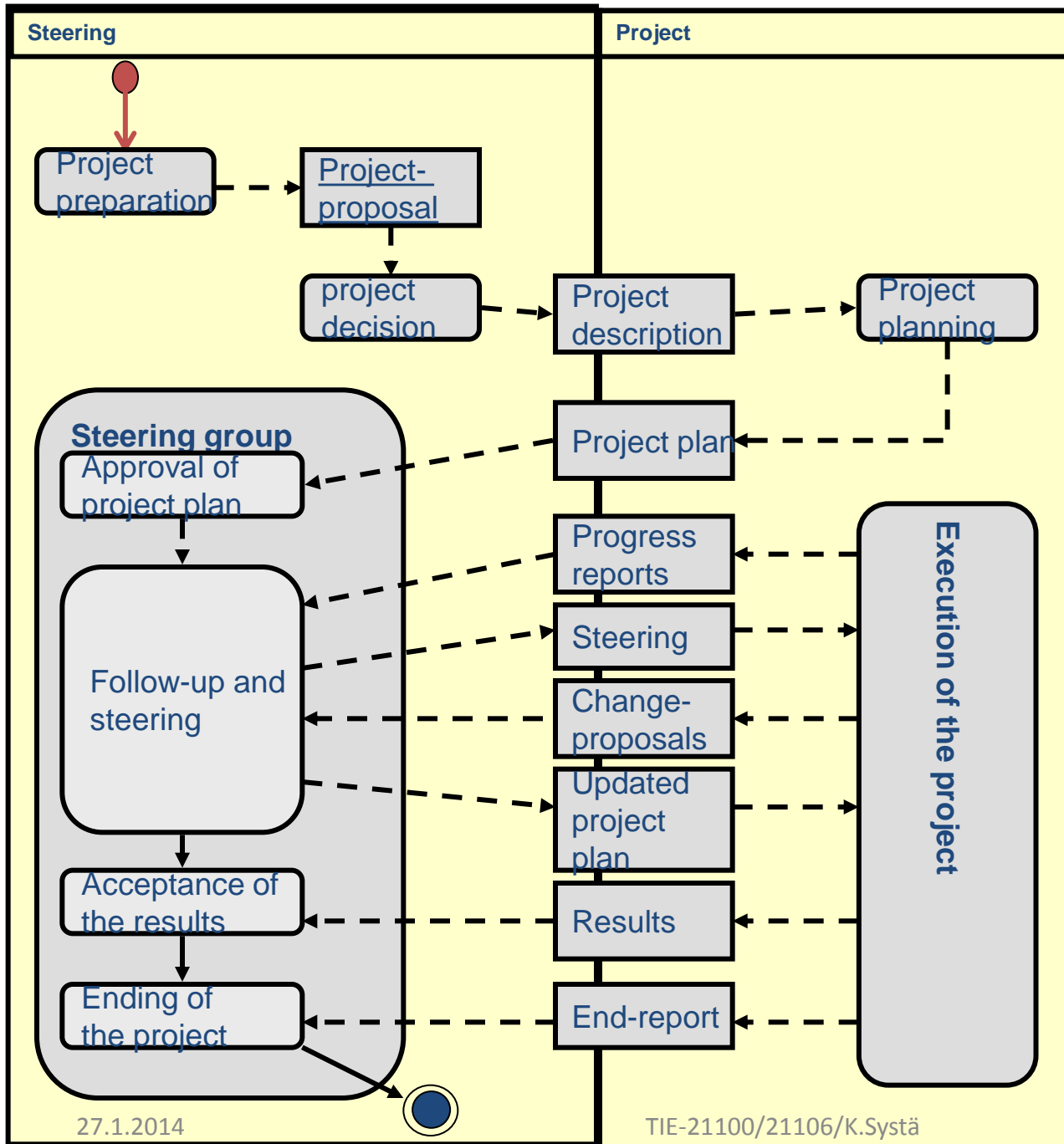
- Deliver SW to customer at the agreed time
- Keep overall costs within the budget
- Deliver software that meets customer's expectations
- Maintain spirit and performance of the team

Special about software projects

- The product is intangible
 - Unlike buildings it is hard to tell condition and phase of development
- Large software project are often one-off projects
 - Hard to repeat experience
- Processes are variable and organization specific

Project organization (traditional)





QUESTION 1:
Where do this conflict
with agile methods?

ANSWER:

Do not need to
conflict much

- Agile method concerns execution
- Applied method is agreed in the plan

However note that customer (or somebody representing customer) is more involved in agile projects

Project planning

- Organization
- Target setting
- Risk analysis
- Selection of technologies, methods, practices, tools
 - For instance if agile is selected
- Support (dokumentation, quality assurance, product management)
- Splitting and phasing
(WBS = Work Breakdown Structure)
- Worktime estimation
- Resource availability and time table
 - Developers, external experts
 - Special tools
- Budget, financing, funding
- Success criteria

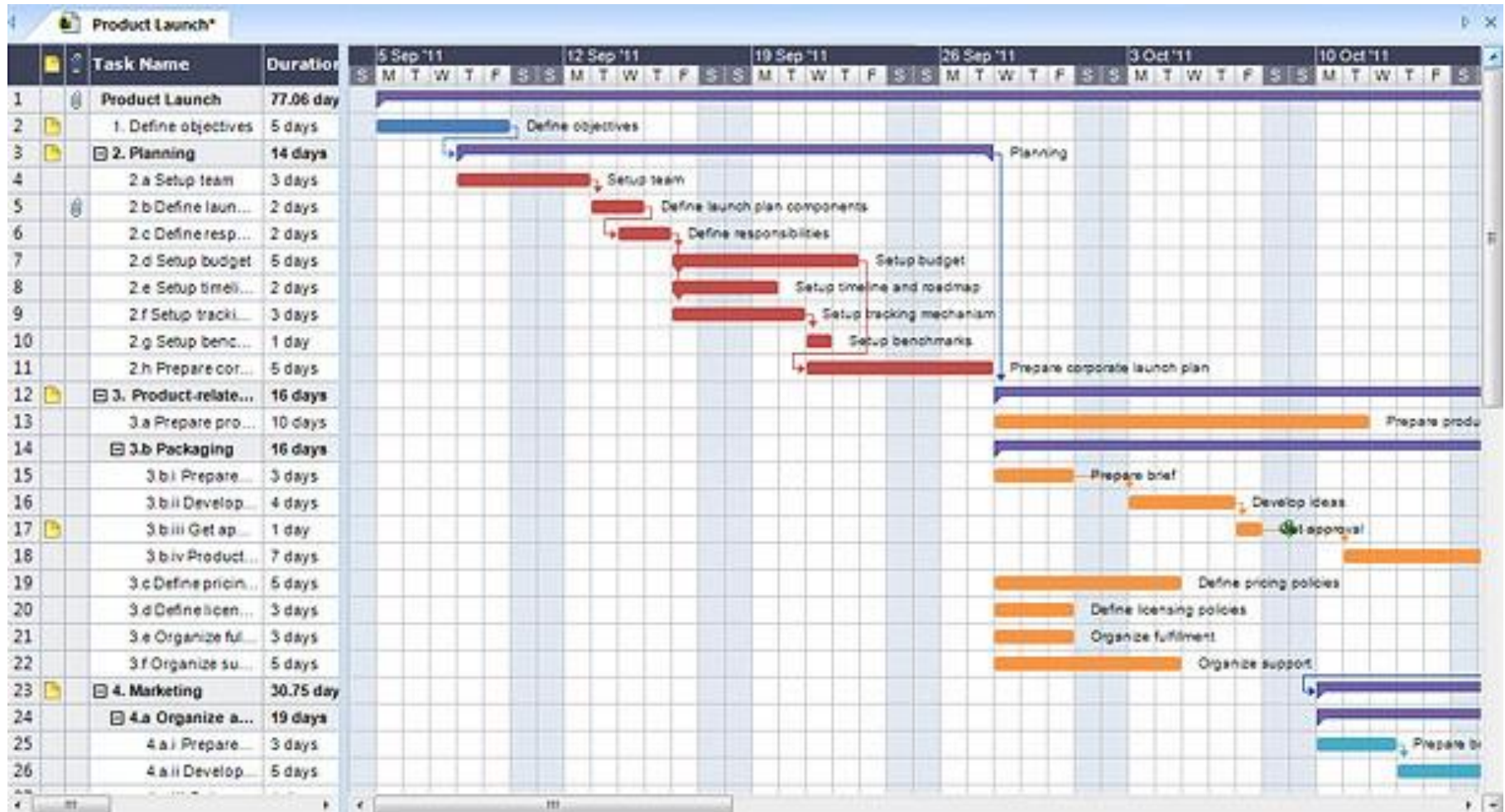


Project plan template

- Walkthrough of the template for our project course:
- http://www.cs.tut.fi/~projekti/TIE-PROJ_project_plan_2013.odt

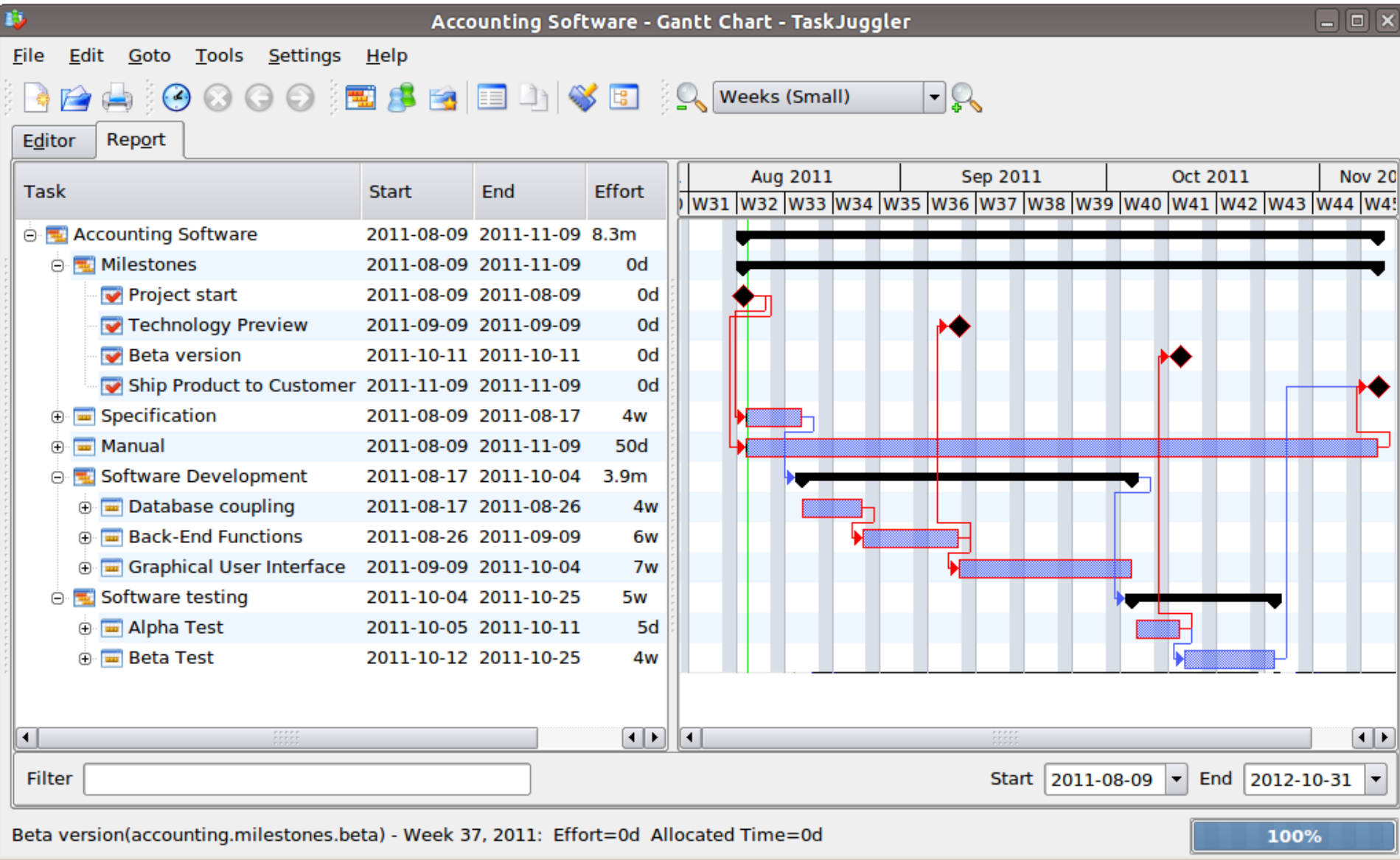
Gantt – charts

(lähde: <http://www.matchware.com>)

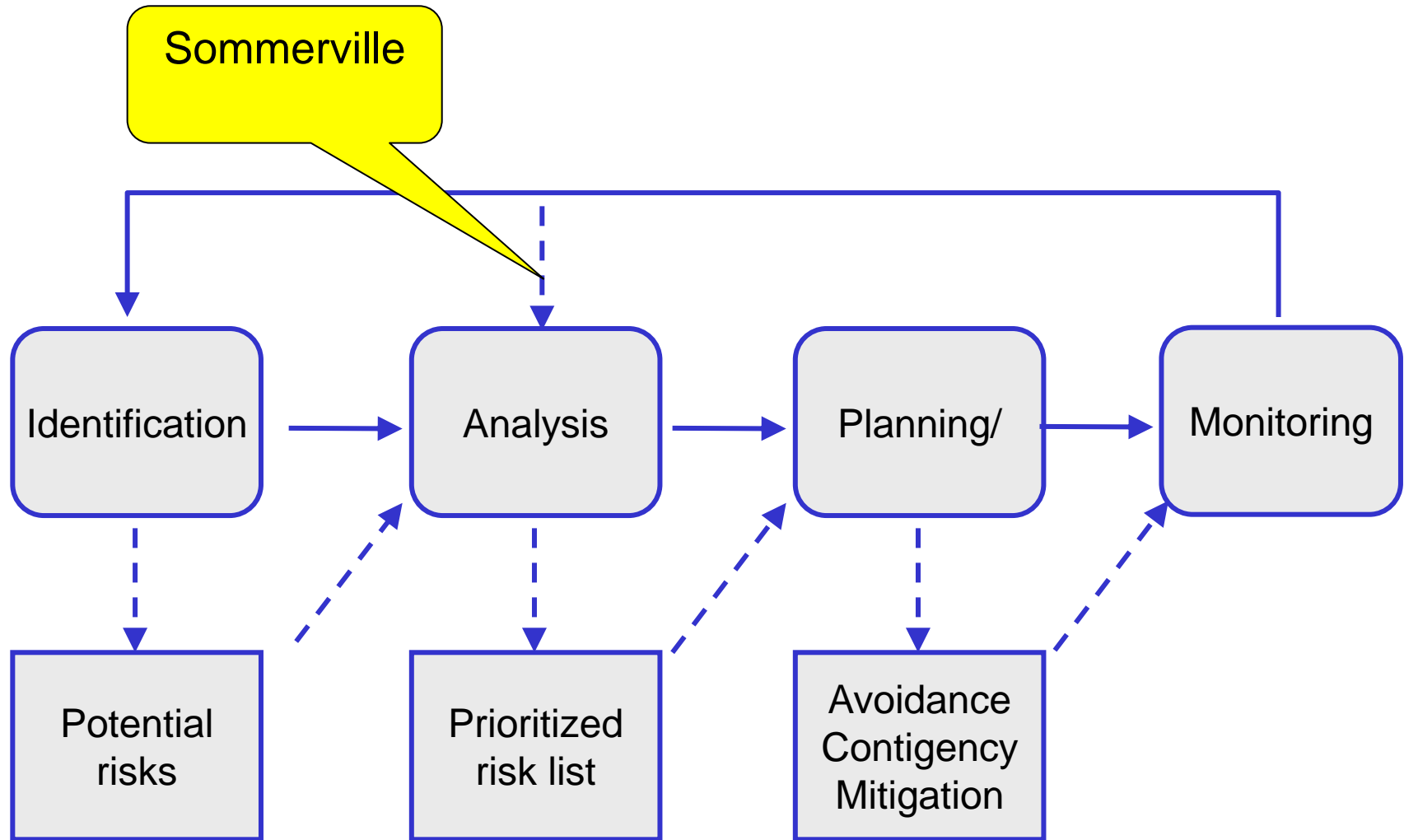


Another alternative

(Lähde: <http://orgmode.org>)



Risk management



Risk types

- Product
 - Technology risks
 - Used SW, HW,
 - Requirement risks
 - Estimation risks
 - Tool risks
- Project
 - People risks
 - Key personel leave the company
 - Sudden illness
 - Organizational risks
- Business

A very common approach for analysis and planning

- Probability of the risk
- Severity of the risk

⇒ Priority

Plan

- Ways to avoid the risk
- Ways reduce probability of the risk
- What do if the risk is realized (action)
- How we minimize the consequences in advance

Simple table

RISK	Probab.	Severity	Prevent	Reduce
Key person leaves	50%	8	Keep people happy. Give a raise.	Ensure that all critical data and skill is possessed by more than one.
...
Nuclear war	<0.001%	10	Attend peace campaign	Move the office to a bunker



Often better to use

- low
- medium
- high

Reasons for one big project to fail

- The size and features of the result were impossible to estimate during planning
- The result was much bigger than originally planned
- There was a constant flow of changes: features were added and removed
- Coordination between sub-projects was mostly non-existing
- Terrible hurry during the last phases of the project

More reasons

- Close to end project manager got sick and replaced by unexperienced person
- Many features and technologies were new and never tested in similar products.
- System testing showed that the system is not stable, but because project was late it was deployed anyways.



more

- Afterwards it was discovered that the design could not work. The ship would have been stable only with so much of weight that some guns had been under water surface.
- Reference; Curt Borgenstam: Why the Wasa Capsized.

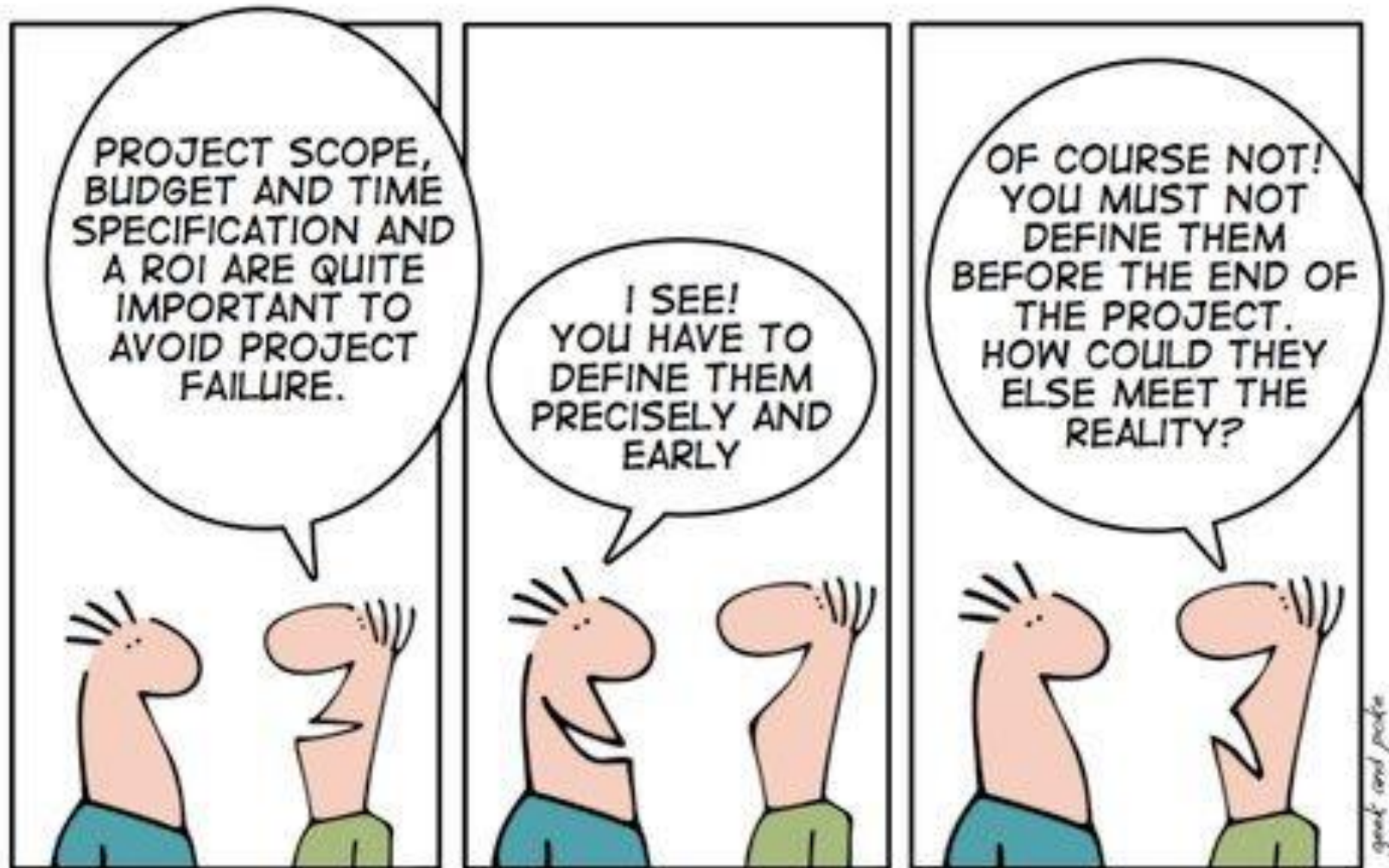
Stakeholder analysis (not in the books)

- To figure out the environment of the project and product for **planning, risk management, requirements management, training and deployment**
- Especially important if the project somehow changes the ways of working in the customer organization
- Should include information about all who have a "stake":
 - For example, users, interfacing departments, authorities
- Description
 - Name
 - Role and influence
 - Also: goal, expectations, responsibilities,
 - Importance
- It may be difficult to connect all stakeholders or their representatives
- Goals of stakeholders might be conflicting or even against the project

Why project plan is important

- It is a tool for steering and tracking
- Communication tool among the stakeholders
 - Goals
 - Tasks and timetable
 - Organization and responsibilities
 - Tools, working practices
 - Budgets
 - Risks

<http://nadihassan.wordpress.com>



ONE YEAR IN A IT PROJECT - DAY 3:
HOW TO AVOID PROJECT FAILURE

A few words about project management and agile

Five principles of Agile

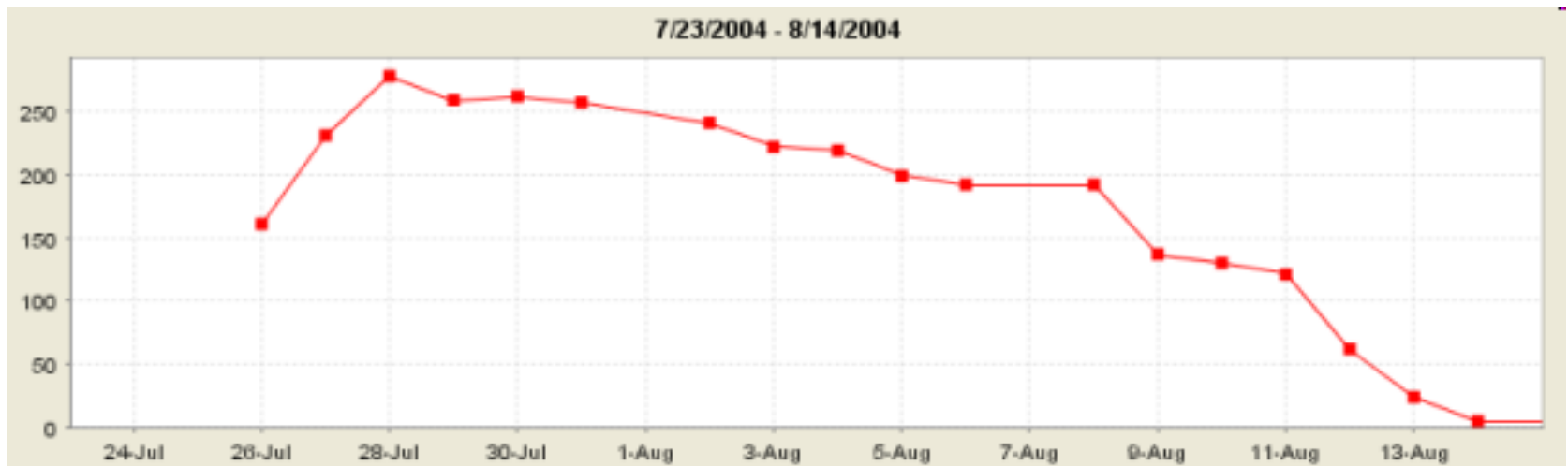
Customer involvement	Through the project. Provide and prioritize requirements, evaluate iterations
Incremental delivery	Customer specifies the increments
People not process	Skill recognized and exploited; Team should decide on ways of working
Embrace change	Plan and design for change
Maintain simplicity	Both in process and software

But...

- Some things are not covered by agile methods
 - Stakeholders
 - Budget
 - Risks
 - High-level goals
 - Risks
- Some things need to be agreed on
 - Timing of sprints
 - Who participate in sprint review
 - Who takes the roles
(in Scrum: Scrum master and product owner)

Agile improves visibility to management

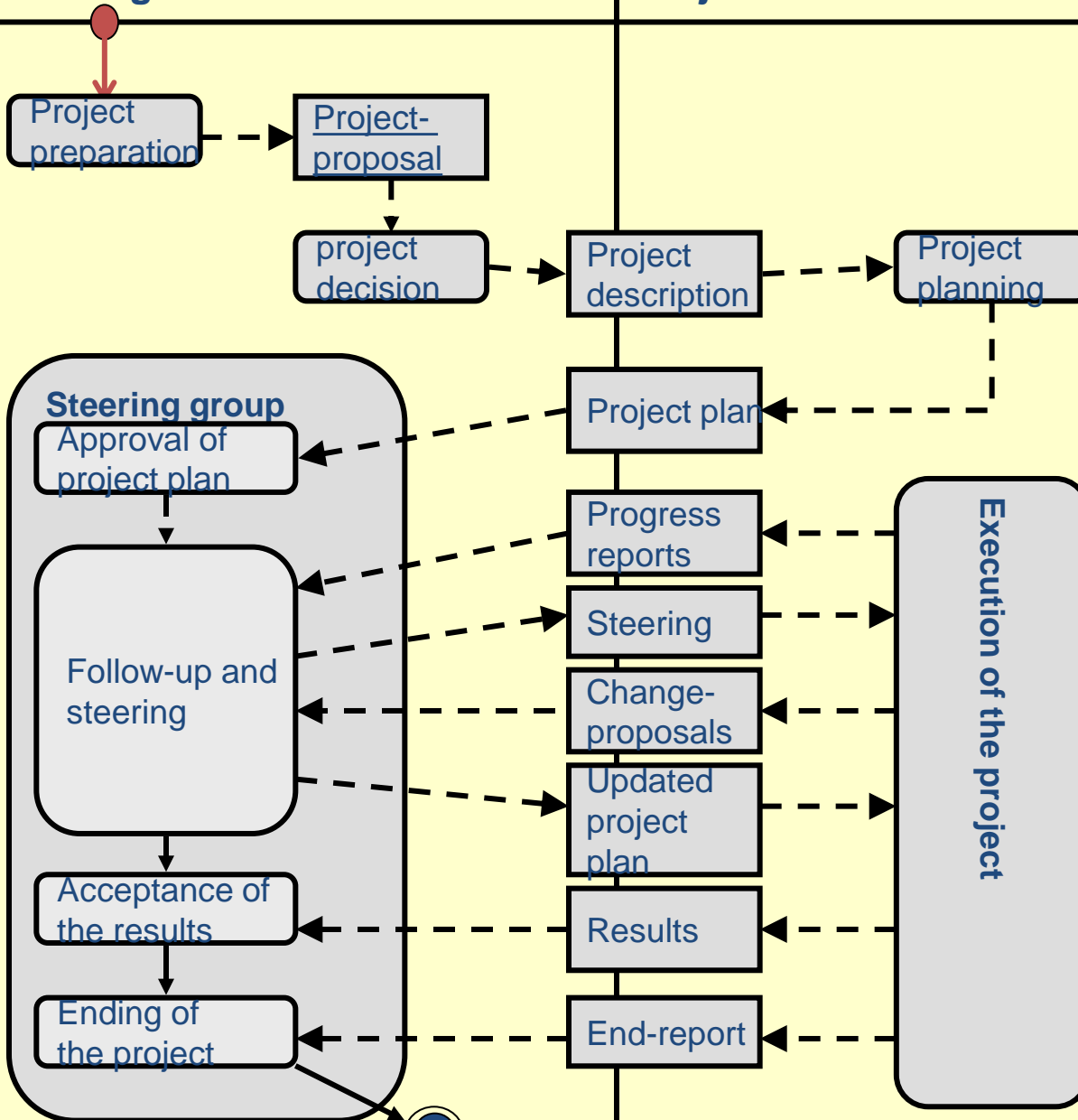
- Important argument for selling the idea of Agile
- Each sprint provides an opportunity to see the progress
 - Steering group or management may ask a status report
(but status reporting and sprint rhythm should be synchronized)
- Example: burn-down charts



Steering

Project

Customer



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