

Project Management

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Agenda

- Objectives for this lecture
 - What a Project is and what the tasks and responsibilities of the Project Manager are
 - In what environment Projects exist, i.e. different organizational designs in software companies
 - Traditional Project Management approaches and planning
 - Project management triangle in Agile
 - Project types and Agile

Projects

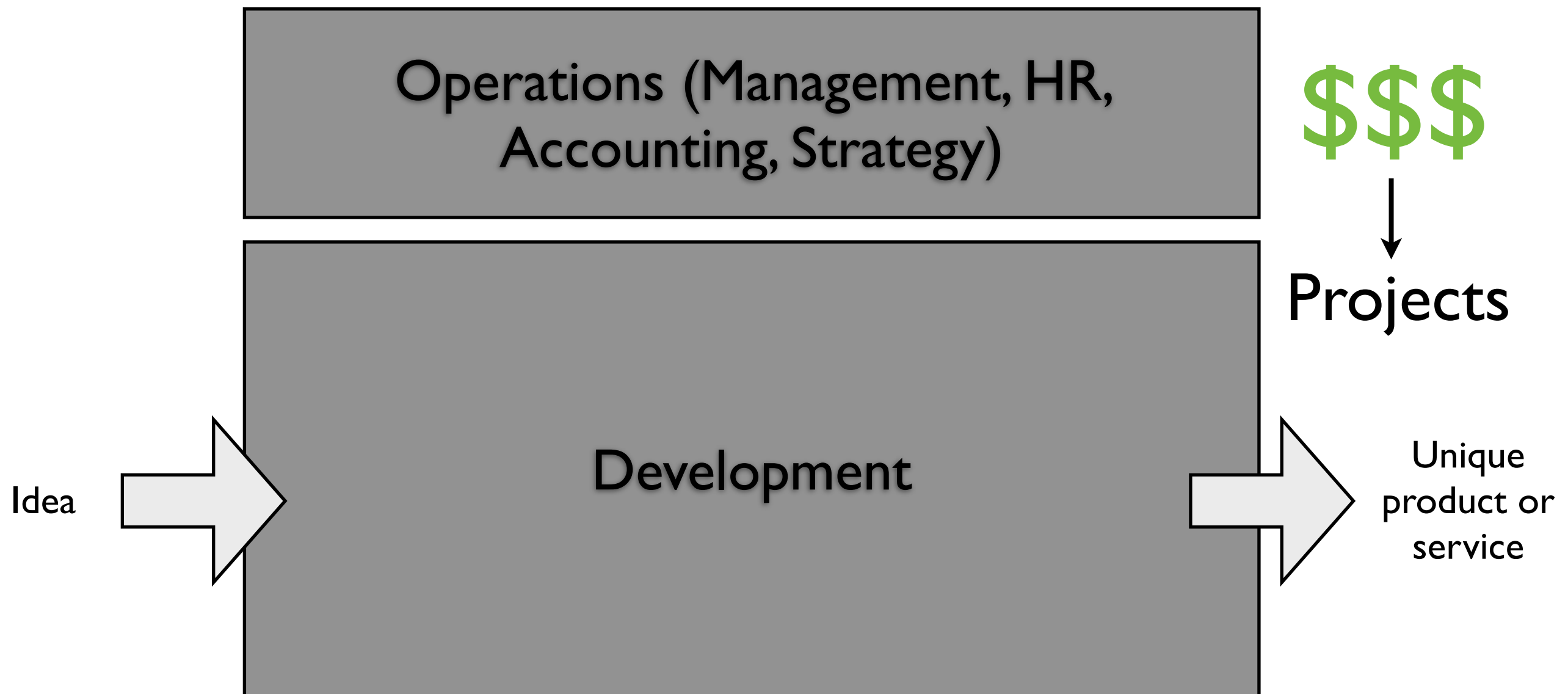
- A planned undertaking to reach of one or several objectives
- Is temporary, all projects have an ending (as opposed to operations, e.g. accounting)
- Creates a unique deliverable

Project Management

- Plan, organize, motivate and control a project
- To reach the project's objectives within the project's constraints
- To optimize the effort vs. output
- I.e. Deliver the product to the customer on time and within budget

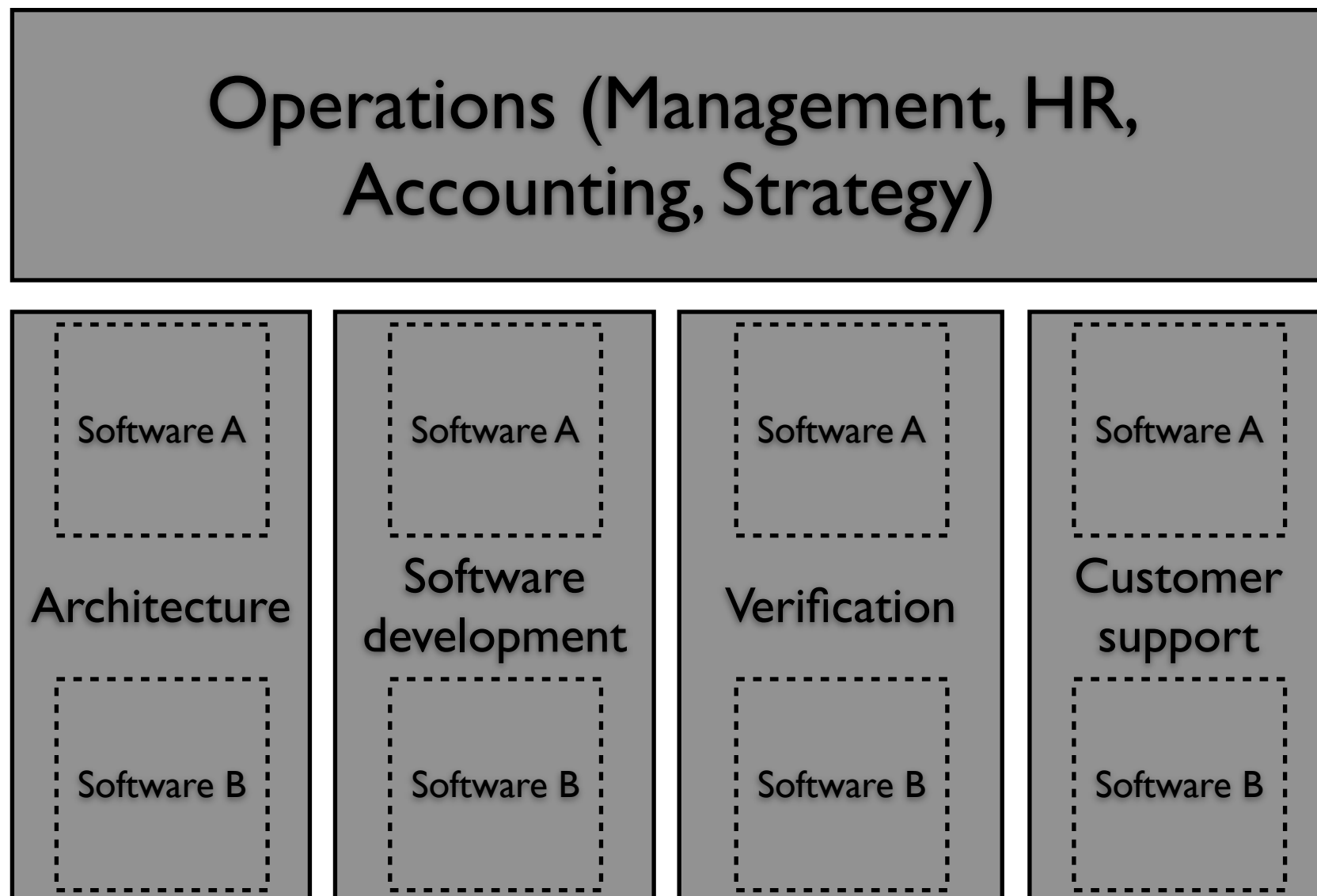
Organizational Basics

Basic Software Co.



Functional Organization

Basic Software Co.



Divisional Organization

Basic Software Co.

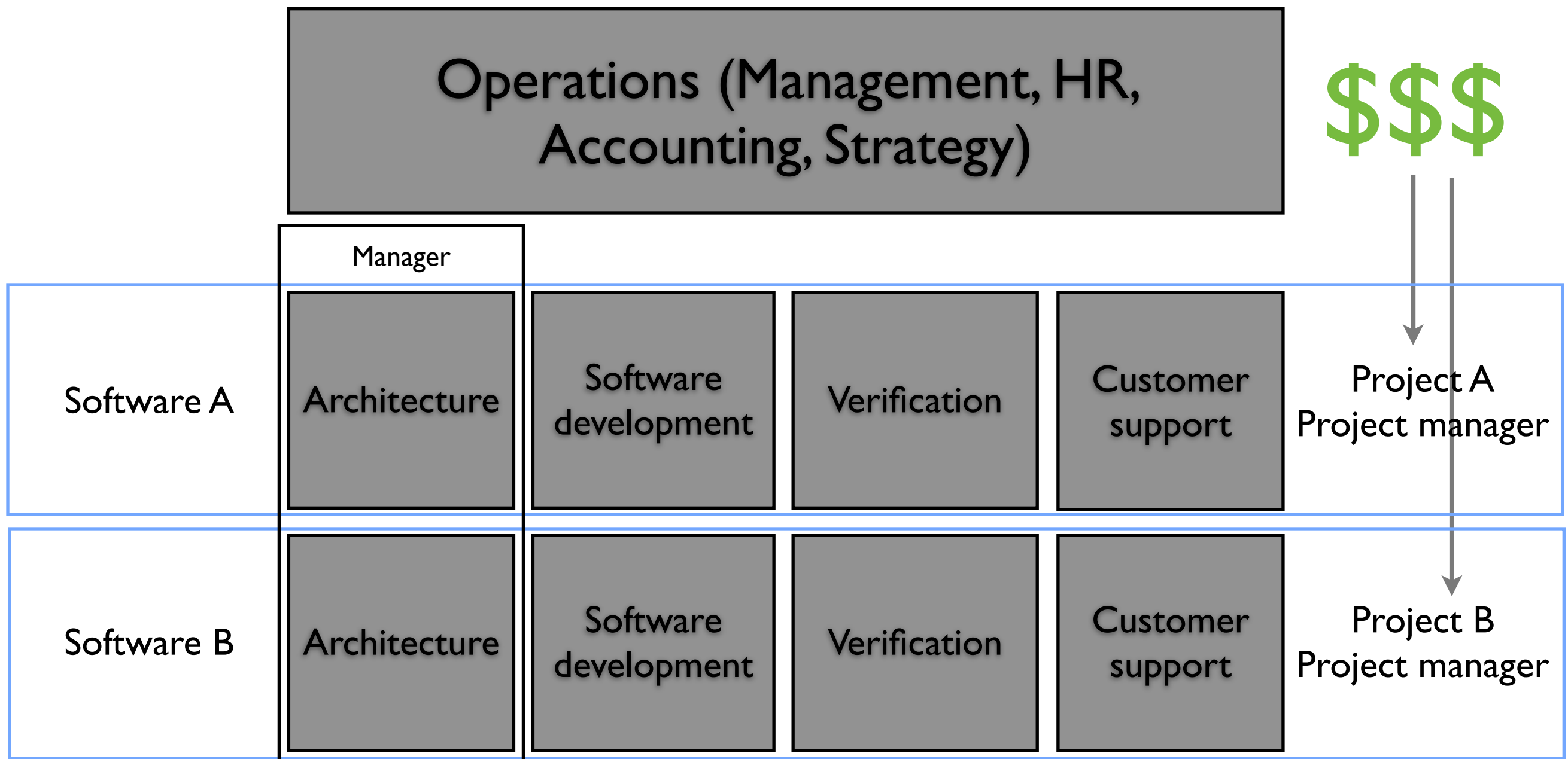
Operations (Management, HR,
Accounting, Strategy)

Software A
(architecture,
design, verification,
support)

Software B
(architecture,
design, verification,
support)

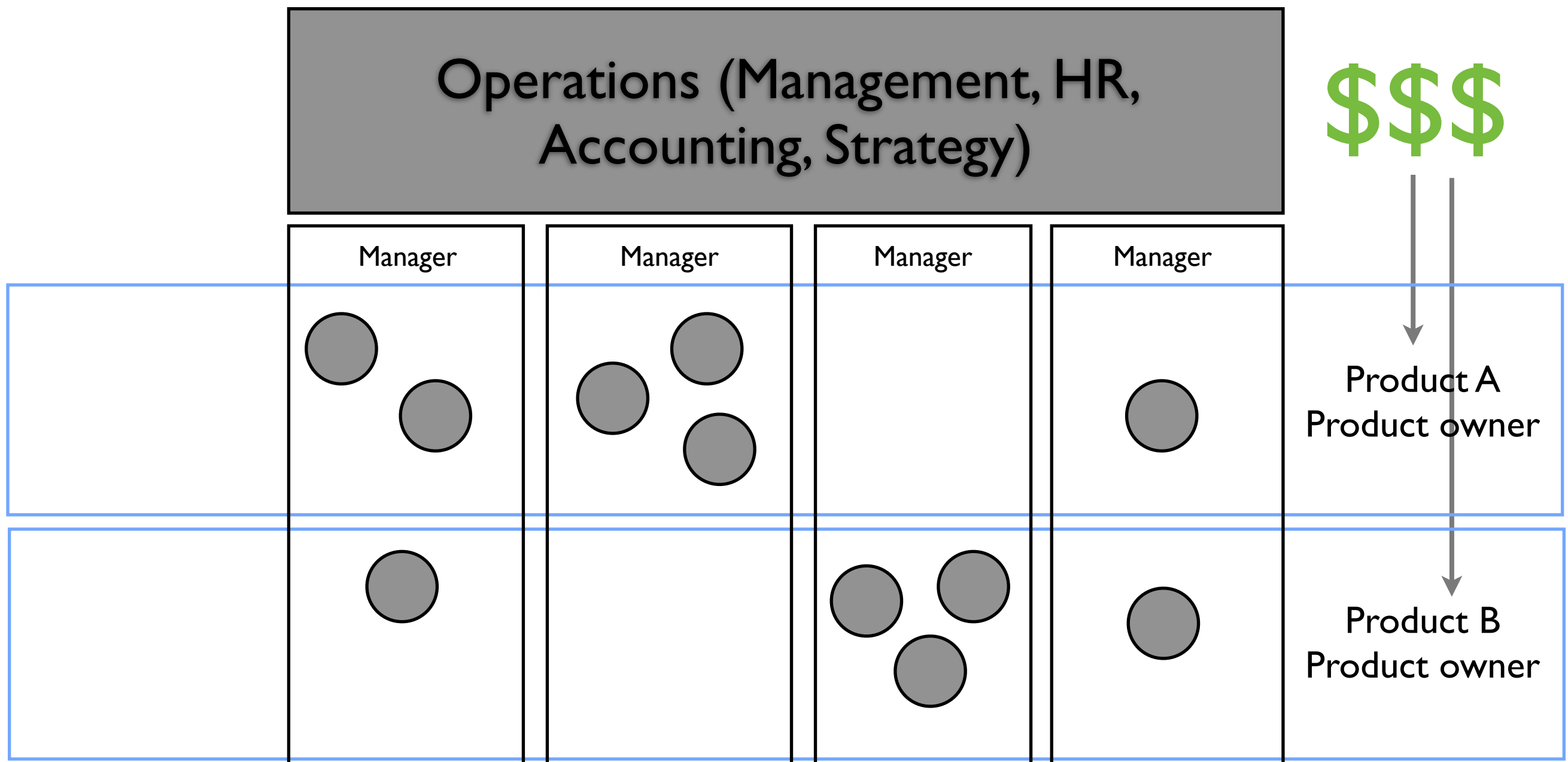
Matrix Organization

Basic Software Co.



Team oriented (Agile) Organization

Basic Software Co.



Traditional Project Management Approaches

- Waterfall
- Critical Chain

Traditional Waterfall

Requirements

Design

Implementation

Integration

Test and debug

Release

Maintenance

- Originates in manufacturing and construction where changes are expensive
- Each step should be completed before moving to the next
- Bugs or design flaws found early in the projects are cheap to fix
- Structured and focus on documentation makes it easy to spread information
- Functional or matrix organization
- Reality is seldom as predictable, and it was actually presented as a flawed model for software projects..

“Waterfall” in practice

Requirements

Design

Implementation

Integration

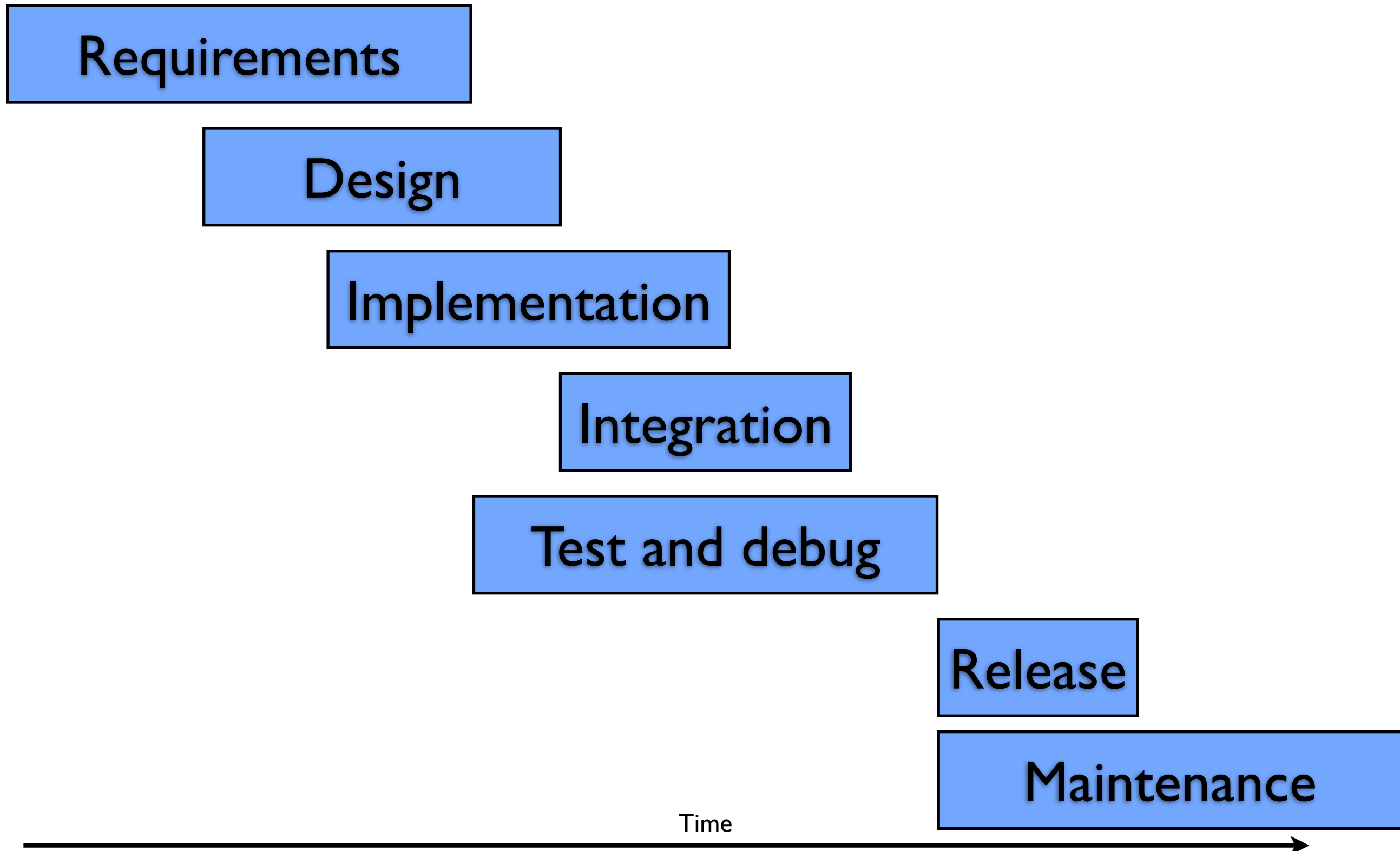
Test and debug

Release

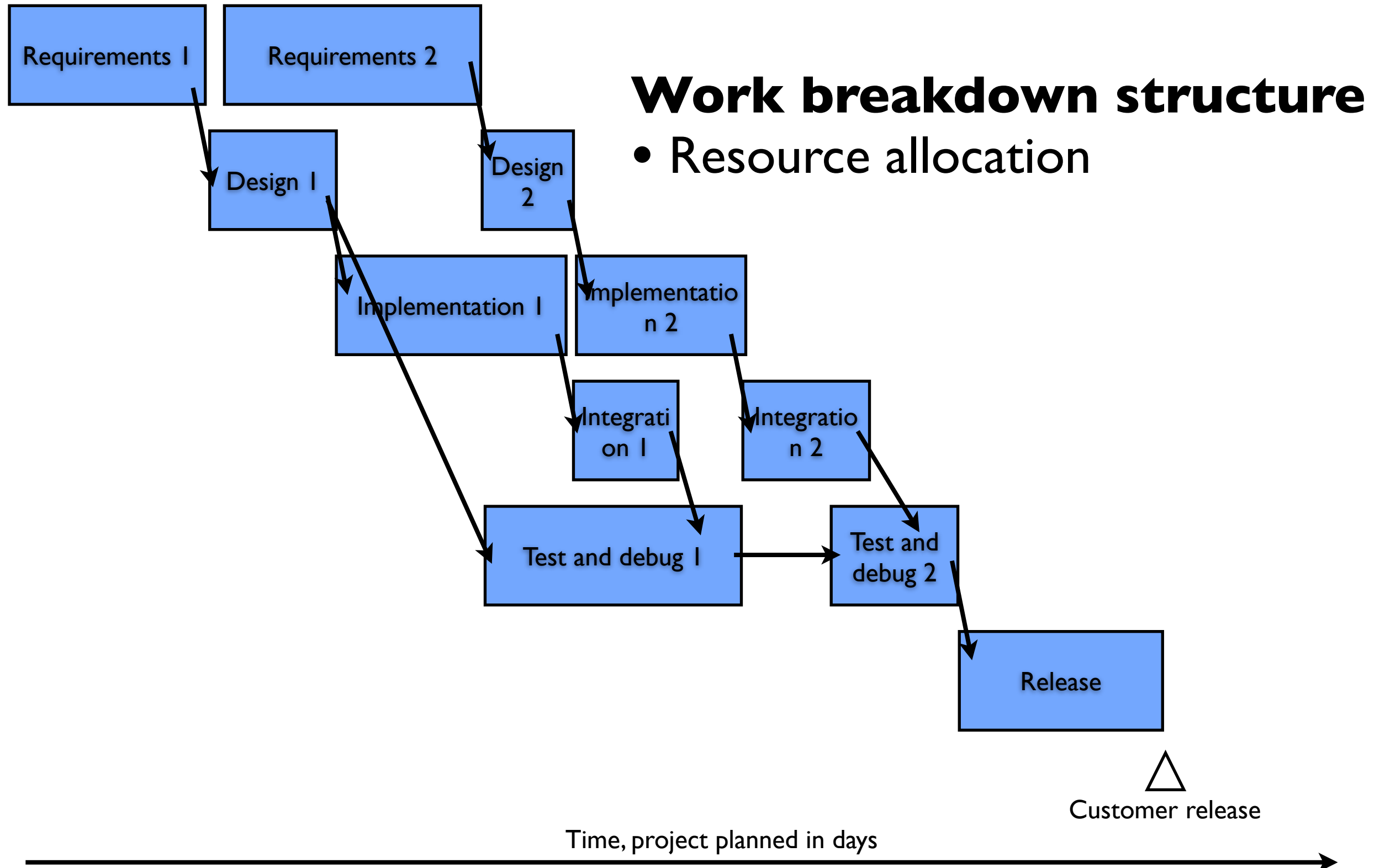
Maintenance

- Design, implementation, integration and verification is done during the execution phase of the project
- Project work is done in functional teams, coordinated by a project manager team
- Typically three or four releases are done to customer during a software project

Gantt chart



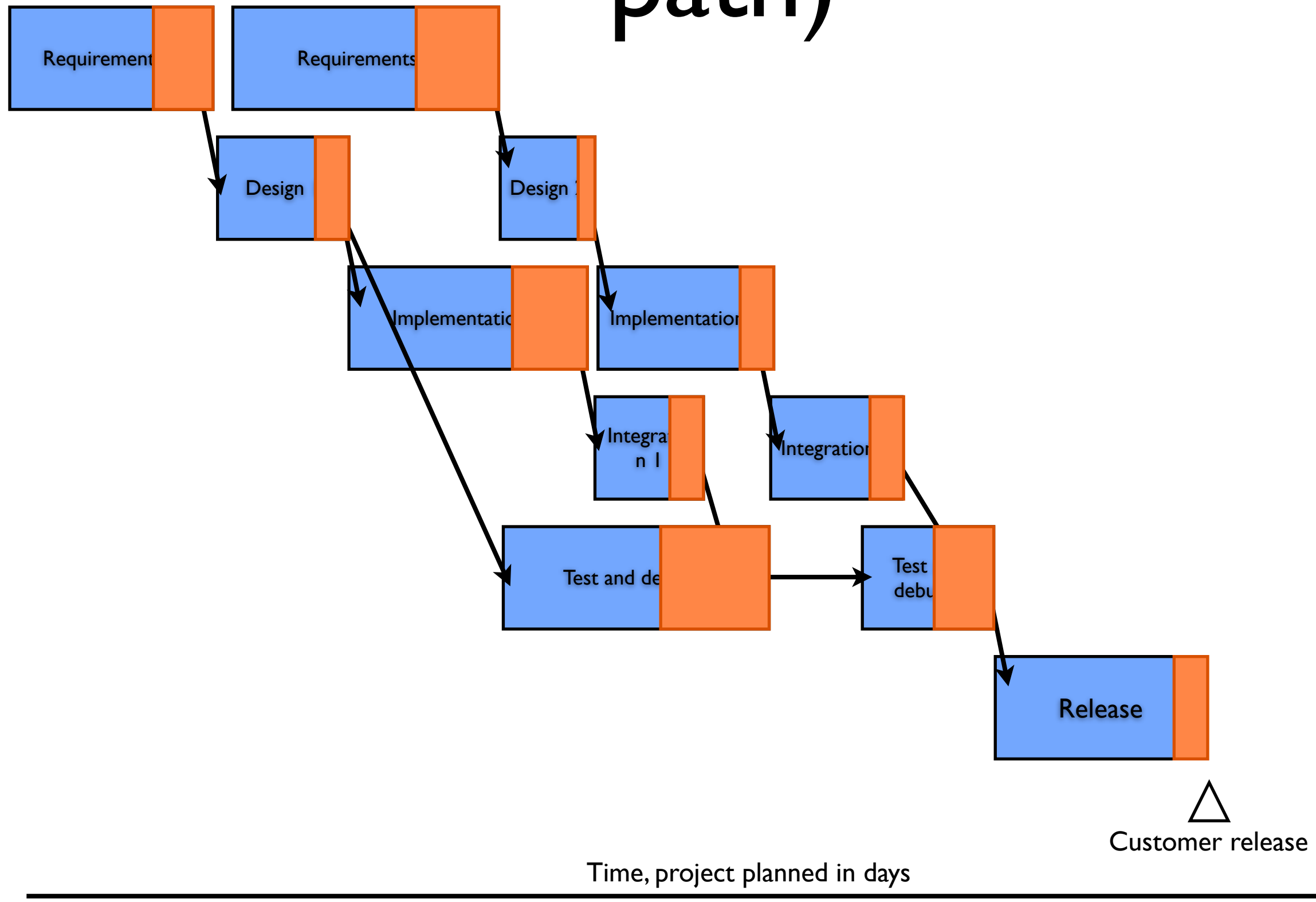
Gantt chart



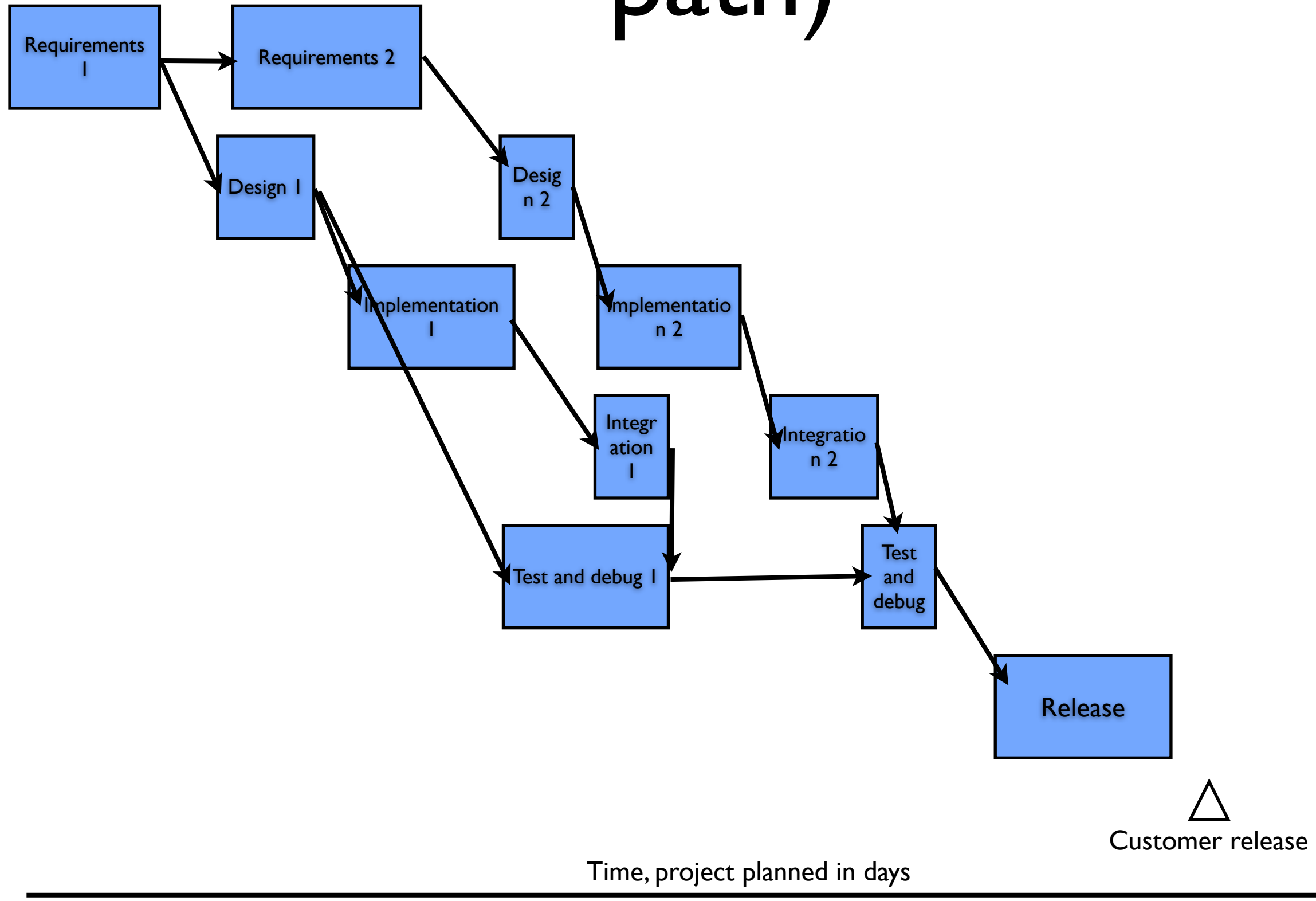
Gantt chart limitations

- Does not show how much work a box represents as the box only shows lead-time
- Complex plan for complex projects
- Delays may have huge impact on chart and real allocations
- If work is finished early, there is a tendency to wait until next activity is planned

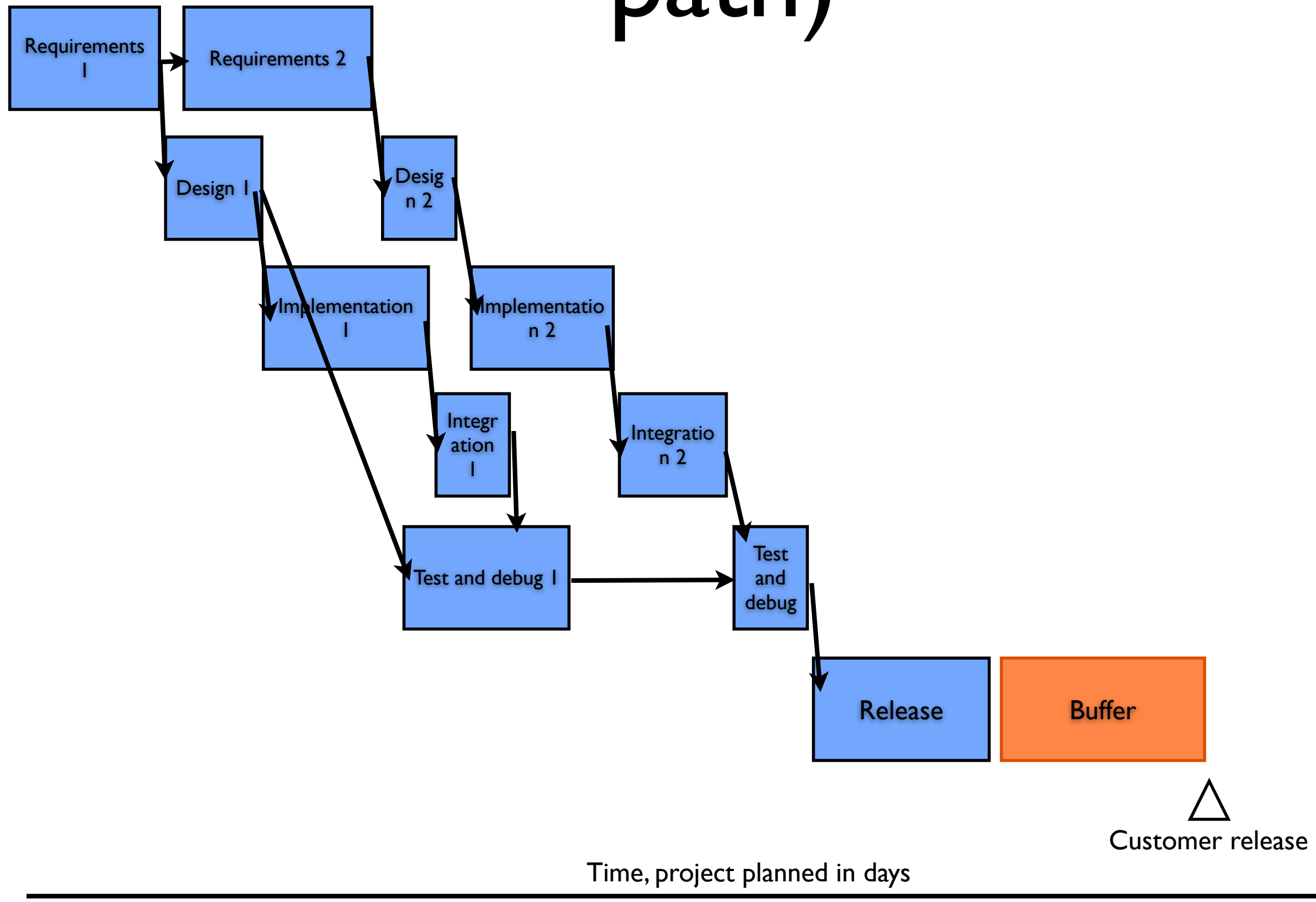
Improvements (e.g. Critical path)



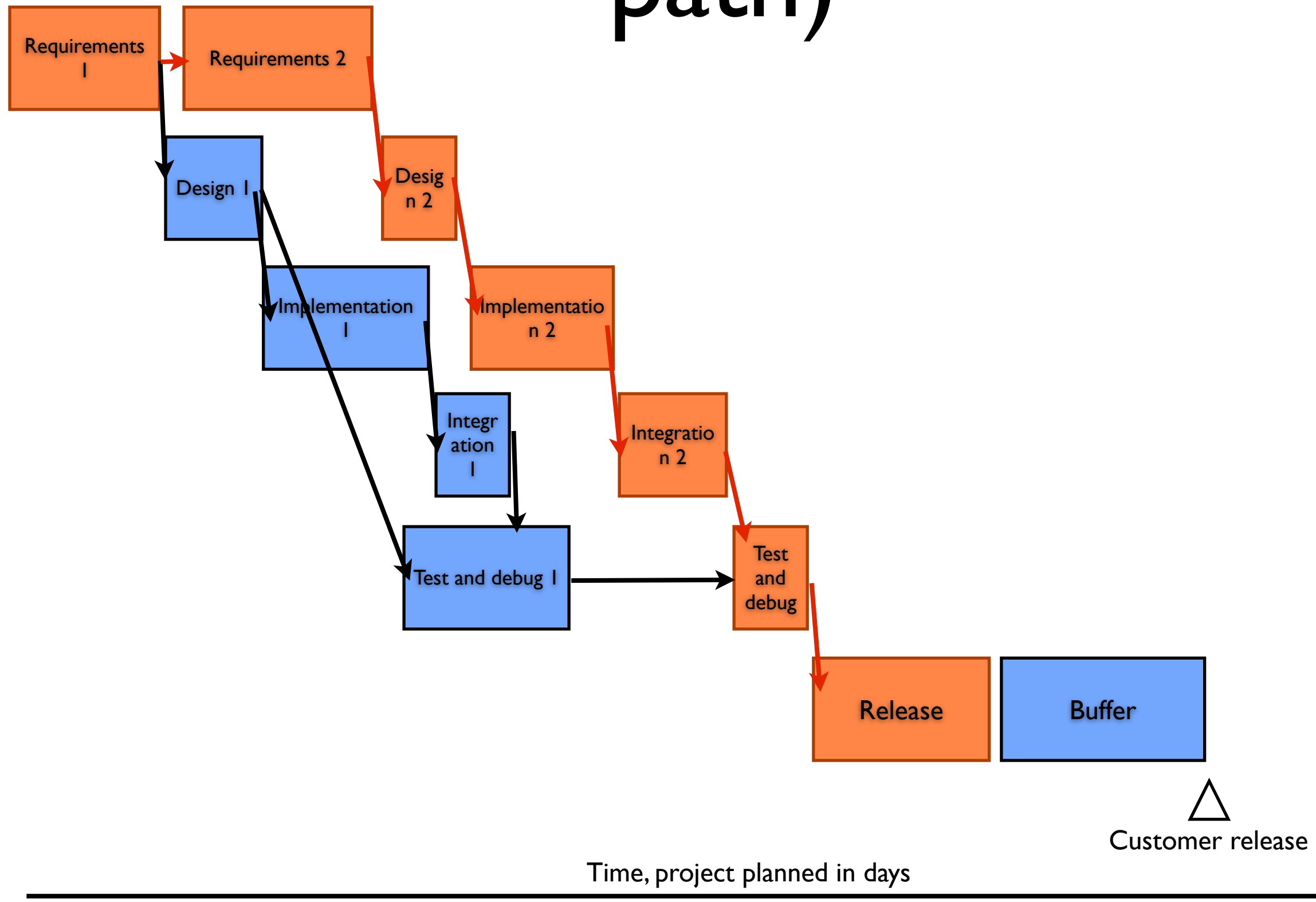
Improvements (e.g. Critical path)



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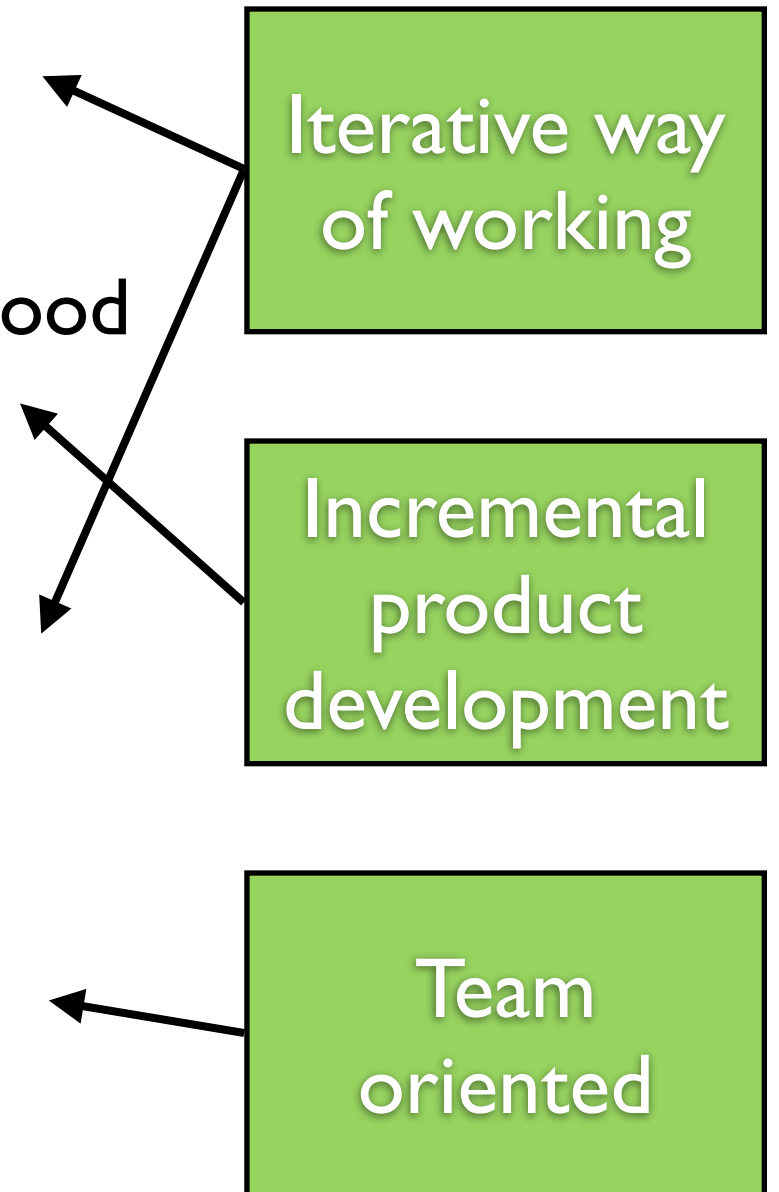
Project Reality

- Product requirements will change between specification of a product and delivery
- Humphrey's Requirements Uncertainty Principle: A system can not fully be understood before it has been used
- Ziv's Uncertainty Principle for Software Development: That uncertainty and unpredictability is always part of software development
- Wegner's Lemma: It is not possible to fully specify an interactive system

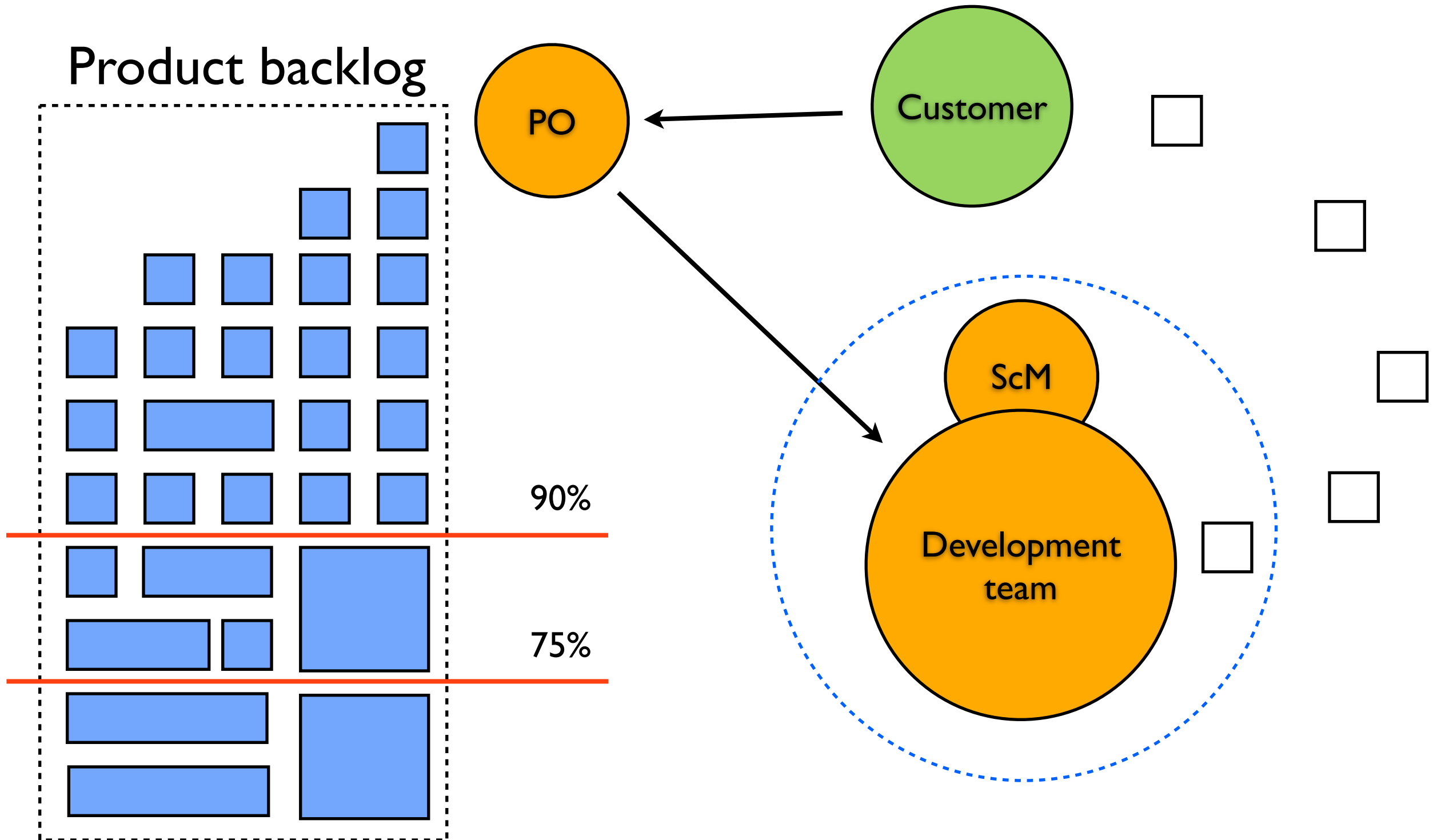
Iterative way
of working

Incremental
product
development

Team
oriented



Scrum (Agile)

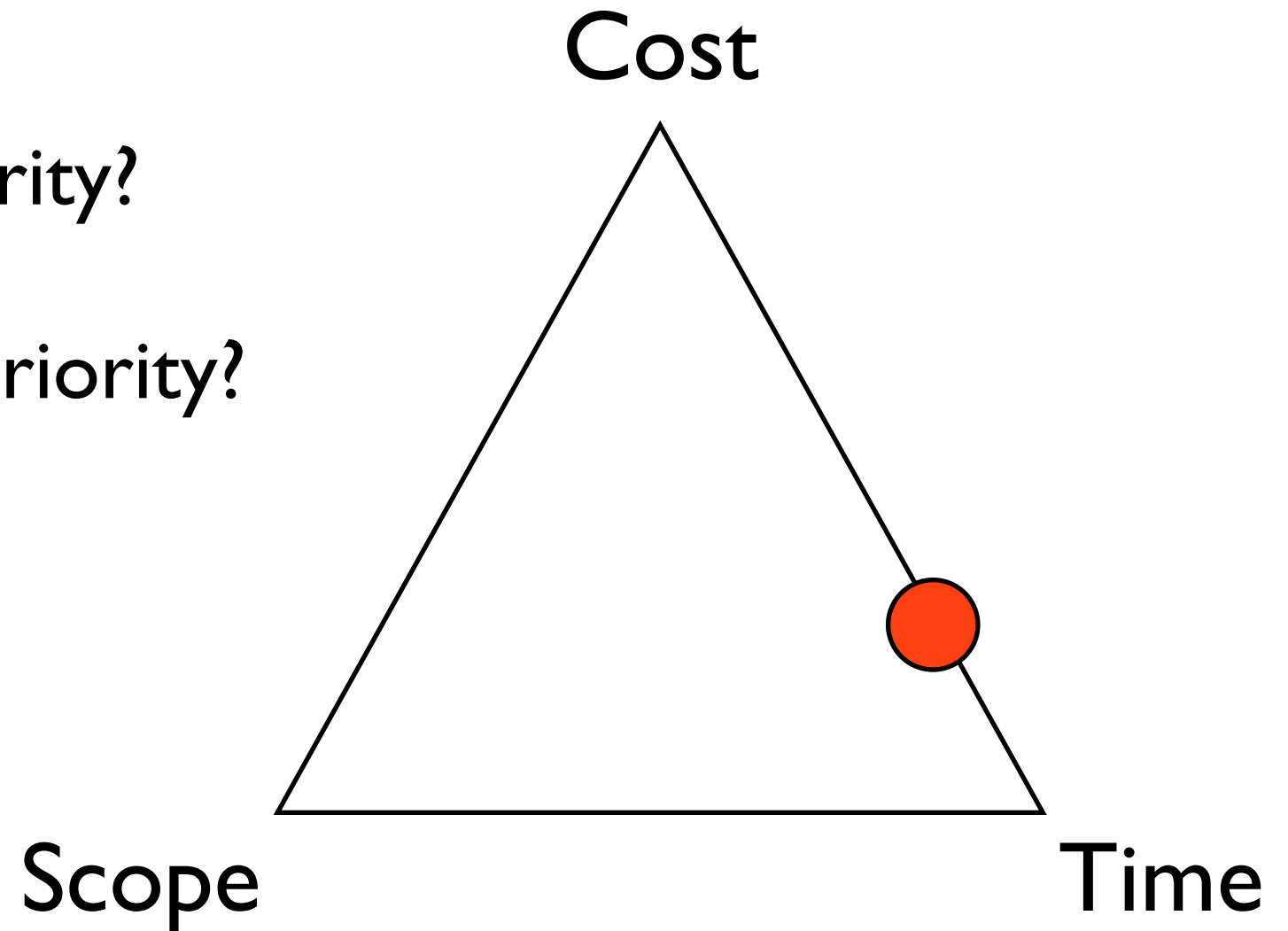


Project Management Triangle

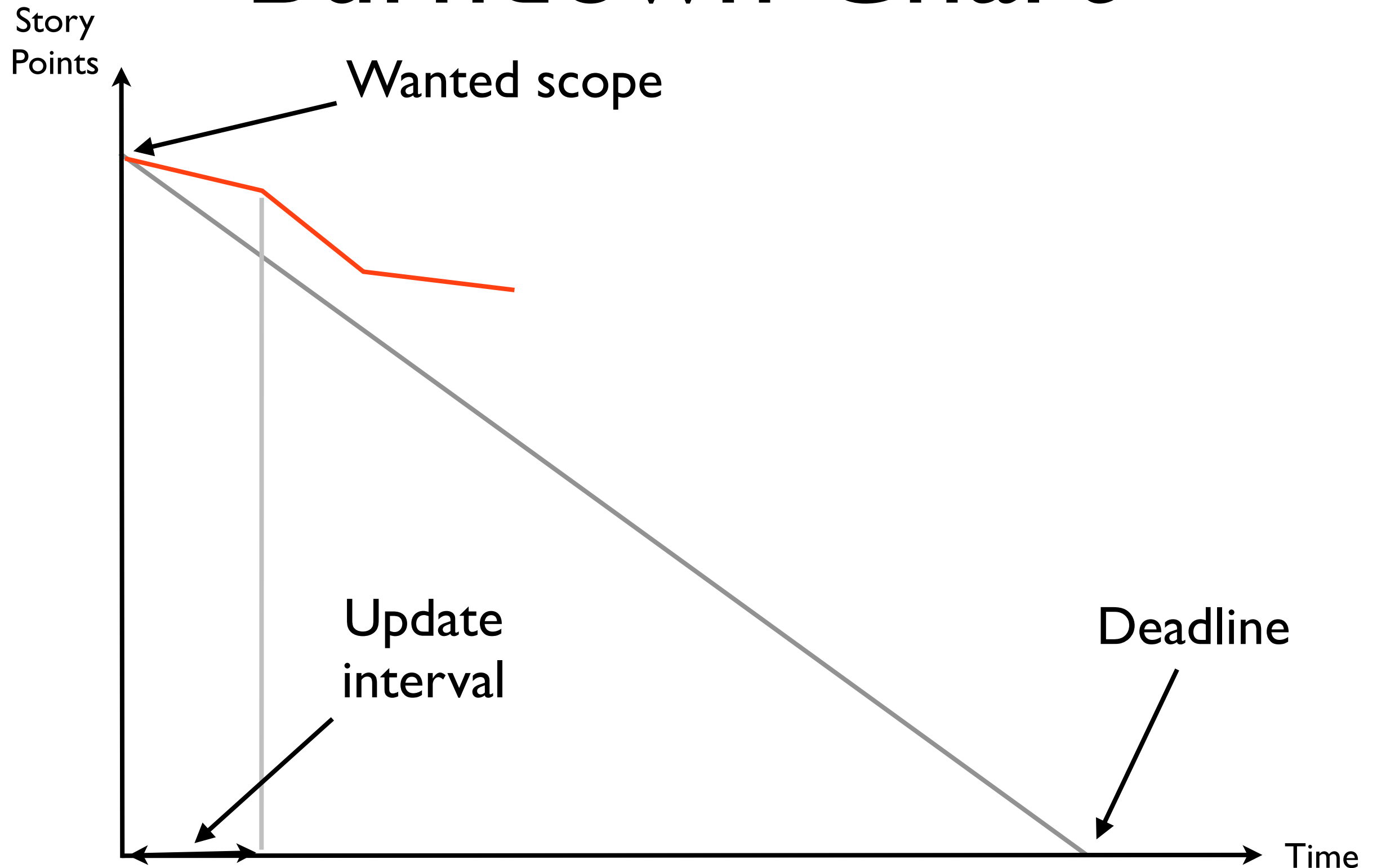
- Cost
 - The amount of money available for the project. Can be translated to both material (e.g. computers, lab equipment) as well as number of project members (employees, consultants)
- Scope
 - The deliverable's scope, i.e. number of features agreed with customer
- Time
 - The agreed delivery date of the finished product

Project Management Triangle

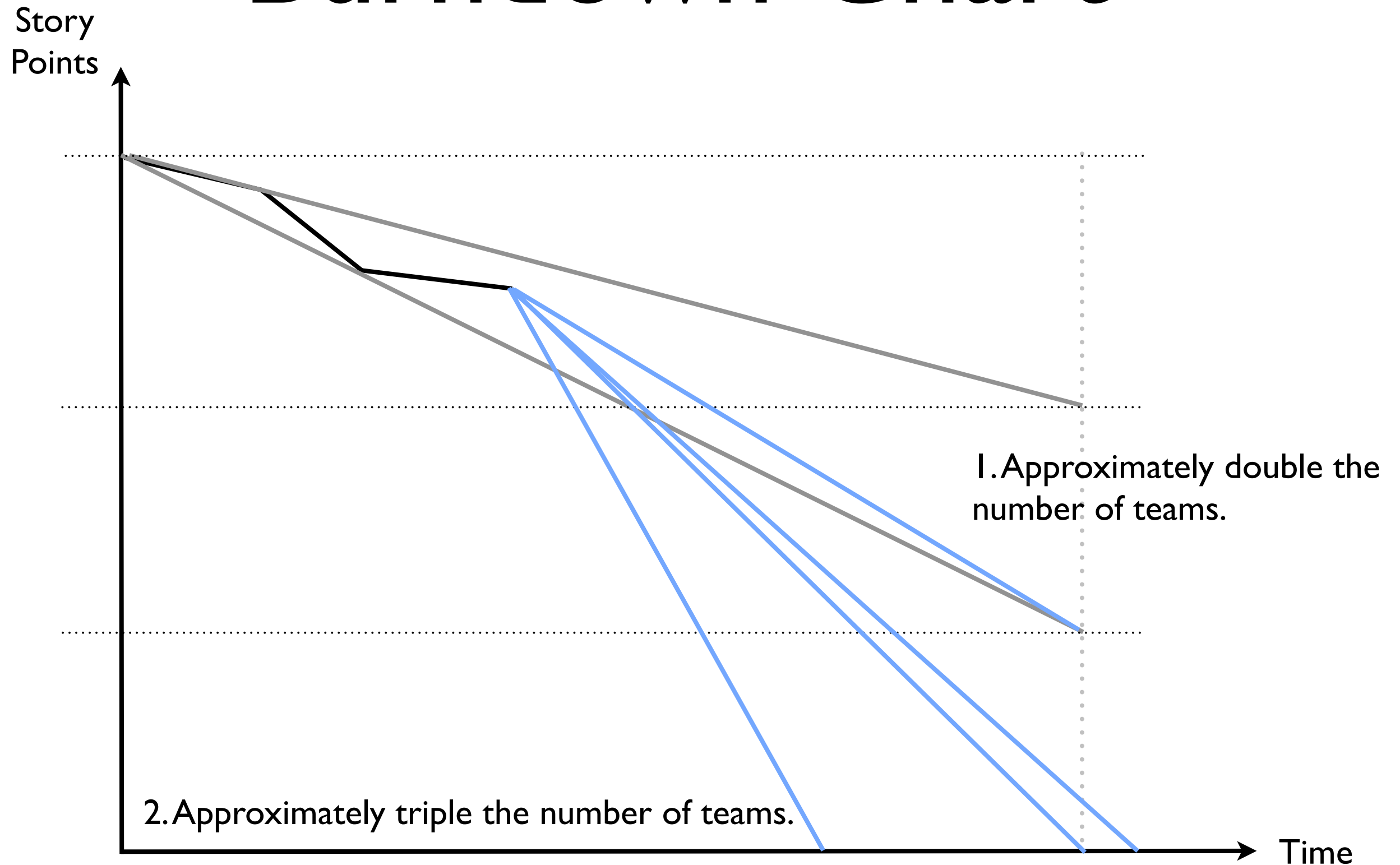
1. What is your first priority?
2. What is your second priority?



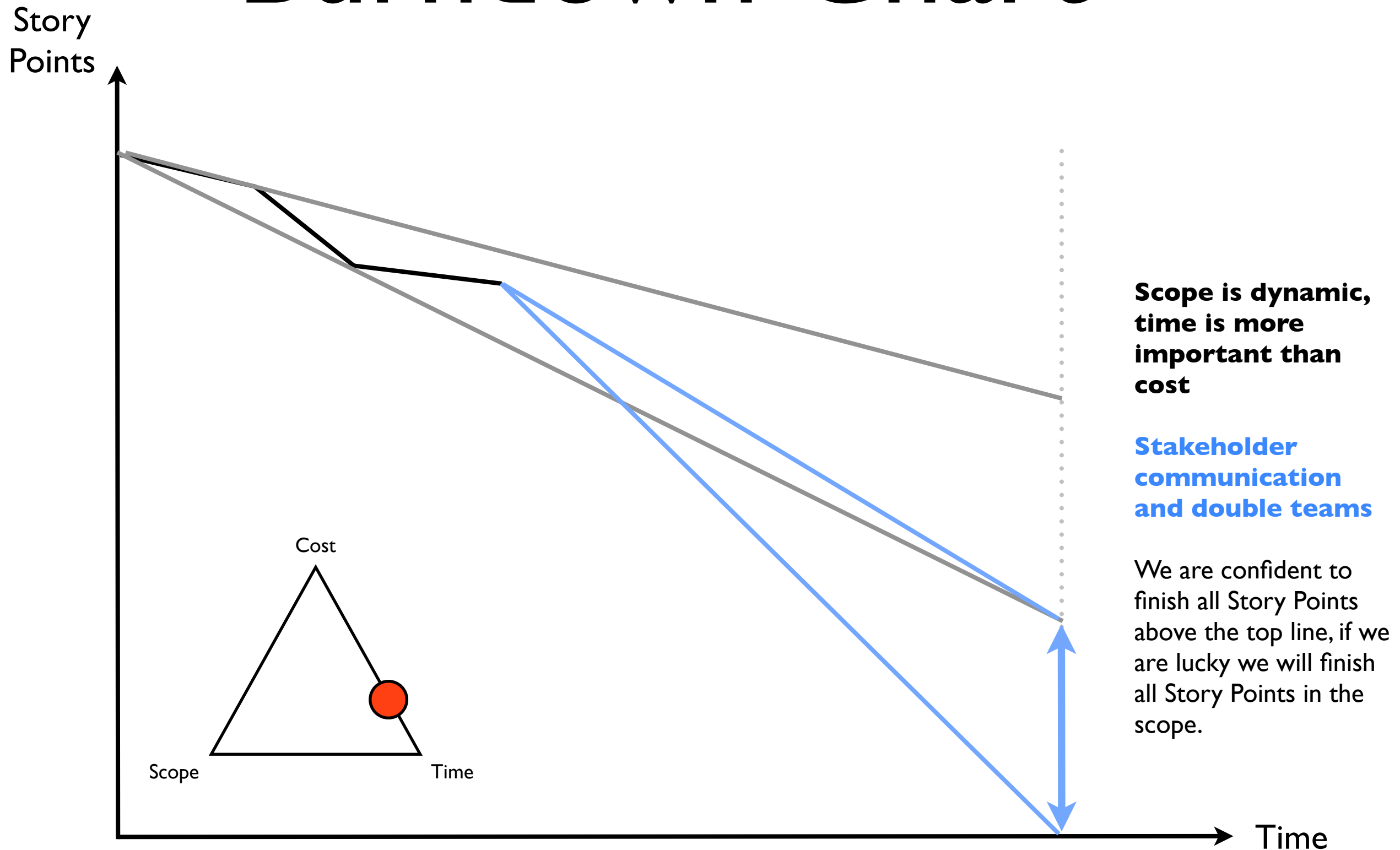
Burndown Chart



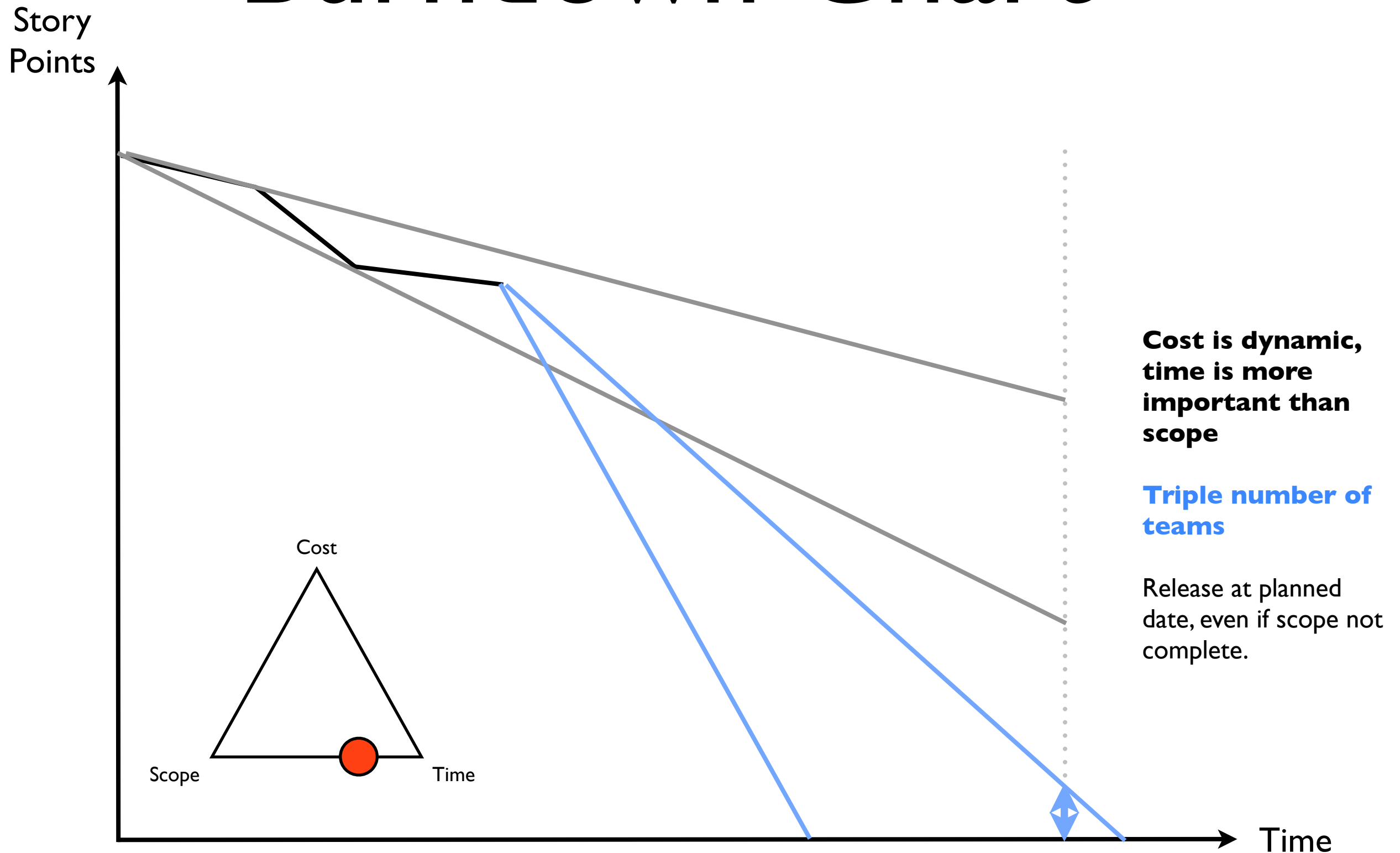
Burndown Chart



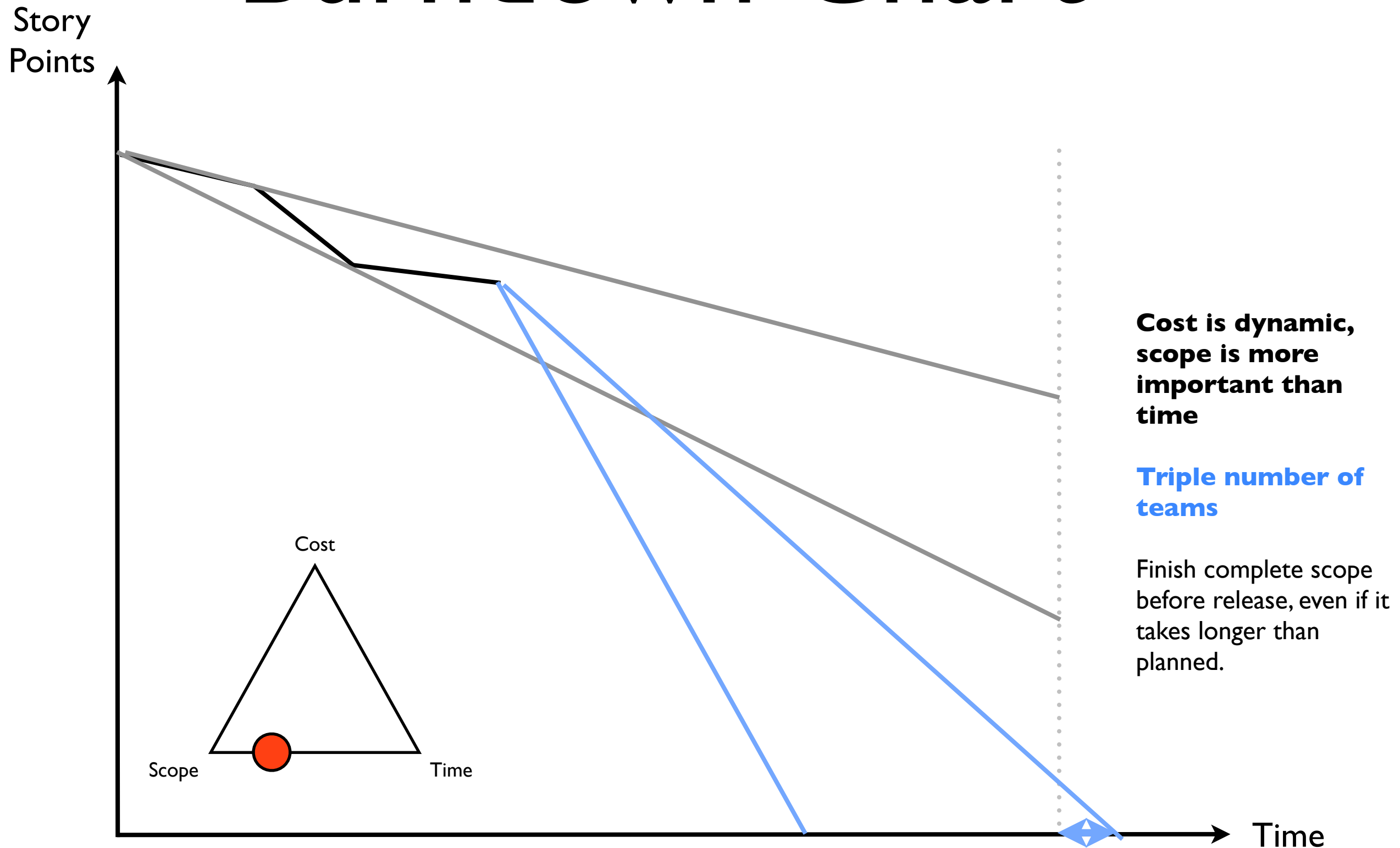
Burndown Chart



Burndown Chart



Burndown Chart



Burndown Chart

Story
Points



Scope

Cost

Time

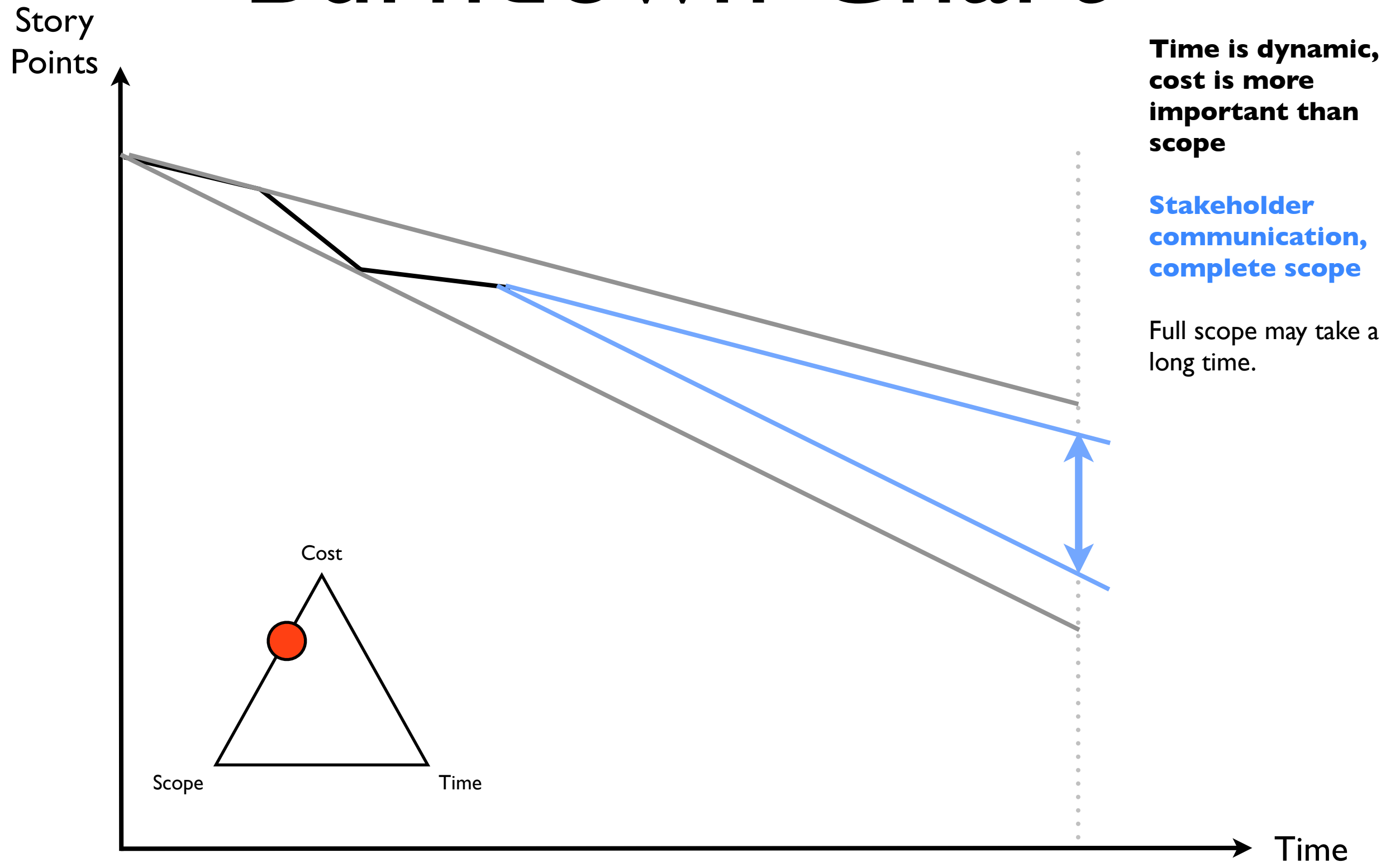
**Time is dynamic,
scope is more
important than
cost**

**Stakeholder
communication,
double teams**

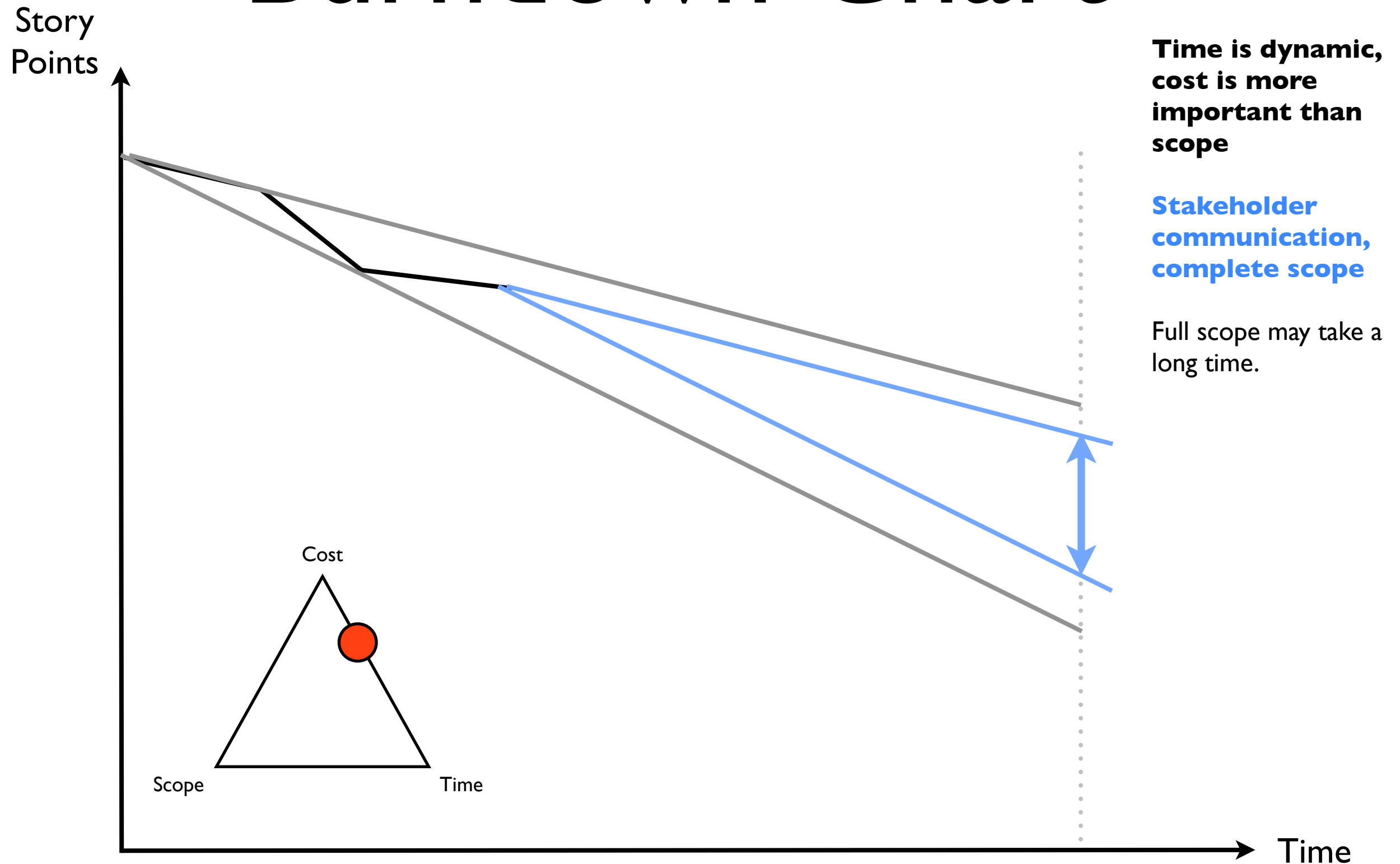
Full scope may take
long time.

Time

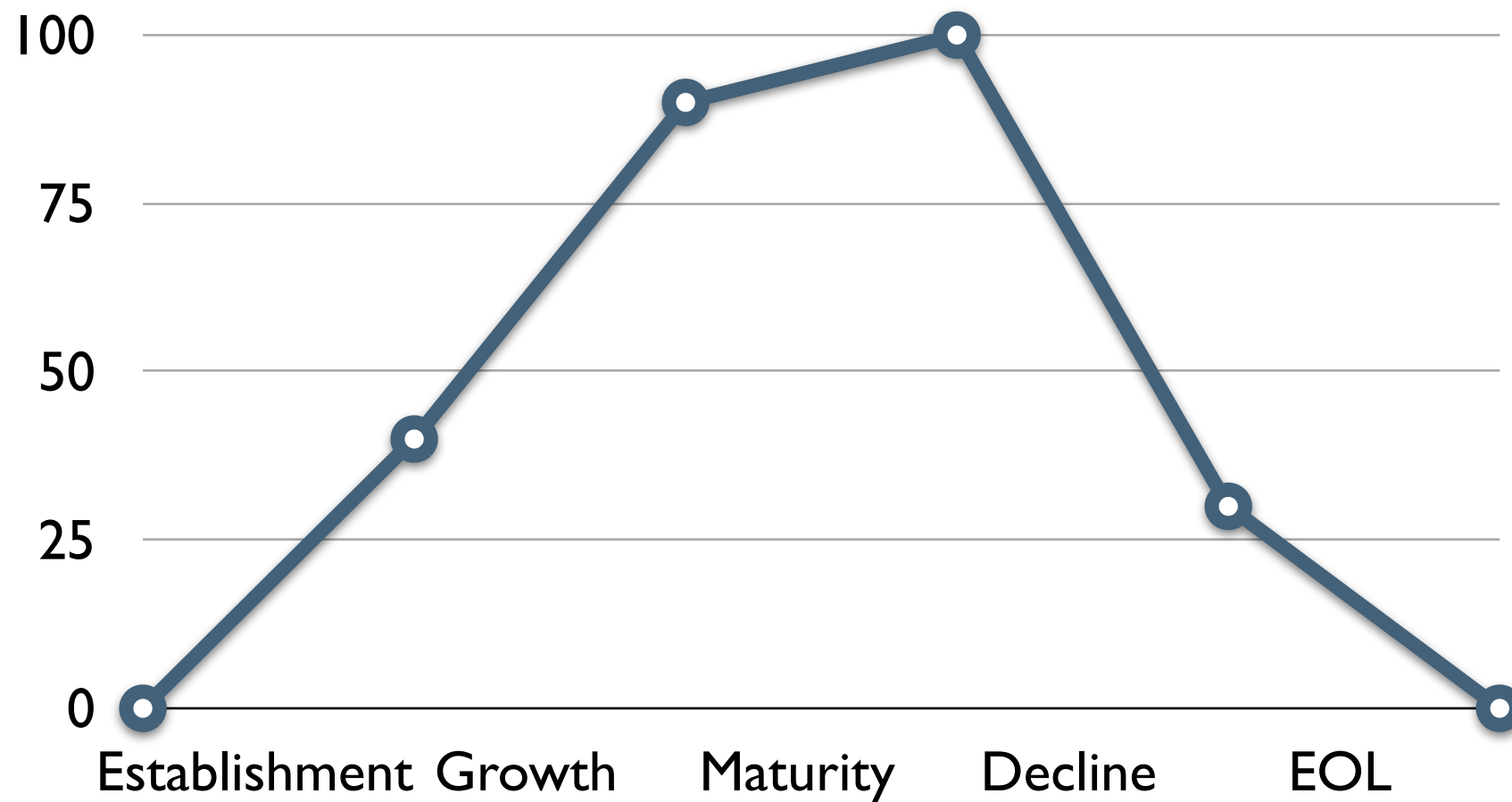
Burndown Chart



Burndown Chart



Project Types



Examples of project types

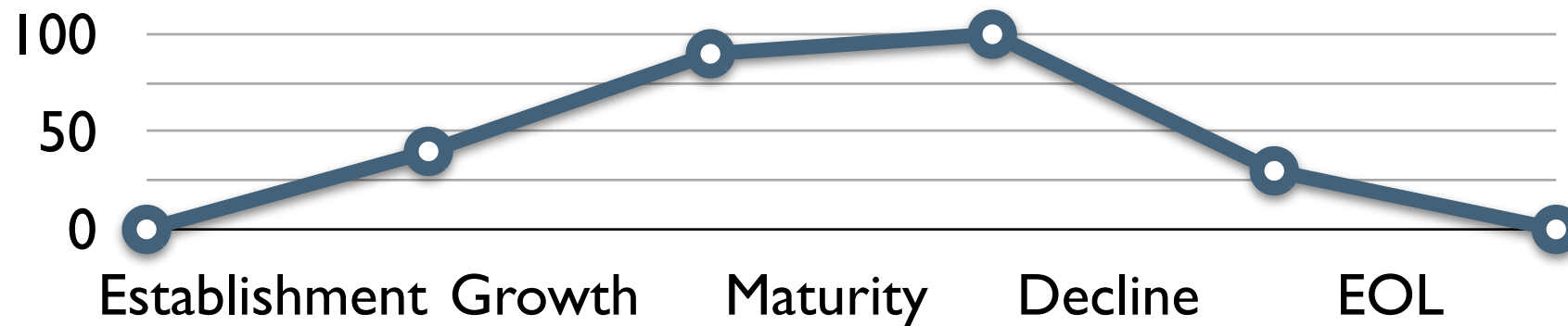
- Research project
- Development project
- Maintenance project

Agile tries to avoid projects by focusing on products instead.

Product focus

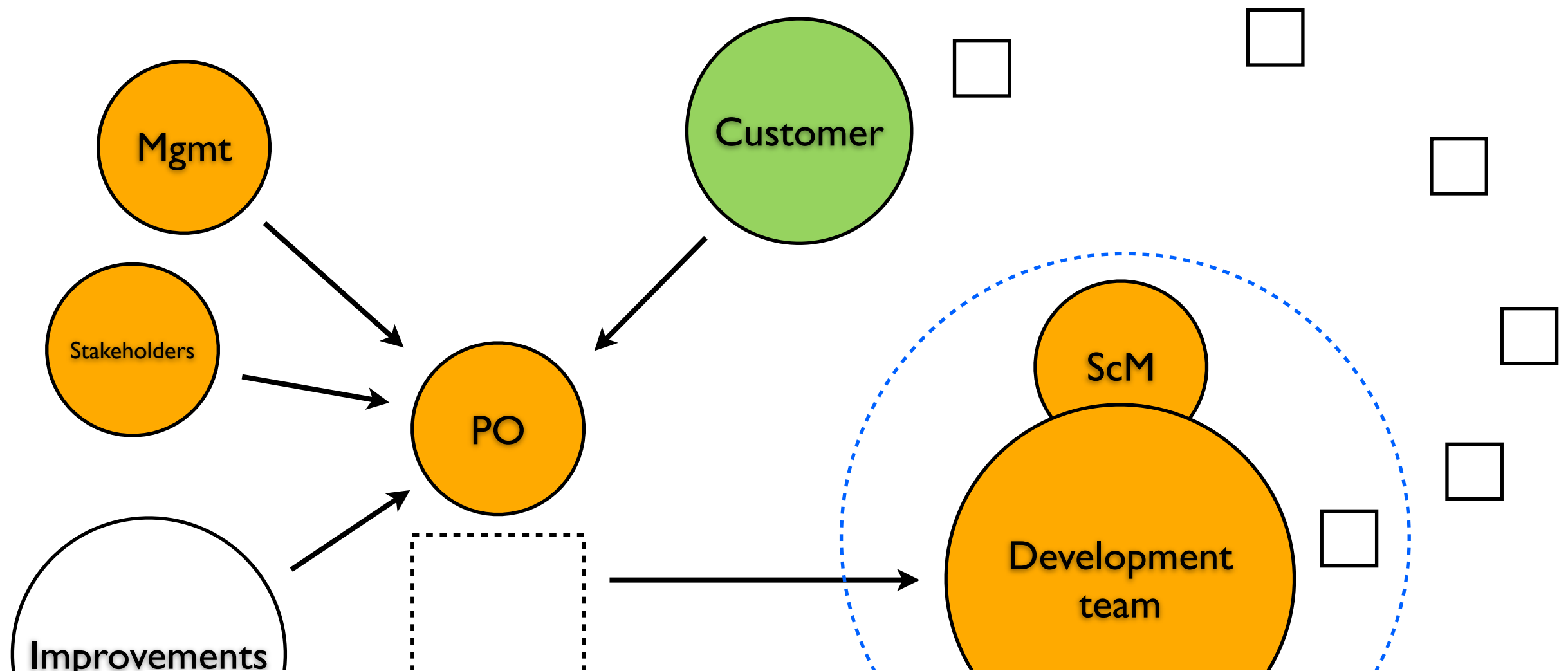
- Avoids different types a projects by prioritizing all tasks (new features, bug fixes, customer issues, etc.) together
- Benefits (less overhead, simple organization, one prioritization)
- Risks (customer issues have higher priority than ongoing development)

Team responsibility (or is there a need to go beyond “just teams”?)



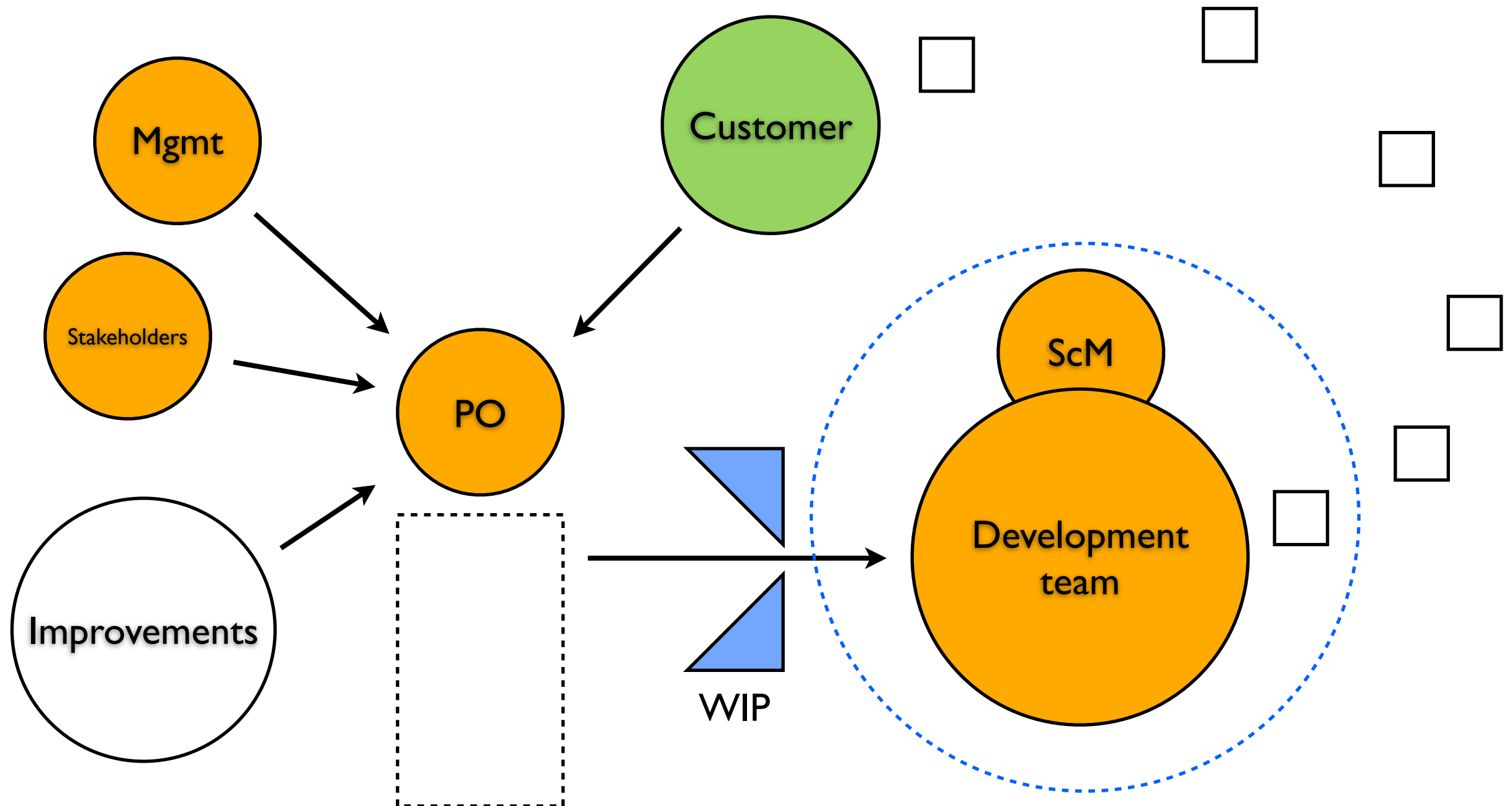
- Product research
 - Product development
 - Product verification
 - Release environment
 - Development environment
 - Customer installation (if needed)
-
- Customer support

Scrum Team Environment



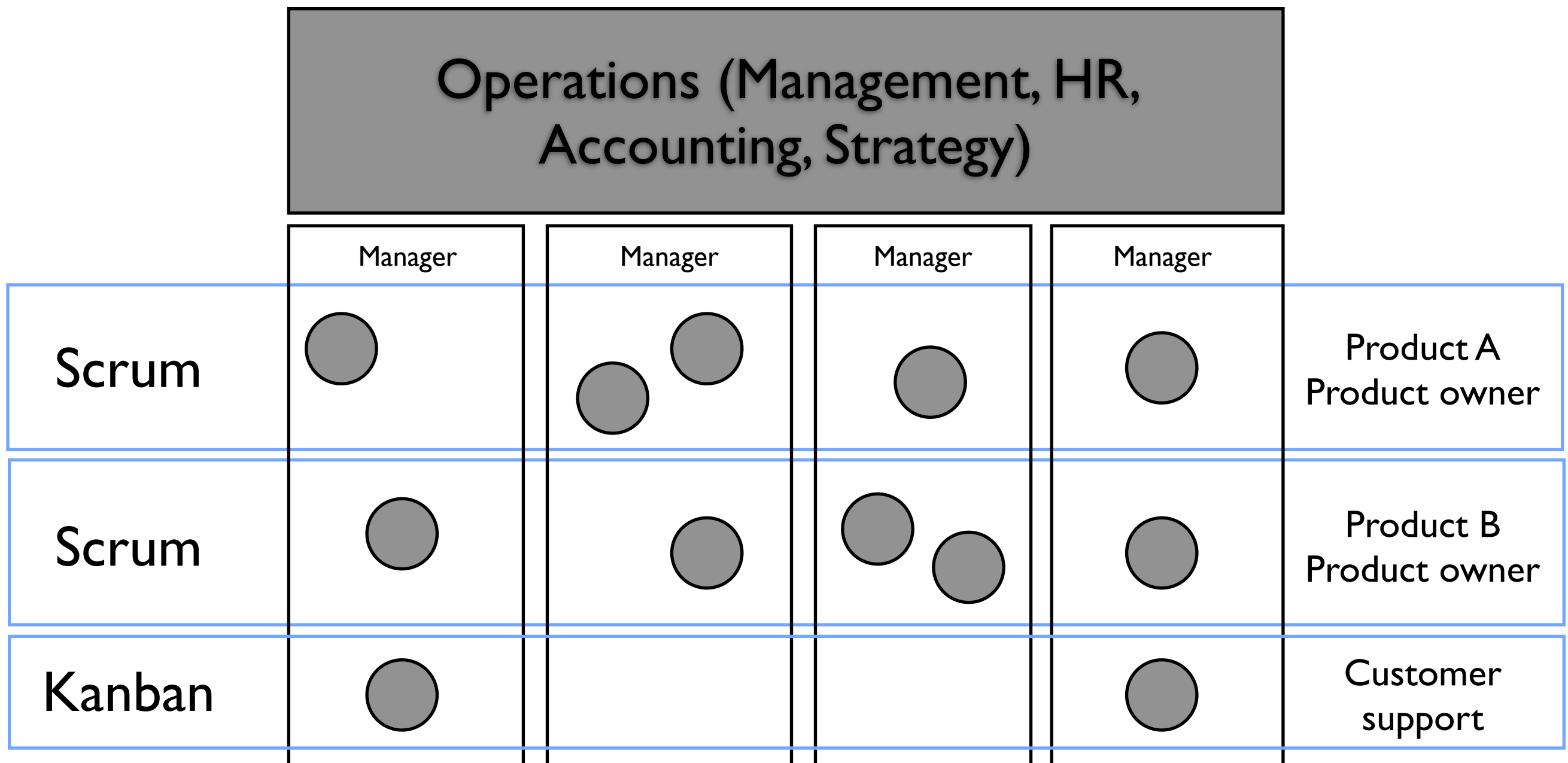
Sprints adds a lead time of average 0.5 Sprints.
I.e. not suitable for customer support.

Scrum Kanban Team Environment



Agile Organization

Basic Software Co.



One last thing...

- All methods, strategies, risk management, processes aside
- Project Management is first and foremost about leading people

Q&A