

Informatik-Projektentwicklung

Prof. Dr. Peter Müller
Software Component Technology

Wintersemester 04/05



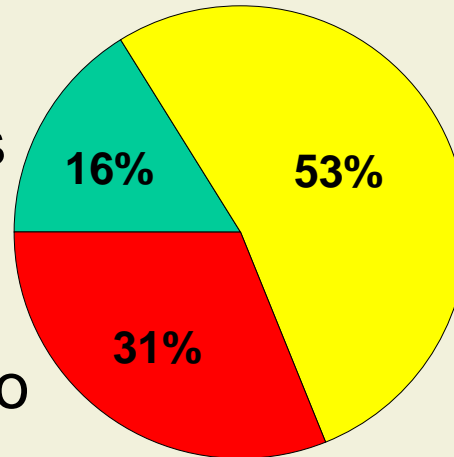
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

A Sad Story

■ Standish Group Research Study “CHAOS” 1995

Fully successful (on-time, on-budget, with all features as initially specified)



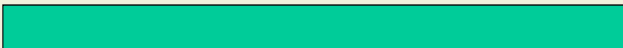
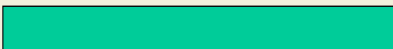



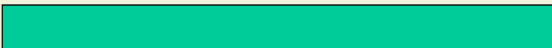

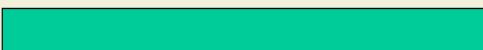
cancelled prior to completion



late, over-budget, or offered fewer features than originally specified

- The average unsuccessful project (yellow and red)
 - Lasts 222% longer than it was planned to last
 - Goes over budget by 189% (4% by more than 400%)
 - Offers 61% of originally specified features (yellow)

Why IT-Projects Fail

- Top 5 reasons measured by frequency of responses by IT executive management
- Failure profiles of yellow projects
 1. Lack of User Input  12,80%
 2. Incomplete Requirements  12,30%
 3. Changing Requirements  11,80%
 4. Lack of Executive Support  7,50%
 5. Technology Incompetence  7%
- Failure profiles of red projects
 1. Incomplete Requirements  13,10%
 2. Lack of User Involvement  12,40%
 3. Lack of Resources  10,60%
 4. Unrealistic Expectations  9,90%
 5. Lack of Executive Support  9%

How to Avoid Troubled Projects

- Apply proper engineering
 - ⇒ Characteristics of IT-projects
 - ⇒ Phases of IT-projects with their purpose, methods, and deliverables
- Apply proper project management
 - ⇒ Main processes of project management with their inputs, techniques, tools, and outputs
 - ⇒ Main areas of project management (scope, time, cost, quality, risk, etc.)
- Recognize the importance of non-technical aspects
 - ⇒ Some basic rules of successful project management

PMI – Project Management Institute

- Non-profit project management professional association
- Develops and maintains a professional certification program to advance the PM profession
- *A Guide to the Project Management Body of Knowledge* (PMBOK® Guide) is a globally recognized standard for managing projects
- The general PM part of this course is based on PMI standards, terminology, and systematics
- www.pmi.org



Agenda for Today

1. Introduction

1.1 Basics

1.2 Course Structure

1.3 Integration Management

1. Introduction

1.1 Basics

1.2 Course Structure

1.3 Integration Management

What is a Project?

Every project has a definite beginning and a definite end

- Definition:

A project is a temporary endeavor undertaken to create a unique product or service

The product or service is different in some distinguishing way from all similar products and services

- In contrast: *Operations* are ongoing and repetitive

Examples for Projects and Operations

■ Projects

- Developing a new software application
- Implementing a new business procedure
- Adding functionality to an IT system
- Doing a Diplomarbeit

■ Operations

- Bugfixing of an existing software application
- Selling train tickets
- Running a car factory

What is an IT-Project?

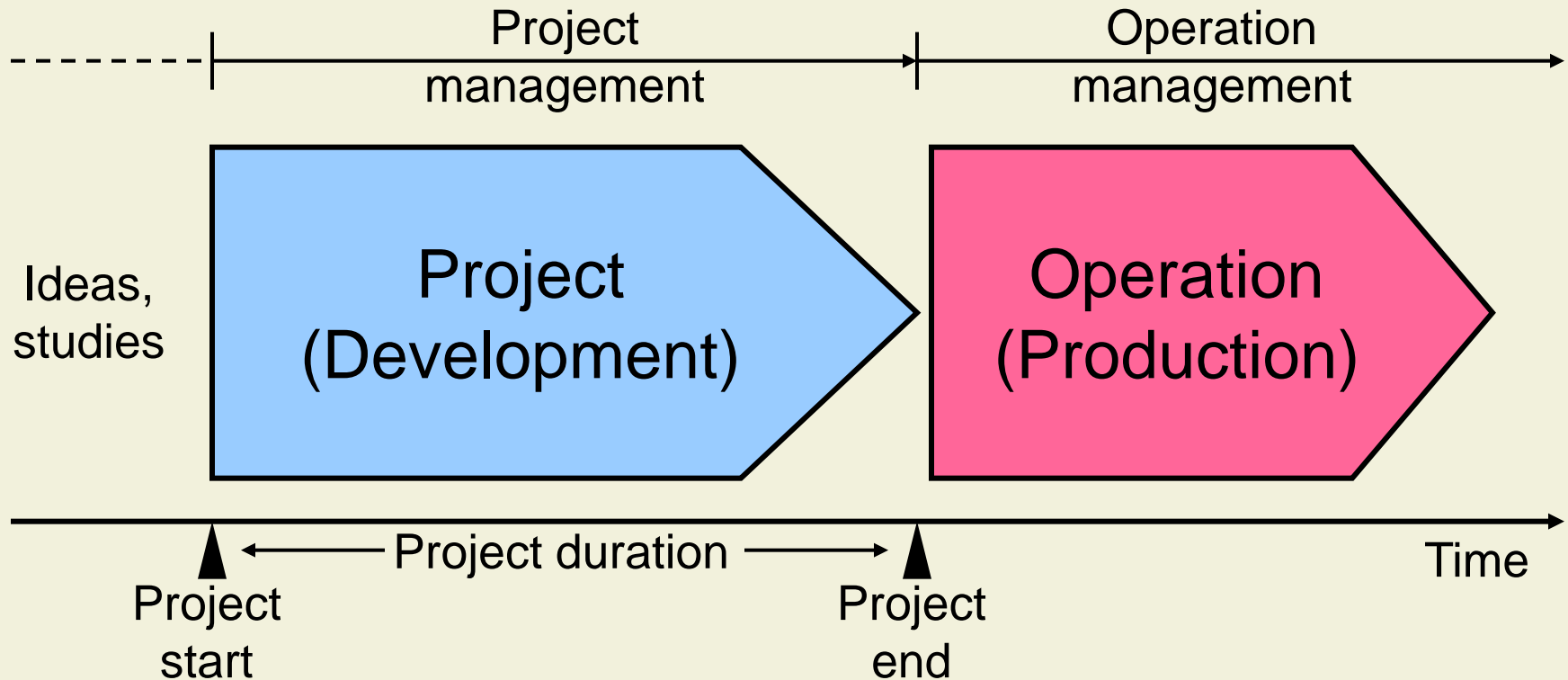
- Definition:

An IT-project is a project to create a product or service, of which the usage of information technology is the decisive characteristic

- Examples

- The development of a software application is an IT-project (IT-based product)
- The development of a car is not an IT-project, although information technology is involved substantially

From Projects to Operations

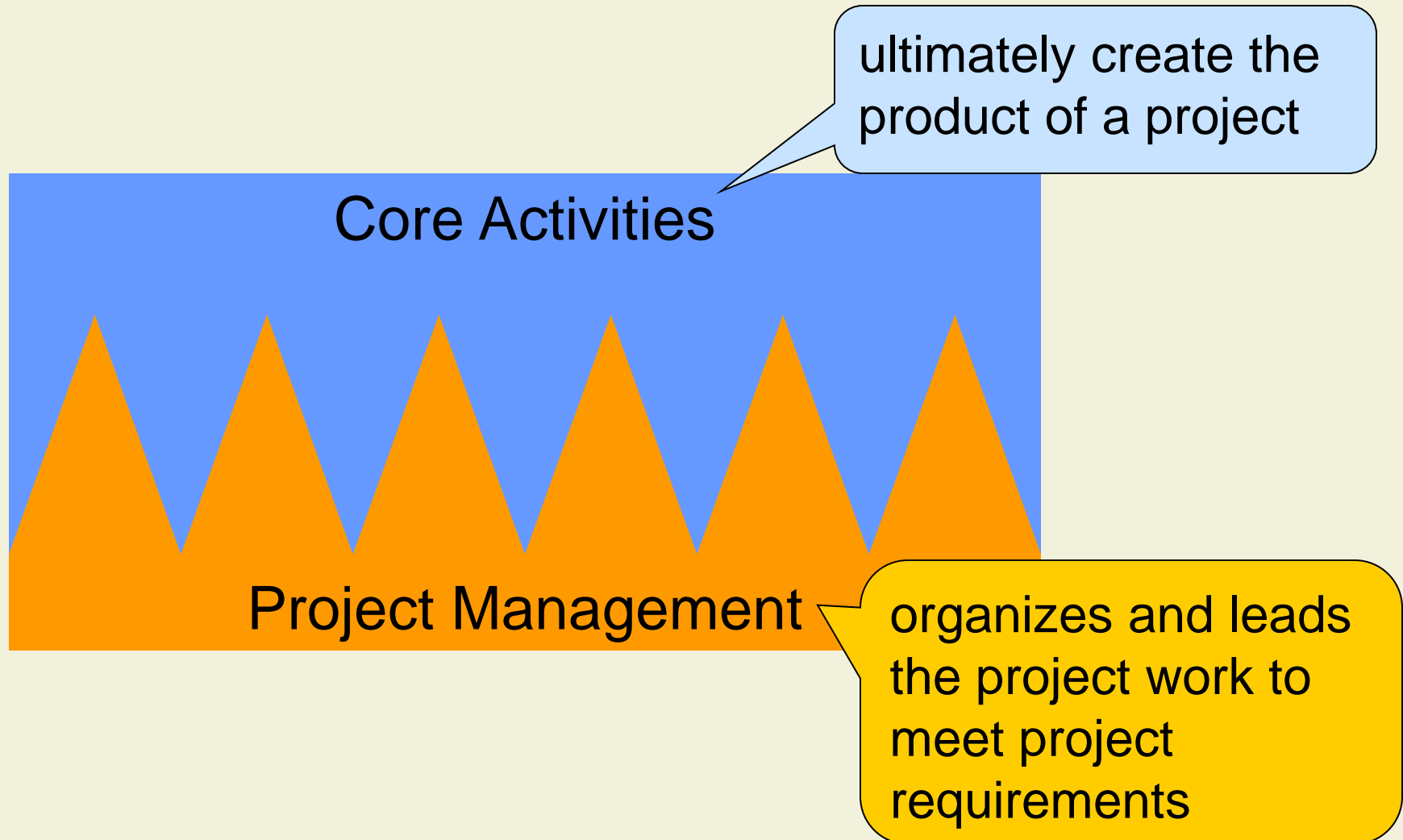


- Applications are neither projects nor operations, but products

Characteristics of Projects

- **Temporary** endeavor
- **Unique** product or service
- Performed by **people**
- **Constrained** by limited resources
 - Budget, time, staff
- **Planned, executed, and controlled**
- Have their own **organization**

Core Activities and Project Management



Project Management

- Definition of Project Management (PM):
Project Management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements.

Typical Core Activities in IT-Projects

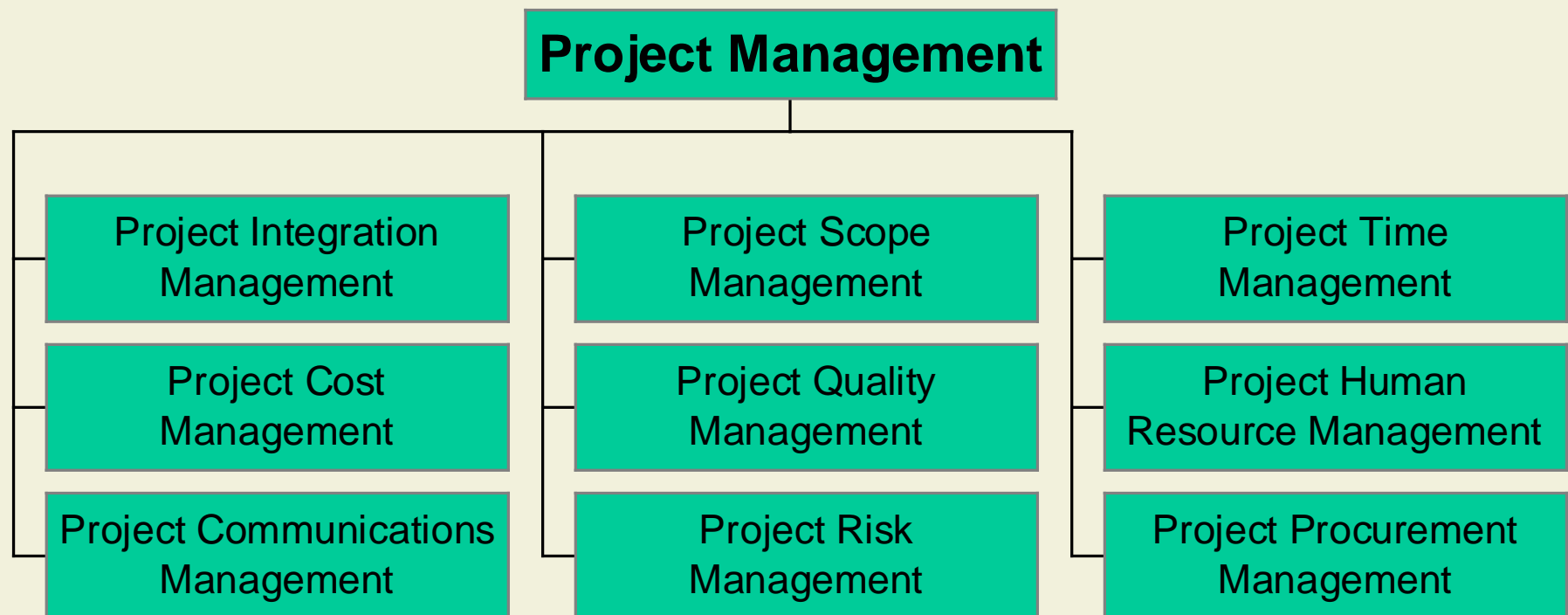
- Design of a graphical user interface
- Installation of a local area network
- Integration test of all system components
- Training of users on a new application
- Implementation of a set of Java classes
- Documentation of design decisions and code

Typical Project Management Activities

- Communication with team, clients, management
- Effort estimations
- Planning activities and assigning resources
- Comparing actual performance to plan
- Risk analysis
- Negotiation with subcontractors
- Staff acquisition

PM Knowledge Areas

PM activities fall into nine Knowledge Areas



1. Introduction

1.1 Basics

1.2 Course Structure

1.3 Integration Management

Course Outline (tentative)

2. Legal Issues (guest lecture by Prof. C. A. Zehnder)
3. Project Life Cycle and Project Management Life Cycle
4. Project Initiation and Planning
5. Scheduling
6. Cost Management
7. Project Management Tools (*)
8. Change and Risk Management
9. Quality Management (*)
10. Communication and HR Management
11. Team Building
12. Procurement Management (*)
13. Project Closeout, Exam

Case Studies

- You have to work on three case studies
 - Scheduling
 - Cost Management
 - Risk Management
- Deliverable for each case study
 - Detailed answers / solutions for the given tasks (written document)
 - Management summary of the results of the case study (5 slides)
- Case studies can be done in teams of two
 - Organize yourself

Case Studies: Presentations

- For each case study, we will select three teams to present their management summary in class
- Teams will be informed one (!) work day in advance (Thursday evening)

Timeframe (tentative)

22.11.	Distribution	Case study “scheduling”
01.12.	Deadline	
06.12.	Presentation	

06.12.	Distribution	Case study “cost management”
15.12.	Deadline	
20.12.	Presentation	

20.12.	Distribution	Case study “risk management”
19.01.	Deadline	
24.01.	Presentation	

Requirements

- To complete the course successfully, you
 - Have to participate in the case studies
 - Must pass the written multiple choice exam

- Requirements for case studies
 - At least 30 out of 60 possible points (3 x 20)
 - Points are granted for solution, management summary, and (if applicable) presentation
 - Solutions that come in late will be rated with 0 points!

Grading

- 2 credit points for successful completion
- The course is not graded
- Grading is possible for students from other departments or universities
 - Send email to ipe@se.inf.ethz.ch by November, 22.

Course Infrastructure

- Web page:
sct.inf.ethz.ch/teaching/ws2004/ipe/index.html
- Slides will be available on the web page
Wednesday before the lecture at the latest
- Email:
ipe@se.inf.ethz.ch

Related Courses

- Project Management
 - Projektführung und -abwicklung in der Praxis (Weydert, WS)
 - Fallstudien aus der Praxis (Gutknecht, Brandis, SS)

- Software Engineering
 - Info IV (Meyer, SS)

Literature: IT-Projects

- Zehnder, Carl August: Informatik-Projektentwicklung, vdf Hochschulverlag, 2003
- Jenny, Bruno: Projektmanagement in der Wirtschaftsinformatik, vdf Hochschulverlag, 2000
- Steinweg, Carl: Projektkompass Softwareentwicklung, Vieweg, 2002
- Frühauf, Karol: Software-Projektmanagement und -Qualitätssicherung, vdf Hochschulverlag, 2002
- Gaulke, Markus: Risikomanagement in IT-Projekten, Oldenbourg Verlag 2002

Literature: General Project Management

- A Guide to the Project Management Body of Knowledge (PMBOK® Guide), Project Management Institute, 2000
- Mulcahy, Rita: PMP Exam Prep (4th Edition), RMC Publishing, 2002
- Fleming, Quentin, Koppelman, Joel: Earned Value Project Management, Project Management Institute, 2000
- PMI – Project Management Institute, www.pmi.org

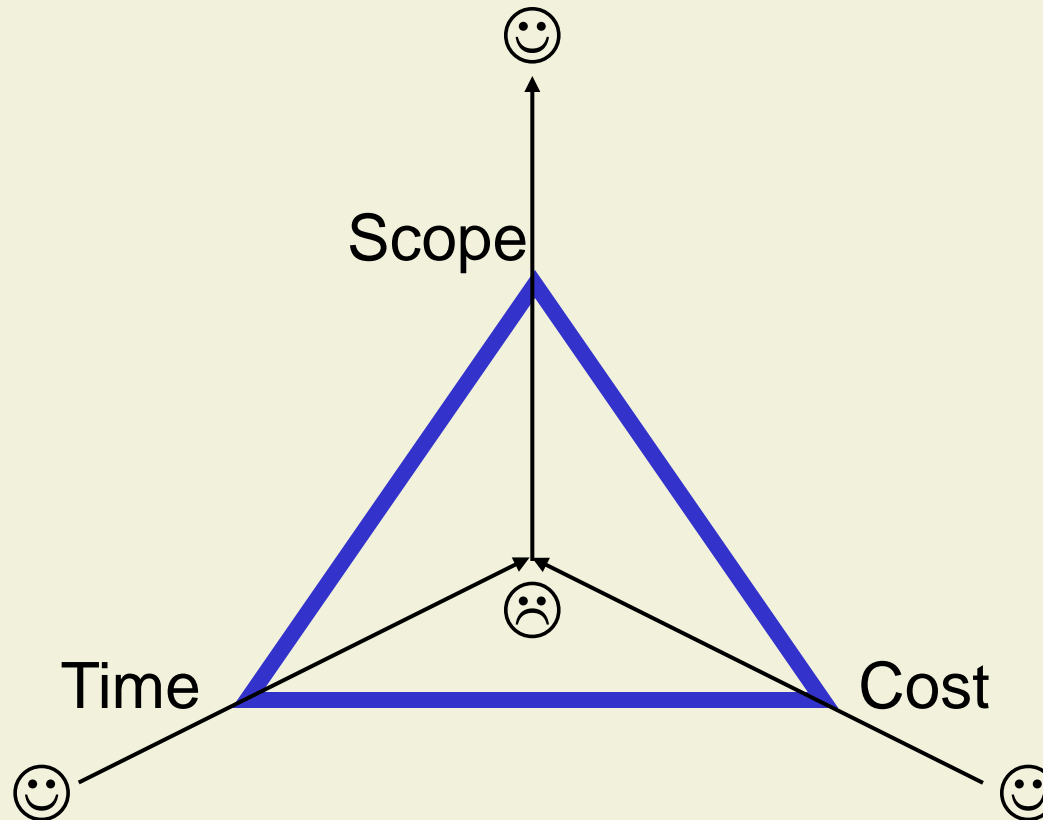
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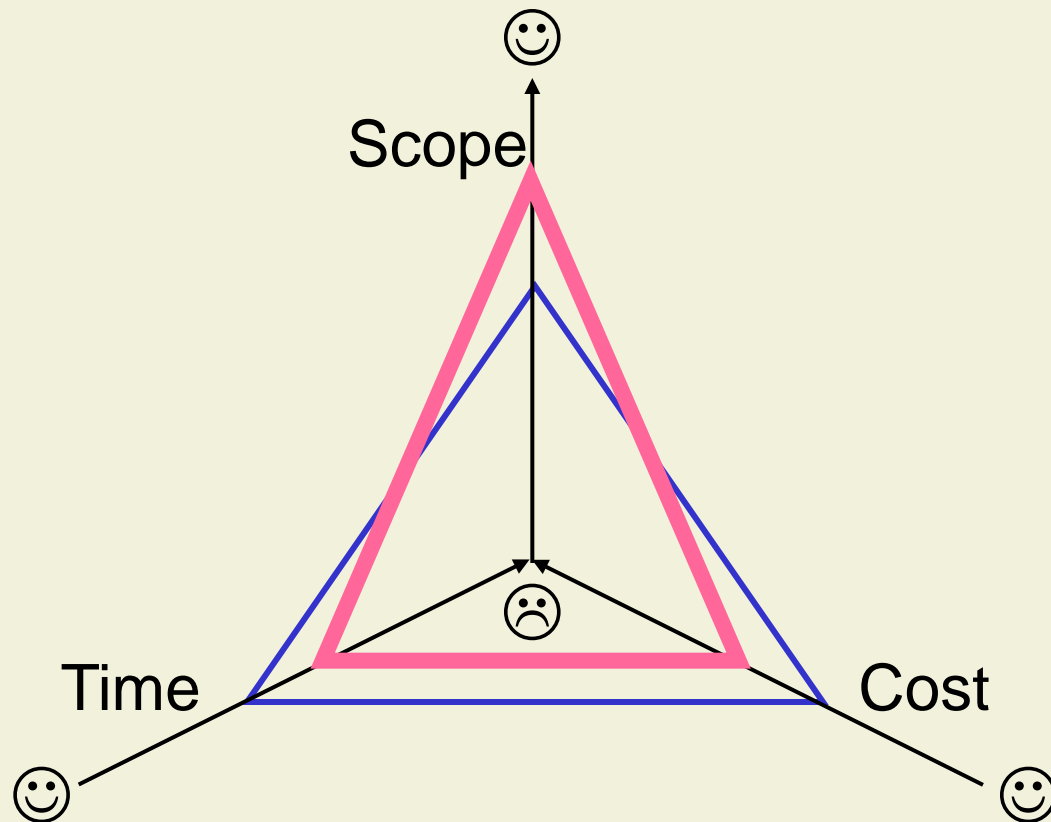
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The Triple Constraint



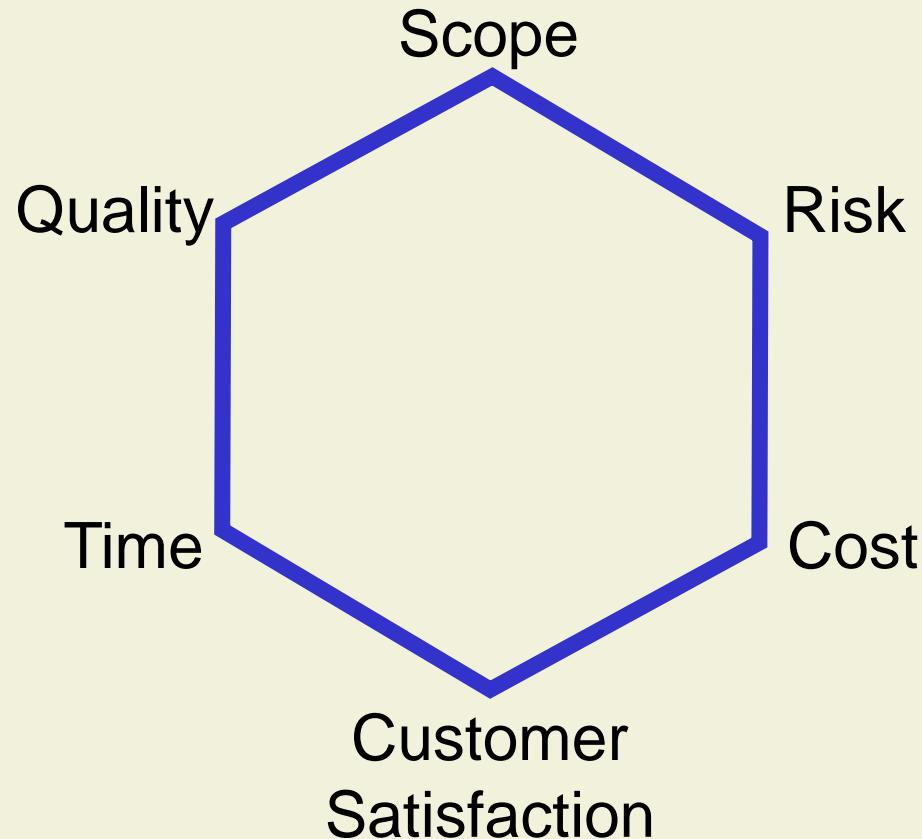
- Project objectives are **equally important**
- Actions in one project area usually affect other areas

The Triple Constraint



- **Tradeoffs** among objectives must be **managed**
- **Priorities** are set by customers and management

More Competing Objectives



Project Success

- Definition:

A project is successful if the specified results are delivered in the required quality and within the predetermined time and resource limits.

- Computer scientists tend to focus on scope and quality only
 - The development of a technically perfect application is not a success if the cost exceeds the price clients are willing to pay
 - Excellent project results often are worthless if they come too late (temporary market windows, external deadlines)

Project Integration Management

- Ensure that various elements of the project are **properly coordinated**
 - Estimate cost of staffing alternatives
 - Determine effects of a scope change on schedule
- Make **tradeoffs** among competing objectives and alternatives
- Primarily task of project manager since he / she is responsible for seeing the overall “**big picture**”

Integration Management Processes

- Project plan development
 - Integrates various planning outputs (time, cost, risk, etc.)
 - Produces a formal, consistent document to manage project execution
- Project plan execution
 - Produces actual work results
- Integrated change control
 - Determines that a change has occurred
 - Manages the changes as they occur
 - Results in corrective actions and project plan updates