Info IV
IT Project Management

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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

- 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
Agenda

Basics
Integration Management
Project Lifecycle
Project Management Lifecycle
What is a Project?

- Definition:

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

- 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 Diplomarbein

- **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
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

Core Activities

Project Management

ultimately create the product of a project

organizes and leads the project work to meet project requirements
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

- Project Integration Management
- Project Cost Management
- Project Communications Management
- Project Scope Management
- Project Quality Management
- Project Risk Management
- Project Time Management
- Project Human Resource Management
- Project Procurement Management
Agenda

Basics
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Project Management Life Cycle
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

- Scope
- Quality
- Risk
- Time
- Cost
- Customer Satisfaction
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
Agenda

Basics
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Project Life Cycle
Project Management Life Cycle
Projects are Complex

- At project start, only broad information about characteristics of product are available
- Average size of IT projects is 500-2000 person days
- Different tasks have to be performed such as designing a GUI, testing a module, installing hardware, training users, or negotiating with customers

.arrow How can we handle this complexity?
Decomposition According to Product

Requirements → Subproject → Subproject → Subproject → Unique Product or Service
Subprojects

- Decomposition usually follows structure of product
- Subprojects are easier to manage
- Subprojects enable one to use specialized staff
- Remaining and new problems
  - Only broad information about product characteristics
  - Managing the interfaces between subprojects
  - Integrating the results of the subprojects
  - Increased need for communication
- Subprojects are still complex
Progressive Elaboration

Characteristics of a unique product or service must be progressively elaborated.

- During the project, characteristics are defined in more detail as the project team develops a better and more complete understanding of the product.
Project Phases

Projects are divided into project phases

Precisely documented interfaces between phases: deliverables

Requirements → Project → Unique Product or Service
Deliverables

- **Definition:**
  
  *Any measurable, tangible, verifiable outcome, result, or item that must be produced to complete a project or part of a project*

- **Examples**
  
  - An object-oriented design, described by a UML diagram
  - A project schedule as MS Project file
  - A user guide for a new application
  - Software, delivered as compiled binary
Project Phases

- Definition:
  
  *A collection of logically related project activities, usually culminating in the completion of a major deliverable*
Project Phases

- Definition:

  A collection of logically related project activities, usually culminating in the completion of a major deliverable
Waterfall Model of Project Life Cycle

- Analysis Phase
- Design Phase
- Implementation Phase
- Test Phase
- Deployment Phase

Time
Properties of the Project Life Cycle

- Stakeholders’ influence on product characteristics and final cost is highest at project start and decreases progressively.
- Cost of changes and error correction increases during the project life cycle.
From Projects to Operations

- Project phases are surrounded by related activities that are not part of the project.
Product Life Cycle

Business Requirements

- Market Demand
- Business Need
- Customer Request
- Technological Advance
- Legal Requirement

Project

Operation

Product
Agenda

Basics
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Project Management Life Cycle
Core and Project Management Processes

- Core Processes
- Project Management Processes

Grouped into phases
Grouped into process groups
Project Management Life Cycle

Initiating Processes → Planning Processes

Planning Processes → Executing Processes

Executing Processes → Controlling Processes

Controlling Processes → Executing Processes

Executing Processes → Closing Processes

Closing Processes → Planning Processes

Initiating Processes
Example: Time Management

- Schedule Development
  - Schedule Updates
  - Task List for Each Team Member
- Schedule Control
  - Status Reports
- Project Plan Execution
  - Corrective Actions
Process Groups

- Project groups are not discrete one-time events
- They overlap and occur at varying levels of intensity within each phase of the project
Interaction between Phases

- Input and output of the processes depend on the phase in which they are carried out
- But processes are not limited to one phase (overlaps)
Core and Project Management Processes
Core and Project Management Processes

Core Processes

Project Management Processes
BACKUP