



Project Basics

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Who Am I?

- Computer Science program
- ISD Datasystem AB (6 years)
 - Developer
 - Technical Project Manager 1 ½ year
- Ericsson AB (1 year)
- PhD Student since 2002



Project

- Clear goals
- Start time and end time
- Specific resources
- Different competences
- Specific task (done once)



Why Project?

- What is a project?
- Why project?
- Difficulties
- Teaching
- Idea to result (study-project-use)
- Line versus project work



Poloya's Method

- Understand the problem
 - Definition phase – WHAT?
- Create plan
 - Planning phase – HOW?
- Execute plan
 - Execution phase – DO!
- Evaluate Result
 - Evaluation Phase – Test!



Alternative (names)

- Feasibility study
- Establishment
- Execution
- Ending

Feasibility study

- Inform and consolidate
- Basic data for decision making
- Reduce risk of investment

Risk Analysis

- Probability, Consequences, Class
- Be proactive!
- Examples
 - Hidden (uncovered requirements)
 - Efficiency of Implementation
 - HW problems
 - Delivery problems contractors
 - Absents of people

Undertaking

- Solve the customer's problem

Project Environment

- Steering Board
- Change and Control Board
- Reference Group
- Internal Requirement
- Standards
- Laws and Regulations

Project group

- Formal Group – has leader
- Roles
- Conflicts
- Communication lines
- Forms of cooperation

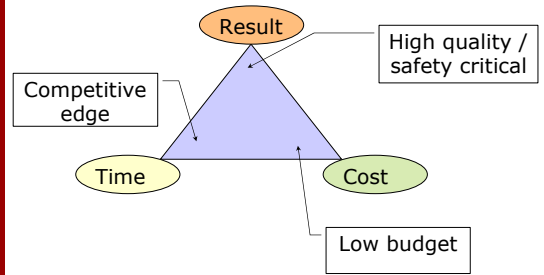
Objective description

- Project objective
 - In the end
- Part objective
 - Parallel
- Stage objective
 - In time

Effect objectives

- Learning
- Money
- Pilot project
- --- Externalities ---

The three dimensions of objectives



Requirement Spec

- Who makes the RS?
 - Client
 - Supplier
 - In dialog

Req Spec 2

- Not a design document
- Includes all requirements
- Testable
- No contradictive reqs

Req./Objectives are:

- Measurable
- A state
- Realistic
- Challenging
- Clear

Addition to RS

- User interface reqs.
- Deployment reqs

IEEE Standard Req. Doc

1. Introduction
2. General description
3. Specific requirements
4. Appendices
5. Index

IEEE Introduction

- Purpose of the requirement document
- Scope of the product
- Definitions, acronyms and abbreviations
- References
- Overview of the remainder of the document

IEEE General Description

- Product perspective
- Product functions
- User characteristics
- General constraints
- Assumptions and dependencies

IEEE Specific Requirements

- Functional requirements
- Non-Functional requirements
- Interface requirements

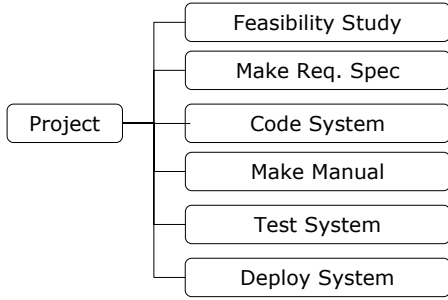
IEEE Appendix

- E.g. Hardware requirements
- Database description, relationship between data etc

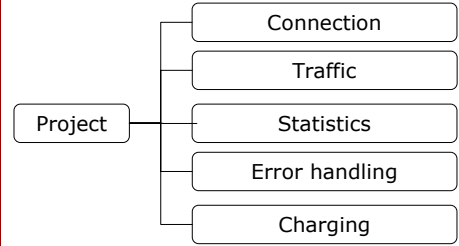
IEEE Index

- Alphabetic index
- Index of diagram
- Index of functions

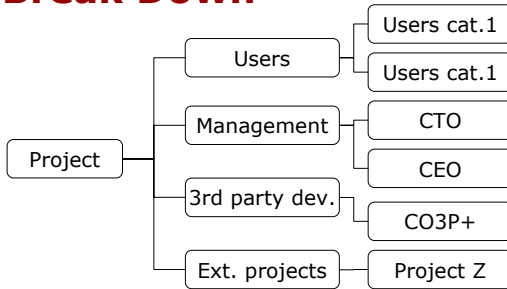
Activity Based Break Down



Functional Based Break Down



Interest Based Break Down



Organization



Organization

- Project Manager
 - External relations
- Technical Team Manager
- Configuration Manager

- Tool smith (Environment)
- Phase responsibilities
 - Requirement Manager
 - Description
 - Implementation
 - Test Manager

Project Management

- Steering
- Planning
- Administration
- Communication
- Technical coordination
- Economical supervision
- Quality assurance

Time Planning

Time plan

- Phases
 - Gantt diagram, calendar time
 - Development model??
- Milestones
 - Must not be waterfall
 - Has goals that can be verified
- Deliveries (external deadlines)
 - Also includes documents
 - Plan for reviews and corrections

Milestone

- Is significant (matters)
- Visible
- Measurable
- Synchronizes parallel activities

Resource Planning

Resource Plan

- Human resources
- All assets
- This is to spread the knowledge!!!
- If you write something down then someone else can tell you if they disagree.
- Assure that you get the resources!!

Cost Planning

Project Tools

Report Plan

- Meetings
 - External, project, group, quality
 - Types, working, informational, decisional
 - Mandate ?
- Written reports
- Archive

Follow-up

Project End

Write Formal Documents

(0) Introduction

- Document name
- Responsible editor
- Version number
- Date
- Abstract
- Identity
- Index

1, Document Description

- Document history
 - Version, date, writers, comment
- Document overview
- Distribution (Receivers of doc.)
- Abbreviations and wordlist
 - Could be last in the document

2, Project Description

- Background
 - Why this project has been launched, by who, context
- Objectives
 - List objectives of the project
 - Could be educational, not only a product

Document Plan

- Editor, Writers, reviewers, examination dates
- Project Plan
- Requirement Specification
- SAD (Software Architecture Description)
- Design specification (?)
- Construction Guidelines
- Test plan
- Test Specifications (Unit, Integration, System)
- Test Reports
- Manuals, usage descriptions

Configuration Management

Configuration Management

"The discipline of identifying the components of a continuously evolving system (taken into account relevant system interfaces) for the purpose of controlling changes to these components and maintaining integrity and traceability throughout the system lifecycle"

- **British Standard BS 8488:1984**

Principal CM Activities

- CM Planning
- Change Management
- Version and release management
- System Building

CM planning

- Define what to be managed and the scheme that you should use to identify these
- Set out who is responsible for the CM procedures and for submitting controlled entities to the CM team
- Define the CM policies that all team members must use for change control and version management
- Specify the tool and process to use for CM.
- Describe the structure of the configuration database

Version Management

- Of documents
 - Version numbering
 - How a document becomes public, valid
 - Reviews
 - Description of the documents lifecycle
- Of code:
 - Release handling etc.

Quality Management

Quality Plan

- Routines for document reviews
 - Formal, "less formal"
- Unplanned inspection from external reviewers (silent ?)
- Milestone review

Test Plan

- Continuous testing
- Continuous integration
- OR (V-model)
 - Unit test
 - Integration test
 - System test
 - Acceptance test
- Bug reporting (same as change request)

Education Plan

- Tools
- Process
- How to teach next years students what you code can do?

Requirement Management

Problem Analysis

1. Gain agreement on the problem definition
2. Understand the root causes- The problem behind the problem
3. Identify the stakeholders and the users
4. Define the solution system boundary
5. Identify the constraints to be imposed on the solution E.g Economic, Political, Technical, System, Environment, Schedule and resources

Needs/Features/Sw req

- Needs can be weak and ambiguous
- Feature is: a service the system provides to fulfill one or more stakeholder needs
- Attributes of features: Status, Priority/Benefit, Effort, Risk, Stability, Target Release, Assign to, Reason

Requirement leakage

- Enhancements mentioned by distributors who had been overheard by programmers at a sales convention
- Direct customer requests to programmers
- Mistakes that had been made and shipped and had to be supported

Req. Leakage cont.

- Hardware features that didn't get in or didn't work
- Knee jerk change-of-scope reactions to competitors
- Functionality inserted by programmers with "careful consideration" of what's good for the customer
- Programmers' Easter Eggs

A Process for Managing Change

1. Recognize that change is inevitable and plan for it
2. Baseline the requirement
3. Establish a single channel to control change
4. Use a change control system to capture changes
5. Manage change hierarchically

Sources of change

- Customer and end users
- Marketing
- Developers
- Testers
- Others

Change Plan

- At testing you can find pure bugs or deviations from spec.
- All anomalies shall be reported in a formal way! (e.g. Bugzilla)
 - Who found the bug
 - In what version
- It is not obvious that all bugs must be corrected.
- Change and Control Board
- Internal tests before check in

Modeling with UML Diagrams

Diagram types

- Class diagram
- Component diagram
- Use Case Diagram
- Interaction diagram
 - Sequence diagram
 - Collaboration diagram
- State diagram
- Activity diagram