Project Management

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Outline

- The 4 Ps in Project Management
- Detailed Insight of each P

4P's in Project Management Spectrum

- People
- Product
- Process
- Project



People

- The most important factor in success of software project
- "Companies That sensibly Manage their investment in people will prosper in the long run" Tim & Tom

PM-CMM People Management Capability Maturity Model

- Developed by Software Engineering Institute to enhance their Capability through personnel development.
- Key Practice Areas
 - Recruiting
 - Selection
 - Performance Management
 - Training
 - Compensation
 - Career development
 - Organization and work design
 - Team/culture development

People Involved in Software Process

- Stakeholders
- Team Leaders
- Software Team
- Agile Teams

The Players/Stakeholders

- They can be categorized into one of the following
 - Senior Managers
 - they define business issues that often have significant influence on business
 - Project (technical) managers
 - they must plan, motivate, organize and control the practitioners who do software work
 - Practitioners
 - They deliver the technical skills necessary to engineer a product or application
 - Customers
 - They specify the requirements for the software to be engineered
 - End Users
 - They interact with the software after it is released for production use

Team Leaders

- Competent Practitioners often make poor tem leaders as they lack the right mix of skills
- In his excellent book of technical leadership, Jerry Weinberg suggests a MOI model of leadership MOI Model of Leadership
 - Motivation
 - encourage technical people (by "push" or "pull") to produce
 - Organization
 - Apply , improve processes efficiently
 - Ideas or Innovation
 - Make people feel creative
 - Be Creative

Four Characteristics that define Software manager

- Problem Solving
 - Diagnostic
 - Skill to solve
 - Ability to design solution
- Managerial Identity
 - Control the project
- Achievement
 - Reward Initiative
 - Encourage Controlled risk taking
- Influence the team Building
 - Influence the team
 - Read people's mind and respond according to their needs
 - Be controlled in stress situations

Options for applying Human Resources

- N people assigned to m tasks, no combined work, Coordinated by SPMr
- N people assigned to M tasks, Make teams,
- N people organized in T teams, team has a defined structure

Software Team Organizations

- Democratic decentralized
 - No permanent leader
 - Communication is horizontal
- Controlled decentralized
 - Defined Leader
 - Horizontal communication
 - Problem solving is a group activity
- Controlled centralized
 - Defined team leader
 - Problem solving , communication and management by team leader
 - Communication is vertical

7 Factors affecting team Structure

- Difficulty of task
- Size of resultant code (no. of lines)
- Time to stay together
- Degree of modularization
- Required Quality and reliability
- Rigidity of schedule
- Degree of communication

Communication & coordination techniques

- Formal ,impersonal approaches
 - SE documentation, Tools, Customer requests
- Formal, interpersonal approaches
 - Status review meetings
 - Design and code inspections
- Informal, interpersonal approaches
- Electronic communication
 - E-mail, electronic bulletin boards, video conferencing
- Interpersonal networking
 - Team members and people outside the project that can assist in project

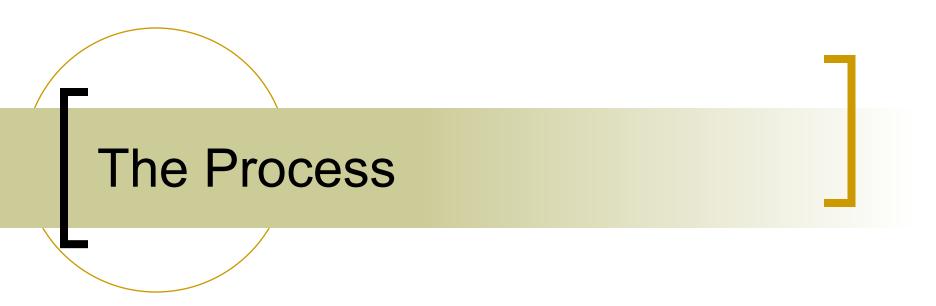


Software scope (stage1)

- **Context** (1st step in scope determination)
 - Functional location of the software product into a large system, product or business context
 - Constraints involved
- Information Objectives (2nd step)
 - What data objects are required as i/p or o/p
- Function and Performance (3rd step)
 - What function does the software system perform on i/p to produce o/p
 - What level of performance is required

Problem Decomposition (stage 2)

- Also called partitioning OR problem elaboration
- This activity is at core of requirements analysis
- Divide and conquer policy for complex problems
 - Decompose problem in tasks
 - Decomposition in 2 major areas
 - Functionality to be delivered
 - Process to be used



*Common Process Framework Activities

- These characterize a software process and are applicable to all software projects
 - Communication
 - Planning
 - Modeling
 - Construction
 - Deployment
- These are applied to software engineering work tasks (e.g., different product functions)
 - Refer to book page 640 fig. 21.1

The Process Models

- Different process models:
 - Linear sequential, Prototyping, RAD, Spiral, Formal ...
- Project manager must decide about which model to use depending on
 - Customers who have requested the product
 - People who would work on project
 - Product characteristics
 - Project environment
- Project planning begins once model is selected

Process decomposition

- The way a process is decomposed depends on project complexity
- Decomposition involves outlining of work tasks involved in each process framework activity



Signs of Projects Risk

- Software people don't understand customer needs
- Product scope is poorly defined
- Changes are managed poorly
- The chosen technology changes
- Business needs change
- Deadlines are unrealistic

Signs of Projects Risk (Cont...)

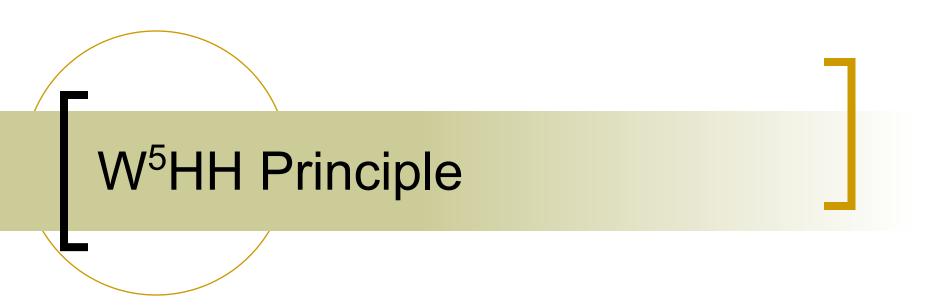
- Users are resistant
- Sponsorship is lost
- Team lacks skills
- Managers avoid best practices

How to avoid problems?

- Start on the right foot
 - Involves detailed understanding of project
 - setting realistic objectives & expectations
 - Selecting the right team
 - Facilitating the team
- Maintain Momentum
 - Provide incentives
 - Reduce bureaucracy and give autonomy to team members but with supervision
- Track Progress
 - Assess progress as work products are produced

How to avoid problems? (Contd..)

- Make smart decisions
 - When possible, use existing software components / COTS software
 - Choose standard approaches and keep it simple
 - Avoid risks and allocate more time than needed for complex/risky tasks
- Conduct a postmortem analysis
 - Compare planned and actual schedule
 - Collect and analyze project metrics (standards)
 - Get feedback from team and customers
 - Establish record of lessons learnt for each project



About the principle

- Suggested by Barry Boehm in his paper
- Excellent planning outline for project managers and software team
- Applicable to all sizes of software projects
- It is an approach to address
 - project objectives
 - Milestones & schedule
 - Responsibilities
 - Management & technical approaches
 - Required resources

W⁵HH principle

- Why is the system being develop?
- What will be done and when?
- Who is responsible for a function ?
- Where are the team members? organizationally located?
- How will be job done technically and managerially?
- How much of each resources needed?

Step Of Project Mgmt Life Cycle

- Negotiate Scope,
- Identify Tasks,
- Estimate task Duration,
- Specify inter-task Dependences, Activity
- Assign Resources,
- Direct the Team Effort, Activity
- Monitor and Control Progress,
- Assess Project Result and Experiences.