

Project Analysis and Definition

Project Management

- The key to successful project management is to focus on the **4P**
 - ◆ **People** — The most important element of a successful project
 - ◆ **Product** — The software to be built
 - ◆ **Process** — The set of framework activities and software engineering tasks to get the job done
 - ◆ **Project** — All work required to make the product a reality

Project Management

- It is synergy of all four Ps working together that yields the successful management of software products.
- Process framework activities are populated with tasks, milestones, work products, and quality assurance checkpoints regardless of the project size.
- To avoid project failure developers need to react to warning signs and focus their attention on practices that are associated with good project management.

Project Management – People

- To be more effective the project team must be organized in a way that maximizes each person's skills and abilities.
- Two key factors in selecting a team organizational model:
 - ◆ Desired level of communication among its members
 - ◆ Difficulty level of the problems to be solved.
- Teams having a more democratic style of organization often develop novel applications more efficiently.
- It is important to understand that the larger the team, the greater the effort required ensuring effective communication and coordination of team member efforts.

Project Management – Product

- The first management activity is the determination of software scope.
- This is essential to ensure the product developed is product requested by the customer.
- Regardless of the process model followed, a problem must be decomposed along functional lines into smaller, more easily managed sub-problems.

Project Management – Process

- Once a process model is chosen, it needs to be populated with the minimum set of work tasks and work products.
- Process decomposition can occur simultaneously with product decomposition as the project plan evolves.

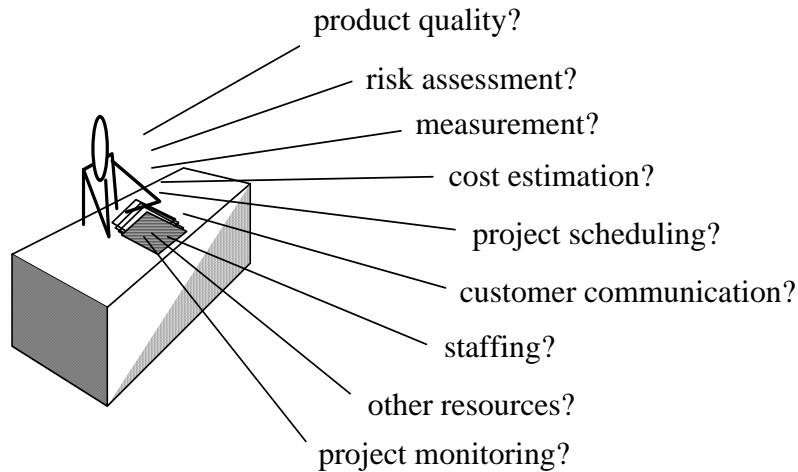
Project Management – Project

- Software engineers need to be on the watch for warning signs and take corrective action before failure occurs.
- Doing things right the first time and avoiding the temptation to cut corners to try to shorten the development cycle can avoid most failures.

Software Projects Consideration

- Size
- Delivery deadline
- Budgets and costs
- Application domain
- Technology to be implemented
- System constraints
- User requirements
- Available resources

Project Management Concerns



Key Features of Project

- Terms of Reference
- Products (Deliverables)
- Technical Approach
- Schedule
- Constraints

Project Manager Manages

- Rising Costs
- Staff Holidays
- Specification Changes
- Demands to Deliver
- Staff Morale
- Schedule Slips
- Meetings
- Budget
- Machine Availability

Project Manager Qualities

- Assertive (make decision with confidence quickly)
- Imaginative
- Good Team Leader
- Effective Planner
- Communicator
- Commercially Aware
- Good Organizer
- Calm under Pressure
- Pays Attention to Detail
- Technically Competent

Project Manager Tasks

- Project Definition
 - ◆ Establish Terms of Reference
 - ◆ Project Analysis
 - ◆ Estimate Effort & Time
 - ◆ Prepare Project Proposal
- Project Planning & Scheduling
 - ◆ Stage Analysis (Detailed Planning)
 - ◆ Update Stage Plan
- Control & Reporting
 - ◆ Monitor Progress / Quality
 - ◆ Report Progress
 - ◆ Control Progress / Quality
- Project Review
- Motivate & Support Project Team

Project Proposal

- Requirements
- Conceptual Design
- Technical Plan
- Quality Plan
- Resource Estimates
- Implementation Plan

Project Proposal – Requirements

- Introduction
- Business Objectives
- System Outline
- Main Requirements
 - ◆ Functional
 - ◆ Quality
 - ◆ Operational
- Constraints

Project Proposal – Conceptual Design for New System

- Background
- Data Model
- Process Model
- Input / Output Design
- Backup / Recovery
- Hardware / Software

Project Proposal – Conceptual Design for Enhancement

- Current System
- Data Model Changes
- Functional Changes
- New Modules
- Testing

Project Proposal – Technical Plan

- Technical Environment
 - ◆ Hardware
 - ◆ Software
- Project Approach
 - ◆ Development Model
 - ◆ Development Environment
- Client Responsibilities
- Risks, Constraints & Uncertainties

Project Proposal – Quality Plan

- Background
- Quality Control Procedures
- Individual Stages
 - ◆ Standards for Stage
 - ◆ Stage Products
 - ◆ Quality Control Activities

Project Proposal – Resource Estimation

- Background
- Estimating Method Sued
- Estimates
 - ◆ Size / Complexity
 - ◆ Effort / Cost
- Schedule
- Staffing
- Assumption & Risks

Project Proposal – Implementation Plan

- Introduction
- Project Schedule
 - ◆ Bar Charts / Network Diagrams
 - ◆ Dependencies
- Staffing Requirements
- Client Responsibility
- Assumptions

Software Teams

- The following factors must be considered when selecting a software project team structure ...
 - ◆ The difficulty of the problem to be solved
 - ◆ The size of the resultant program(s) in Lines of Code (LOC) or Function Points (FP)
 - ◆ The time that the team will stay together (team lifetime)
 - ◆ The degree to which the problem can be modularized
 - ◆ The required quality and reliability of the system to be built
 - ◆ The rigidity of the delivery date
 - ◆ The degree of sociability (communication) required for the project

Organizational Paradigms

- **Closed Paradigm** — Structures a team along a traditional hierarchy of authority
- **Random Paradigm** — Structures a team loosely and depends on individual initiative of the team members
- **Open Paradigm** — Attempts to structure a team in a manner that achieves some of the controls associated with the closed paradigm but also much of the innovation that occurs when using the random paradigm
- **Synchronous Paradigm** — Relies on the natural compartment-alization of a problem and organizes team members to work on pieces of the problem with little active communication among themselves

Defining the Problem

- **Establish Scope** — A narrative that bounds the problem
- **Decomposition** — Establishes functional partitioning

Melding Problem and Process

COMMON PROCESS FRAMEWORK ACTIVITIES	customer communication	planning	risk analysis	engineering
Software Engineering Tasks				
Product Functions				
Text input				
Editing and formating				
Automatic copy edit				
Page layout capability				
Automatic indexing and TOC				
File management				
Document production				

To Get to the Essence of a Project

- Why is the system being developed?
- What will be done? By when?
- Who is responsible for a function?
- Where are they organizationally located?
- How will the job be done technically and managerially?
- How much of each resource (e.g., people, software, tools, database) will be needed?

Critical Practices

- Formal risk analysis
- Empirical cost and schedule estimation
- Metrics-based project management
- Earned value tracking
- Defect tracking against quality targets
- People aware project management