SOFTWARE PROJECT MANAGEMENT

Course Summary

Chapter 1. SOFTWARE PROJECT MANAGEMENT. INTRODUCTION

1. Objectives. Definitions
    - 1.1 SW production activity
    - 1.2 Essential requirements for a successfully SW project
    - 1.3 Definitions: *Production Process, SW Project*
    - 1.4 2. The Need for SW Project Management
    - 2.1 Reasons to organize the SW Project development
    - 2.2 Project decomposition in constitutive activities
    - 2.3 QUALITY WHEEL (DEMING) (the phases of a development circle)
3. Processes, Activities and Tasks in a Software Project
    - 3.1 ISO/CEI 12207:1995 Standard
    - 3.2 Definitions: *Processes, Activities, Tasks*
    - 3.3 Type of processes
    - 3.4 Primary processes: *Acquisition, Supplying, Developing, Utilization, Maintenance Process*
    - 3.5 Support processes: *Documentation, SW configuration management, Quality assurance, Testing, Validation, Common analyze, Auditing, Problems solving*
    - 3.6 Organizational processes: *Management, Infrastructure, Training, Improving*
4. The Development Process
    - 4.1 Development Process Activities: *(1) Process initialization, (2)SW and system requirements analyze, (3)System architecture design, (4)Detailed SW design, (5)Coding, (6)Test of the written code, (7)System integration, (8)Integration test, (9)SW installing, (10)Validation system support*
5. Life Cycles in a SW Project Process Development
    - 5.1 The Waterfall Life Cycle
    - 5.2 The "V" Life Cycle
    - 5.3 Prototyping
    - 5.4 Evolutionary Model
    - 5.5 The Spiral Life Cycle (Boehm)
    - 5.6 Formal System Development
    - 5.7 IEEE/EIA 12207 "Standard for Information Technology - Software Life Cycle Processes"
        - 5.7.1 The Standard Software Hierarchy
        - 5.7.2 The IEEE/EIA 12207 Software Development Process
6. The Management Process
    - 6.1 Activities: *(1)Initiation and establishing of the application domain, (2)Planing, (3)Execution and control, (4)Analysis and evaluation, (5)Finalizing*
7. Leadership and management
    - 7.1 General Terms Definition
    - 7.2 Specific Terms Definition

Exercise #1

Chapter 2. TECHNOLOGIES FOR SW PRODUCTS DEVELOPMENT

1. MicroSoft TEHNOLOGY FOR SW PRODUCTS DEVELOPMENT

- 1.1 General template
  - 1.1.1 MS Presentation
  - 1.1.2 Microsoft's Philosophy
  - 1.1.3 MS Objectives
- 1.2 MS Paradigma: Frequent synchronizations and periodic stabilizations
  - 1.2.1 MS Approach Basic Paradigm
  - 1.2.2 SW Industry Trends
  - 1.2.3 The Waterfall (Sequential) Classical Development Approach
  - 1.2.4 Desired Facilities for Development Process
- 1.3 Strategies and Principles
  - 1.3.1 Overview of the Synch-and-Stabilize Development Approach
  - 1.3.2 Defining Product and Organize the Development Process. First MS Strategy
  - 1.3.3 Developing and Shipping Products. Second MS Strategy
- 1.4 MS Techology
  - 1.4.1 Objective
  - 1.4.2 Rules
  - 1.4.3 Working Manner
  - 1.4.4 MS Teams
- 1.5 Conclusions
  - 1.5.1 MS Innovations
  - 1.5.2 MS Competitive Strategies
  - 1.5.3 Microsoft Development Approach Weaknesses.
  - 1.5.4 MS Technology Advantages

2 . ORACLE TEHNOLOGY FOR SW PRODUCTS DEVELOPMENT

- 2.1 Present problems of the IT industry
  - 2.1.1 IT Industry problems
  - 2.1.2 Causes emphasized by ORACLE experience
  - 2.1.3 Conclusion
- 2.2 ORACLE set of developing methodologies
  - 2.2.1 Fundamental idea
  - 2.2.2 ORACLE set of developing methodologies
- 2.3 Project manager responsibilities
  - 2.3.1 Responsibilities
  - 2.3.2 Major tasks
- 2.4 ORACLE project phases
  - 2.4.1 Planning
  - 2.4.2 Execution
  - 2.4.3 Finalizing
- 2.5 ORACLE project processes
  - 2.5.1 The Process definition. Types of processes
  - 2.5.2 The Processes in ORACLE technology
  - 2.5.3 General remarks
- 2.6 Conclusions

3. A Rational Development Process

- 3.1 The Rational Way
- 3.2 The Overall Software Lifecycle

3.2.1 The Two Perspectives
3.2.2 Cycles and Phases
3.2.3 Iterations
3.2.4. Reconciliation of the two perspectives
3.2.5 Discriminants
3.2.6 Effort and Schedule
3.3 The Phases of the Rational Process
3.3.1 Inception Phase
3.3.2 Elaboration Phase
3.3.3 Construction Phase
3.3.4 Transition Phase
3.3.5 Evolution Cycles
3.4 Activities in the Rational Process
3.5 Lifecycle Artifacts
3.5.1 Management Artifacts
3.5.2 Technical Artifacts
3.5.3 Requirements
3.6 Examples of Rational Process
3.6.1 Rational Process for Large Contractual Software Development
3.6.2 Rational Process for a Small Commercial Software Product
3.7 Conclusion
3.8 Glossary
3.9 Acronyms
Exercise #2

Chapter 3. MANAGING SOFTWARE PROJECTS

1 Introduction
1.1 Short History
1.2 The Management of the Business
1.3 Terminology
1.4 Establishing the Ground Rules
1.5 The Contract
1.5.1 The Contract Template
1.5.2 Types of Prices
1.6 Customer Rights and Responsibilities
1.6.1 Who is the Customer
1.6.2 The Customer – Development Partnership
1.6.3 Customer Rights
1.6.4 Customer Responsibilities
1.6.5 What's about Sign-Off
1.7 Top-Down Development
1.8 An Ideal Project
1.9 Project Lifecycle
1.9.1 Col's Variant
1.10 Some Key Documents
1.10.1 Document Testing
Exercise #4

Chapter 4.1. THE DEFINITION PHASE Part 1.

1. Definition Phase Objectives
2. Problem Analysis

2.1 Recommendations for Analyze Activity
2.2 The Problem Specification Document
2.3. Analysts Tasks
3. Project Planning Activities
3.1 The System
3.1.1 Definition
3.1.2 Characteristics of a System
3.2 Planning Tools
3.2.1 Project Plan Outline
3.2.2 Bar Charts
3.2.3 Milestone Charts
3.2.4 Activity Networks
4. Software Size Estimation
4.1 Background
4.2 The Size Estimating Framework
4.2.1 The Size-Resources Relationship
4.2.2 Some Estimating Experience
4.2.3 Size Estimating Criteria
4.3 Size Estimating Methods
4.3.1 Size Oriented Metrics
4.3.1.1 Wideband-Delphy Method
4.3.1.2 Fuzzy-Logic Method
4.3.1.3 Standard-Component Method
4.3.2 Function Oriented Metrics
4.3.2.1 Function-Point Method
4.3.2.2 Conversion of Function Point to SLOC
4.3.2.3 Characteristic-Point Method
4.3.2.4 Proxy-based Estimation

Exercise #5

Chapter 4.2. THE DEFINITION PHASE Part 2

5. Software Cost Estimation
5.1 Costs Estimation Objectives
5.2 The Resources of a Software Project
5.3 Costs Elements of a Software Project
5.4 Software Costs Estimating Techniques
5.4.1 Analogy Techniques
5.4.2 Expert Judgment Techniques
5.4.3 Bottom-up Techniques
5.4.4 Top-down Techniques
5.4.5 Combined Method
5.4.6 Parkinson Law
5.6.7 Price to Win
5.5 Software Costs Evaluation Models
5.5.1 Decomposition Models
5.5.1.1 EE Model (Effort estimation)
5.5.1.2 LOC and FP Models
5.5.2 Parametric Models
5.5.2.1 COCOMO 81 Model
5.5.2.2 COCOMO II Model
5.5.2.3 PRICE S Model
5.5.2.4 SEER SEM Model
5.5.3 Cost Model Calibration

5.5.4 Cost Model Selection
5.6 Software Activity Productivity
6. Project Estimating Guide
6.1 Project History
7. Project Plan
7.1 Characteristics of a good plan
7.2 Writing the project plan
7.3 A Project Plan Outline
7.3.1 Overview
7.3.2 Phase Plan
7.3.3 Organization Plan
7.3.4 Test Plan
7.3.5 Change Control Plan
7.3.6 Documentation Plan
7.3.7 Training Plan
7.3.8 Review and Reporting Plan
7.3.9 Installation and Operation Plan
7.3.10 Resources and Deliverable Plan
7.3.11 Plan Index
8. Acceptance Criteria
Exercise #6

Chapter 4.3. THE DEFINITION PHASE Part 3

9. WBS Technology
9.1 What is WBS
9.2 Purposes of WBS
9.3 Approaches to developing WBS
9.3.1 Using guidelines
9.3.2 The analogy approach
9.3.3 The top-down approach
9.3.4 The bottom-up approach
9.4 Some basic principles to create a good WBS
9.5 How to establish the WBS
9.6 The Work Packages
9.7 Conclusions
9.8 Exercise #7

Chapter 5. THE DESIGN PHASE

1 Designing the System
1.1 The Design Specification
1.2 The Designers
1.3 The Design Environment
1.4 Design Guidelines
1.5 Designing Tools
1.5.1 Flow Charts
1.5.2 HIPO
1.5.3 Pseudocode
1.5.4 Structured Charts
1.5.5 Data Flow Diagrams
1.5.6 Decision Table
1.5.7 UML
1.5.8 Coverage matrix

1.5.9 Storage maps
1.5.10 Programming languages
1.5.11 Simulation Model
1.6. Assessing Design Quality
2. Project Planning during Design Phase
2.1 Change control
2.2 Preparation for testing
2.2.1 Defining test hierarchy
2.2.2 Top-down vs. bottom-up integration testing
2.2.3 Writing test specifications
2.2.4 Defining test procedures
2.2.5 Providing computer time
2.2.6 Plotting test results
2.3 Resource estimating
2.4 Documentation
2.4.1 Programming Manual
2.4.2 Project Library
2.5 Training
3. Design Phase Review
3.1 Preparation
3.1.1 Scheduling people
3.1.2 Scheduling meeting rooms
3.1.3 Preparing presentation aids
3.1.4 Preparing handout materials
3.2 What to Cover
3.3 Results
Exercise #9

Chapter 6.1. THE PROGRAMMING PHASE Part 1

Part I

0 Introduction
1 Programming Techniques
1.1 Structured programming
1.1.1 Goals of structured programming
1.2 Object-Oriented Programming, Design and Analysis
1.2.1 Object-Oriented Programming
1.2.2 Object-Oriented Design
1.2 3 Object-Oriented Analysis
2 Organization Modalities
2.1 Conventional Organization
2.1.1 Analysis and Design Group
2.1.1.1 Change Control
2.1.1.2 Data Control
2.1.1.3 Structured Walk-Throughs and Inspections
2.1.1.4 Simulation Modeling
2.1.1.5 User Documentation
2.1.2 Programming Group
2.1.2.1 Detailed Design
2.1.2.2 Coding
2.1.2.3 Module Test
2.1.2.4 Documentation
2.1.2.5 Integration: "Top-Down"
2.1.2.6 Integration: "Bottom-Up"
2.1.2.7 Integration: The Test specification

        - 2.1.3 Test Group
        - 2.1.4 Staff Group
            - 2.1.4.1 Technical Staff Functions
            - 2.1.4.2 Administrative Staff Functions
        - 2.1.5 The Numbers Game
    - 2.2 Team Organization. Chief Programmer Team
        - 2.2.1 How It Works
        - 2.2.2 Project Organization using Chief Programmer Team approach
- 3 Change Control
    - 3.1 Baseline Documents
    - 3.2 Control Procedures
- 4 Programming Tools
    - 4.1 Written Specifications
    - 4.2 Test Executives
    - 4.3 Environment Simulators
    - 4.4 Specialized Programming Environment
    - 4.5 Automated Documentation Aids
    - 4.6 Software and Hardware Monitors
    - 4.7 The Project Library
        - 4.7.1 General Library
        - 4.7.2 Development Support Library

Chapter 6.2. THE PROGRAMMING PHASE Part 2

Part II
- 5 The Manager's Job
    - 5.1 Technical Leadership
    - 5.2 Planning and Controlling
    - 5.3 Communicating
    - 5.4 Ensuring Work Conditions and Tools
    - 5.5 Assigning the Work
        - 5.5.1 Persons Assignment
        - 5.5.2 Domains Assignment
        - 5.5.3 Work Assignment Objectives
    - 5.6 Working Hours
        - 5.6.1 Normal Working Hours Allocation
        - 5.6.2 Supplementary Working Hours
        - 5.6.3 Flexy-Time Technique
        - 5.6.4 Dead-Line Technique
    - 5.7 Adding More People
    - 5.8 Reporting Technical Status
        - 5.8.1 Written Reports
        - 5.8.2 Oral Reviews
    - 5.9 Reporting Financial Status
    - 5.10 Training
        - 5.10.1 Technical Staff Training
        - 5.10.2 Managers' Training
    - 5.11 Appraising and Counseling
    - 5.12 Sanity Maintenance
    - 5.13 Management Levels

Exercise #10

Chapter 7. THE SYSTEM TEST PHASE

1 System Testing
- 1.1 System test specification
- 1.2 The Testers
- 1.3 Testing conditions
- 1.4 Conducting the Tests

2 Customer Training
- 2.1 Using the System
- 2.2 Maintaining the System

Exercise #11

Chapter 8. THE ACCEPTANCE PHASE

1 Acceptance Testing
- 1.1 Acceptance Test Specification
- 1.2 Acceptance Criteria
- 1.3 Execution

2 Documentation

Exercise #12

Chapter 9. THE INSTALLATION AND OPERATION PHASE

1 Site Testing

2 Conversion
- 2.1 Parallel Operation
- 2.2 Immediate Replacement
- 2.3 Cut-over

3 Maintenance and Tuning

4 Project Evaluation

Exercise #13

Chapter 10. SPECIAL CONSIDERATIONS

1 Big Projects
- 1.1 The Phases
- 1.2 Organization
- 1.3 Customer Controls
- 1.4 Configuration Management
- 1.5 Multiple Releases

2 Small Projects

3 Proposals
- 3.1 Guide for writing a proposal

Exercise # 14