Software Project Management

Lecture 15

Software Quality Assurance and Control Planning

- "What is not tracked is not done"

- The Goals of Software QAC:
  - To improve software quality by appropriately monitoring both the software and the development process that produces it.
  - To ensure full compliance with the established standards and procedures for the software and the software process.
  - To ensure that any inadequacies in the process, product and standards are brought to managements attention so that these inadequacies can be fixed

Software QAC Plan

- For each development project it specifies:
  - Its goals
  - SQAC tasks to be performed
  - Standards against which development work is to be measured
  - Software quality organizational structure
  - Software quality procedures

IEEE 730-1989 Standard for Software Quality Assurance Plans

1. Purpose
2. Reference Documents
3. Management
4. Documentation
5. Standards, Practices, Conventions and Metrics
6. Reviews and Audits
7. Test
8. Problem Reporting and Corrective Action
9. Tools, Techniques, and Methodologies
10. Code Control
11. Media Control
12. Supplier Control
13. Records Collection
14. Training
15. Risk Management

Contents of SQA Plan - Purpose

- Purpose
  - Describes the purpose of the project SQAP
  - List software covered by SQAP
  - State portion of software life cycle covered
  - Measurable Objectives (Next Slide)
  - Answers the following:
    - What is the intended use of the software (criticality, interfaces etc…)?
    - What is the scope of this SQAP?
    - How will this plan contribute to the success of the project?
    - Name the SDLC that applies to the project and deviations?

Contents of SQA Plan – Purpose (Measurable Objectives)

- Example Objectives
  - Technical review of all project documents
  - Ensure maximum inspection rates of 6 pages/hour for documentation and 200 LOC/hour for code.
  - Have a process defect yield of 99.9% before delivery.
  - Have a delivered defect density < 1 defect/1000 LOC for first 12 months of operation

Contents of SQA Plan – Management

- Organization - depict structure of org.
  - Roles
- Tasks
  - tasks to be performed
  - relationship between tasks and checkpoints
  - sequence of tasks
- Responsibilities
  - of each organizational unit

Contents of SQA Plan – Documentation

- Purpose
  - identify required documents
  - state how documents will be evaluated
- Minimum documentation requirements
  - Software Requirements Specification (SRS)
  - Software Design Description (SDD)
  - Software Verification and Validation Plan (SVVP)
  - Software Verification and Validation Report (SVVR)
  - User documentation
  - Software Configuration Management Plan (SCMP)
- Other
  - Software Development Plan
  - Standards and Procedures Manual
  - Software Project Management Plan
  - Software Maintenance Manual

Contents of SQA Plan – Standards, Practices, Conventions and Metrics

- Identify S,P,C,and M to be applied
- How compliance is to be monitored and assured
- Minimum
  - documentation standards, logic structure standards, coding standards, testing standards
  - List Selected SQA product and process metrics
    - Defects Found, Change Activity, Software Structure, Availability,…
    - Must be related to measurable objectives in Purpose Section.

Contents of SQA Plan – Reviews and Audits

- Purpose
  - define what reviews/audits will be done
  - how they will be accomplished
  - what further actions are required
- Minimum
  - Software Requirements Reviews
  - Preliminary Design Review
    - evaluate technical adequacy of top-level design
  - Critical Design Review
    - acceptability of detailed designs
  - Software Verification and Validation Plan Review
    - adequacy of planned verification and validation

Min Set of Reviews/Audits (cont)

  - Functional Audit
    - all requirements in SRS have been met
  - Physical Audit
    - software and documents are consistent and ready
  - In-Process Audit
  - Managerial Reviews
  - Software Configuration Management Plan Review (SCMPR)
  - Post-mortem review
- Other
  - user documentation review (UDR).

Contents of SQA Plan – Test

- Identify all tests that are not included in SVVP for the software covered by the SQAP and shall state the methods to be used.

Contents of SQA Plan – Problem Reporting

- Practices and Procedures for reporting, tracking, and resolving problems
- Organizational responsibilities

Contents of SQA Plan – Tools, Techniques and Methodologies

- identify the special software tools, techniques and methodologies
  - purpose
  - describe use

Contents of SQA Plan – The rest

- 10 - Code Control
- 11 - Media Control
- 12 - Supplier Control (for outsourcing)

SCMP

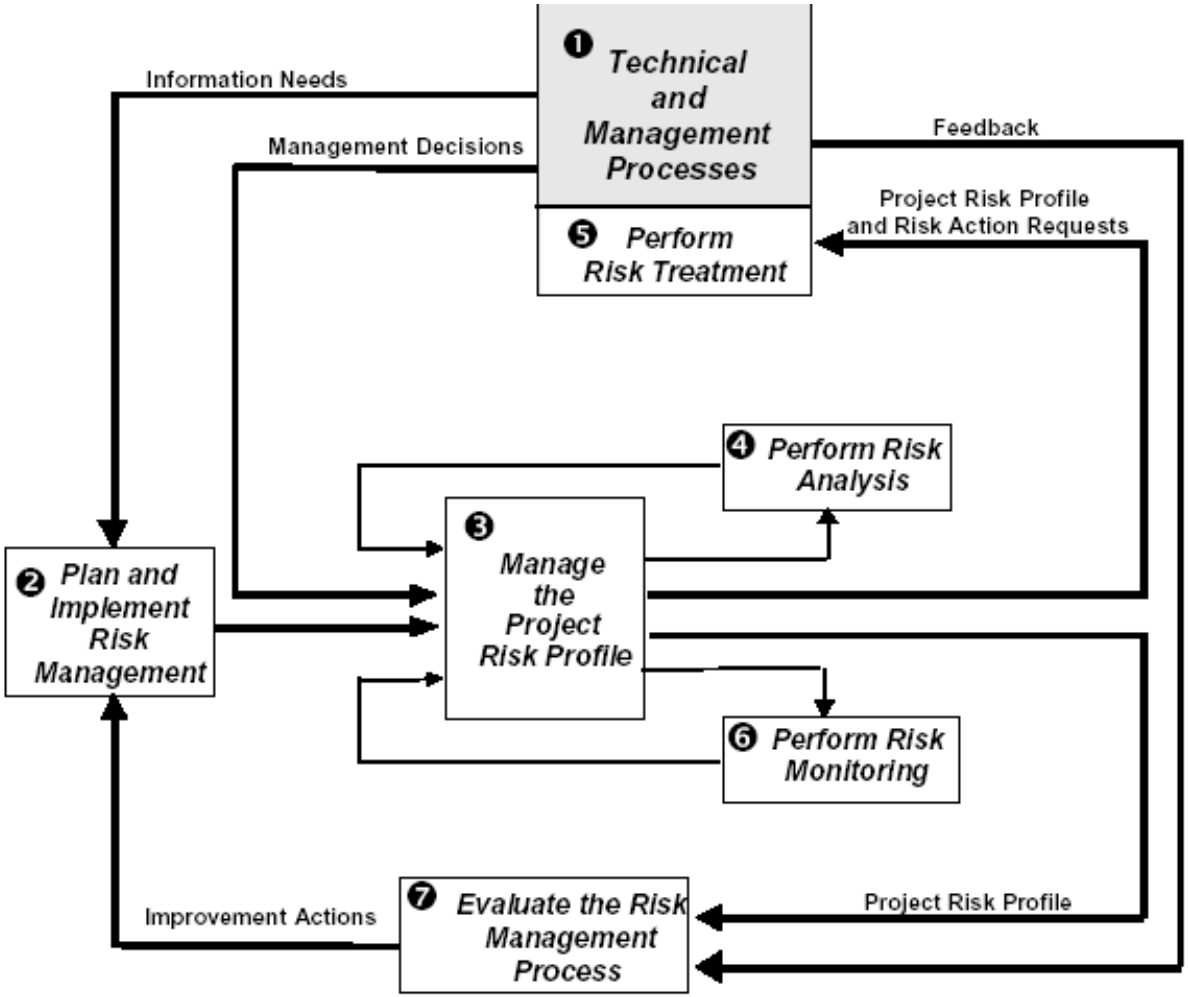
- 13 - Records - collection, maint. and retention
- 14 - Training
- 15 - Risk Management

- Code control
  - The methods and facilities used to maintain, store, secure, and document controlled versions of the identified software during all phases of the software life cycle.
- Media control
  - The media for each computer product and the documentation required to store the media, including the copy and restore process; and
  - Protect computer program physical media from unauthorized access or inadvertent damage or degradation during all phases of the software life cycle.
- Supplier control
  - Assuring that software provided by suppliers meets established requirements.
  - State the methods that will be used to assure that the software supplier receives adequate and complete requirements.
  - For previously developed software, State the methods to be used to assure the suitability of the product for use with the software items covered by the SQAP.
  - For software that is to be developed, the supplier shall be required to prepare and implement an SQAP in accordance with this standard.

The SCM Plan - IEEE Std 828-1998

- Introduction
  - Describes the Plan's purpose, scope of application, key terms, and references
- SCM management
  - Who? Identifies the responsibilities and authorities for accomplishing the planned activities
- SCM activities
  - What? Identifies all activities to be performed in applying to the project
- SCM schedules
  - When? Identifies the required coordination of SCM activities with the other activities in the project
- SCM resources
  - How? Identifies tools and physical and human resources required for execution of the Plan
- SCM plan maintenance
  - Identifies how the Plan will be kept current while in effect

Risk Management



IEEE 1540:2001 – Standard for Software Life Cycle Processes - Risk Management

• Describes a process for the management of risk during software acquisition, supply, development, operations and maintenance.

Source: IEEE Standard 1540:2001

Risk management Plan

- Table of Contents
  - Build the table of contents here. Insert it when you finish your document.
- Introduction
  - This section of the risk management plan provides the focus for risk management and mitigation within the project.
- Risk Categorization Table
  - To review the categories of risk for their project.
- Risk Ranking
  - Rank the risk to the project for each category:

- Risk Factors and Areas—Under each category, this column lists category risk factors.
- Low Risk Evidence (L)—This column has characteristics of this factor when it can be considered low-risk to the project.
- Medium Risk Evidence (M)—This column has characteristics of this factor when it provides a medium risk.
- High Risk Evidence (H)—This column has characteristics of this factor when it should be considered high-risk.
- Rating—Select the level of risk (example: H, M, L, or 3, 2,1) applicable to this project.
- Comments—Provide information about project specifics that support the rating choice.

- Key Risk Identification
  - Sort the risk table in order of risk with high-risk items first.
  - For the top ten risks, and all risks rated high if more than ten, calculate the risk exposure. These are your key risks.
  - Identify the means of controlling each key risk, and establish ownership of the action and date of completion.
  - Integrate the key risks into the project plan and determine the impacts on schedule and cost.
- Project Risk Reporting Format
- Define Ongoing Project Risk Management

Q&A