Components of Software Quality Assurance System Overview

- Schematic overview of wide range of SQA components available to planners
- Individual SQA systems will vary…
  – Organisation characteristics
  – Which projects
  – Which s/w maintenance activities
  – Professional staff involved
- SQA components
- Construction considerations

1. SQA System - Architecture

- Pre-project components
- Software project life cycle components
- Infrastructure components for error prevention and improvements
- Management SQA components
- SQA standards, system certification and assessment components
- Organizing for SQA – the human components
- Considerations guiding construction of organization’s SQA system

2.1. Pre-project SQA components - contract review

- Contract/project proposal negotiated with client
- Review must examine these
  – Clarification of requirements
  – Schedule & resources
  – Staff evaluation
  – Customers capacity wrt obligations
  – Development risks

2.2. Pre-project SQA components - development and quality plans

- Needed after signing the contract
- Changes may occur hence review wrt
  – Schedules
  – Manpower & h/w resources
  – Risk evaluations
  – Organisation issues
  – teams, subcontractors and partnerships
  – Methodology, tools etc
  – Reuse plans
3. Software Project Life Cycle Components

- Reviews
  - Formal Design Reviews (“DR’s”); Peer reviews
- Expert opinions
- Software testing
- Software maintenance components (see next slide)
  - Corrective; Adaptive; Improvement
- Assurance of the quality of external participants’ work

3.4. S/w maintenance components

- Pre-maintenance components
  - m. contract review; m. plan
- SDLC components
  - Applied for functionality improvement and adaptive maintenance tasks, similar to s/w dev process
- Infrastructure components
  - M. procedures & instructions; supporting quality devices; m. staff training, re-training & certification; m. preventive & corrective actions; m. config management; control of m. docs & quality records
- Managerial control SQA components
  - m. service control; m. quality metrics; m. quality costs

4. Infrastructure components for error prevention & improvement

- Procedures and work instruction
- Templates and checklists
- Staff training, retraining and certification
- Preventive and corrective actions
- Configuration management
- Documentation control

5. Management SQA components

- Project progress control
  - Resource usage; schedules; risk management activities; the budget
- Software quality metrics
  - Quality of s/w dev. & maintenance activities
  - Dev. team productivity
  - H desk & maintenance teams productivity
  - s/w faults density
  - Schedule deviations
- Software quality costs
6. SQA standards, system certification and assessment components

- Objectives:
  - Utilization of international professional knowledge
  - Improvement of coordination with other organizations' quality systems
  - Objective professional evaluation and measurement of the organization’s SQA achievement

- Quality management standards
- Project process standards

7. Organizing for SQA - the human components

- Management’s role in SQA
- The SQA unit
- SQA trustees
- SQA committees
- SQA forums

8. Considerations guiding construction of organisation’s SQA system

- Organisational
  - Type of s/w development (& maintenance) clientele
  - Range of products
  - Size of organisation
  - Degree/nature of cooperation with other organisations on related projects
  - Optimisation objectives

- Project & maintenance service
  - s/w complexity & difficulty
  - Staff experience with project technology
  - Extent of s/w reuse

- Professional staff
  - Professional qualifications
  - Team member acquaintance