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. 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

- 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