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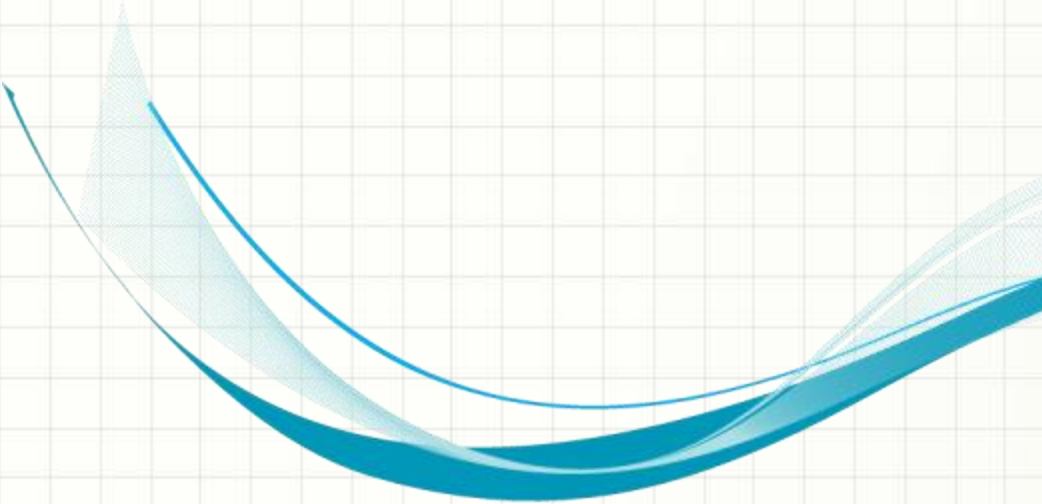
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# SOFTWARE QUALITY MANAGEMENT

## CSP587

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Computer Science



# Week 5

## SW Engineering Standards and Models

# Lesson Overview

- Software Engineering Standards and Models
- Reading:
  - Ch. 4 – SW Eng Standards and Models
- Objectives
  - Discuss the benefits of standardization
    - Establishment of best practices
    - Consistency
    - Training
    - Measurable improvement
  - Examine several key industry standards

# Topics for Discussion

- Is standardization “worth it”? Consider this from the perspective of an SQM working to establish organizational standards.
- Describe the steps necessary to implement standards within the organization.
- Discuss the role of training and tool support in maximizing the benefits of standardization.
- Describe the role of objective measurement in continuous process improvement.

# Where Do Defects Come From?

- Our defensive perimeter should include a high-quality staff
  - Knowledge of best practices
  - Proper documentation approach
  - Team coordination
  - Test strategies
  - Proper and effective tool usage
- Teaching framework
  - Training
  - Certification
  - Standardization

# Teaching Objectives

- Develop knowledge and skills
- Assure conformity
- Keep staff current
- Educate regarding SQA procedures
- Hire adequately qualified candidates



# Teaching Process

- Understand job requirements
- Determine training and updating needs
- Develop the training and updating programs
- Establish certification needs
- Plan certification processes
- Execute training, updating and certification programs
- Assess progress and improve programs

# Professional Knowledge

- Job titles
  - Analyst
  - Programmer
  - Management
  - Tester
  - Maintenance tech
- Dimensions of capability
  - Skills
  - Experience
- Knowledge of special procedures
  - Software engineering (e.g., tools, languages, etc.)
  - SQA



# Gap Analysis

- Defining requirements
  - Requirements change over time
- Measuring capabilities
  - Capabilities change over time
- Training has the potential to close the gap
  - Bring new employees up to speed
  - Retrain current employees for new assignments
  - Update current employees on the latest ...

# Training and Updating Programs

- Distinct tracks
  - Software engineering
  - SQA
- Target audience
  - New employees
  - Veterans in need of change or updating
- Scheduling issues
  - Planned vs. on-demand

# Certification

- You can't always trust the resume
  - Key positions require certitude
    - Expertise with specific tools and techniques
    - Management positions
    - Maintenance
    - Auditors
- Industry-wide acceptance of knowledge, skills, training process, etc.
  - Requirements, credits, levels, etc.
- Certification is also somewhat dynamic
  - New tools and techniques, evolutions, etc.

# Continuous Improvement

- CAPA – corrective action and preventive actions
- Goal:
  - Focus on the cause of the defect
  - Get better every time
  - Effectiveness and efficiency
  - Build up the perimeter fence
- Needs
  - Objective measurement
  - Feedback capability
  - Success criteria

# Feedback Processes

- Corrective actions
  - Reactive
  - Defect identification
  - Root-cause analysis
  - Better practices
  - Implementation results and measurement of impact
- Preventive actions
  - Proactive
  - Identify potential problems
  - Deviations from standards
  - Better practices
  - Implementation results and measurement of impact

# Gathering Data

- Collection
  - Software development process
  - Software maintenance
  - SQA infrastructure sources
  - SQM procedure sources
  - External sources
- Analysis
  - Filter for accuracy, applicability, etc.
  - Categorize and prioritize
  - Propose process improvements
  - Develop implementation and measurement plans
  - Document and disseminate



# Solutions

- Solutions must
  - Eliminate recurrence
  - Contribute to improved efficiency
- Possible approaches
  - Updating relevant procedures
  - Changes in practices
  - Move to better tools
  - Improve reporting methods
  - Training / updating staff

# Managing Outsource Partners

- Human-Human Interaction
  - HHI communication lacks structure
  - Freedom to interpret can lead to misinterpretation
  - Can requirements be gathered in other ways?
- Outsourcing issues revisited
  - Interesting things happen at boundaries
  - Might be a good place for structure, procedures, testing, automation, etc.
- Common solutions to common problems