SQA Is Not Testing

“If builders built buildings the way programmers write programs, then the first woodpecker that came along would destroy civilization.”

– Gerald M. Weinberg/Weinberg’s Second Law
Software Quality Assurance (SQA)

- **Anti-Patterns:**
  - Process steps are being skipped
  - Nobody tasked with ensuring SW process is actually being followed
  - Less than 5%-6% of effort on SQA

- **SQA responsibilities:**
  - Define & maintain software process definition
  - Train on process and related skills
  - Audit to ensure process is being followed
  - Keep metrics & diagnose process-related failures
  - Coach/intervene to fix process failures

<table>
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<tr>
<th>DEFINE</th>
<th>TRAIN</th>
<th>AUDIT</th>
<th>DIAGNOSE</th>
<th>FIX</th>
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Every process step produces artifacts
- If it’s not written down, it didn’t happen
  - Audit says “yes, it happened”
- Artifacts must be lightweight but useful
  - Artifacts are the arrows on V diagram

Process quality audits are more subtle
- Some information from quality of written artifacts
  - Completeness – were all required fields filled out?
  - Internal consistency checks, e.g., traceability
- Some information indirectly via process-related metrics
  - Are defects escaping to later process stages?
- Sometimes direct observation (e.g., randomly attend peer reviews)
SQA Personnel As Coaches

- SQA defines the process
  - With inputs from all stakeholders!
  - Keeper of the process diagram
  - Create/maintain templates and work aids

- SQA conducts training
  - Initial training for new team members
  - Remedial coaching, guidance, etc. for process failures

- SQA keeps records & metrics to ensure process is on track
  - Metrics should encourage high quality work products
  - Better to coach problems than punish them
One Reason Process Matters

Poor process:
- Bugs escape to field

Testing:
- Can’t even look for bugs until it’s expensive to find and fix them

Peer Reviews:
- Find bugs while it is still cheap to do so

Relative Cost to Fix Defects

- Requirements: 1x
- Design: 5x
- Coding: 10x
- Unit Test: 20x
- System Test: 50x
- Maintenance: 200x

Source: Davis 1993

Product Development Stages

Defect Fixes Are Cheap!

Defect Fixes Are Expensive!
SQA Best Practices

- SQA must have broad view of quality
  - Define & maintain processes
  - Audit & measure process effectiveness
  - Train & intervene to keep process conformance on track
  - About 5%-6% of staffing for SQA

- SQA pitfalls
  - SQA is not testing (product defects); it’s about process defects
  - Avoid form over substance; technical quality matters!
  - Beware adversarial role of SQA (the “Process Police”)
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Essential Quality Assurance

@ThePracticalDev

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Can you take a look at the bug I just opened?

Uh oh.

Is this a normal bug, or one of those horrifying ones that prove your whole project is broken beyond repair and should be burned to the ground?

It's a normal one this time, I promise.

OK, what's the bug?

The server crashes if a user's password is a resolvable URL.

I'll get the lighter fluid.

https://xkcd.com/1700/