"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
YOU ARE HERE

SPECIFY PRODUCT

SPECIFY SOFTWARE

CREATE SW ARCHITECTURE

DESIGN MODULES

IMPLEMENT

UNIT TEST

INTEGRATION TEST

SOFTWARE TEST

ACCEPTANCE TEST

PRODUCT

TRACEABILITY & VALIDATION

Test Plan & Test Results

Test Plan & Test Results

Test Plan & Test Results

Integration Test Results

Unit Test Results

Source Code

Detailed Design

Test Results

Test Plan & Test Results

Software Test Results

IS YOUR PROCESS DEFINED?

IS IT WORKING?
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
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

Relative Cost to Fix Defects

- 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
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”)
Essential

Quality Assurance

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CAN YOU TAKE A LOOK AT THE BUG I JUST OPENED?

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/