Shoestring Manual Testing

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Rex Black Consulting Services, Inc.
http://www.RexBlackConsulting.com
Rex_Black@RexBlackConsulting.com

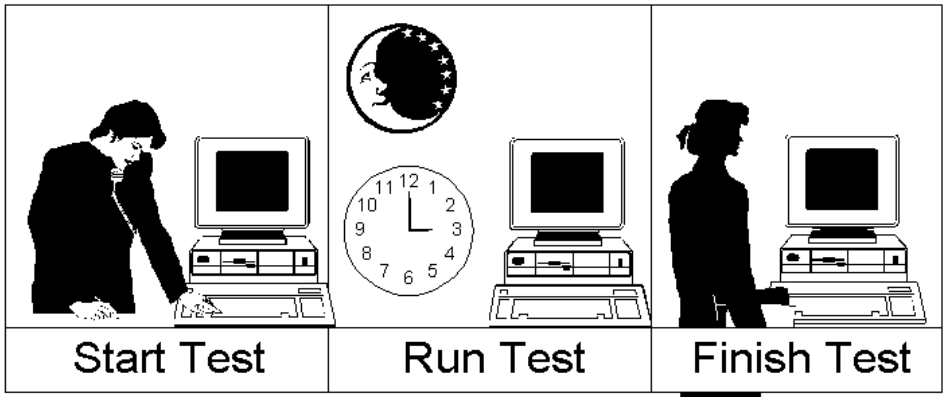
31520 Beck Road
Bulverde, TX 78163-3911
+1 (830) 438-4830

Manual Testing

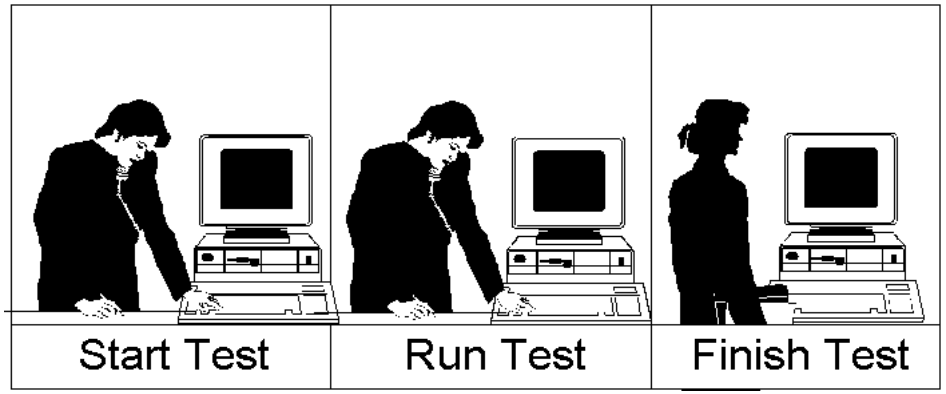
- Definition: Developing and executing tests that rely primarily on direct and continuous human interaction, especially evaluating correctness and test status (pass, fail, warn, etc.)
- Contrast automated testing: Developing and executing tests that can run unattended, including comparing actual to expected results and logging status
- Note: Manual testing may involve the use of tools
  - To create specific test conditions like load or errors
  - To capture performance statistics or internal states

What Automated and Manual Testing Look Like

- When Testers
  - Start test scripts
  - Leave tests running unattended
  - Return for results



➢ It's Automated Testing



- When Testers
  - Enter data
  - Observe behaviors
  - Actively run tests

➢ It's Manual Testing

The Mirage of Total Automation

- Complete test automation seems ideal
  - Start test, let it run, finish test, analyze results
  - Minimal effort to run the tests
- Obstacles to total test automation
  - System under test is changing frequently
  - No budget or time for test script development
  - Lack of suitable or justifiably-priced tools
  - Insufficient skill or experience on test team
  - Critical quality risks not amenable to automation

Challenges of Manual Testing

- How do you staff the manual test team?
- What do test neophytes need to know?
- Can you maximize use of scarce equipment with manual testing?
- Can you sell management on the plan?
- What technical and managerial pitfalls exist for manual testing?

⇨Let's see how to conquer the challenges

Sizing the Manual Test Effort

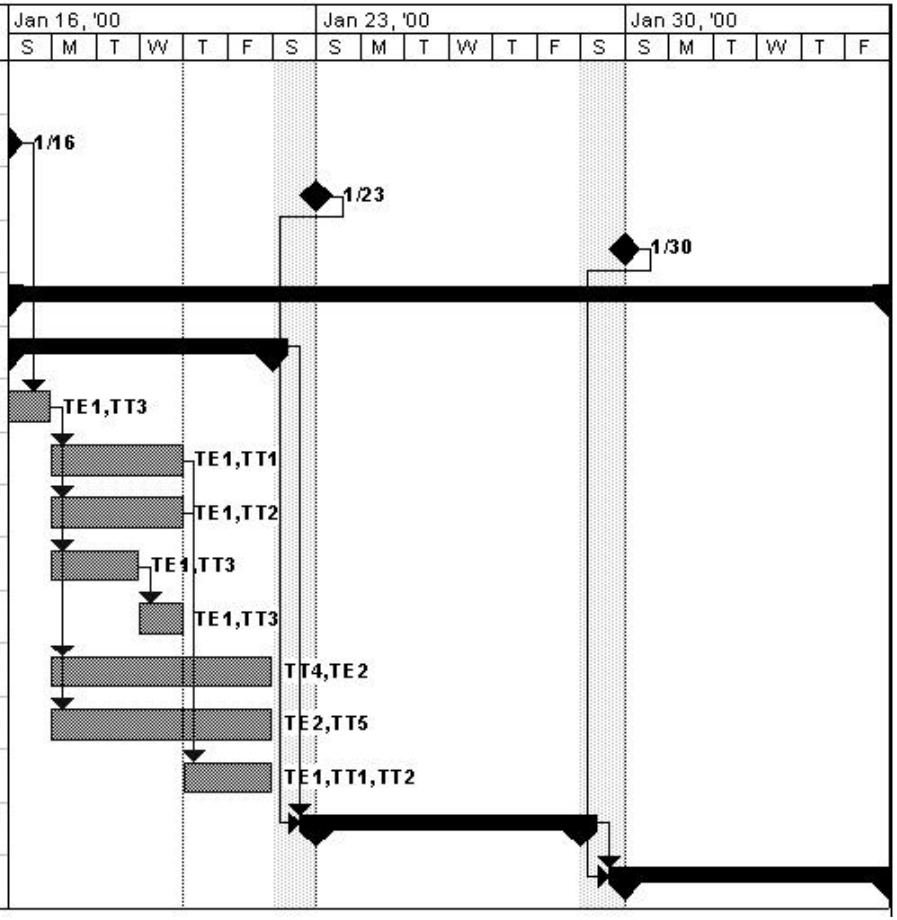
Given a set of tests to run in a period of time, plan number of techs needed

- Test considerations
  - For each test case, know…
    - ✓ Person-hours effort
    - ✓ Wall-clock duration
    - ✓ Dependencies and prerequisites
- Use project-planning software to create schedule, keeping in mind...

- Project considerations
  - For process and team, know overhead of…
    - Reporting bugs
    - Documenting test status
    - Communication, e-mail and management guidance
    - Breaks
    - Blocking issues/debugging
- Rules of thumb
  - 6 test hrs/8-10 hr day
  - 75% downtime (bad SW), 25% (good SW)

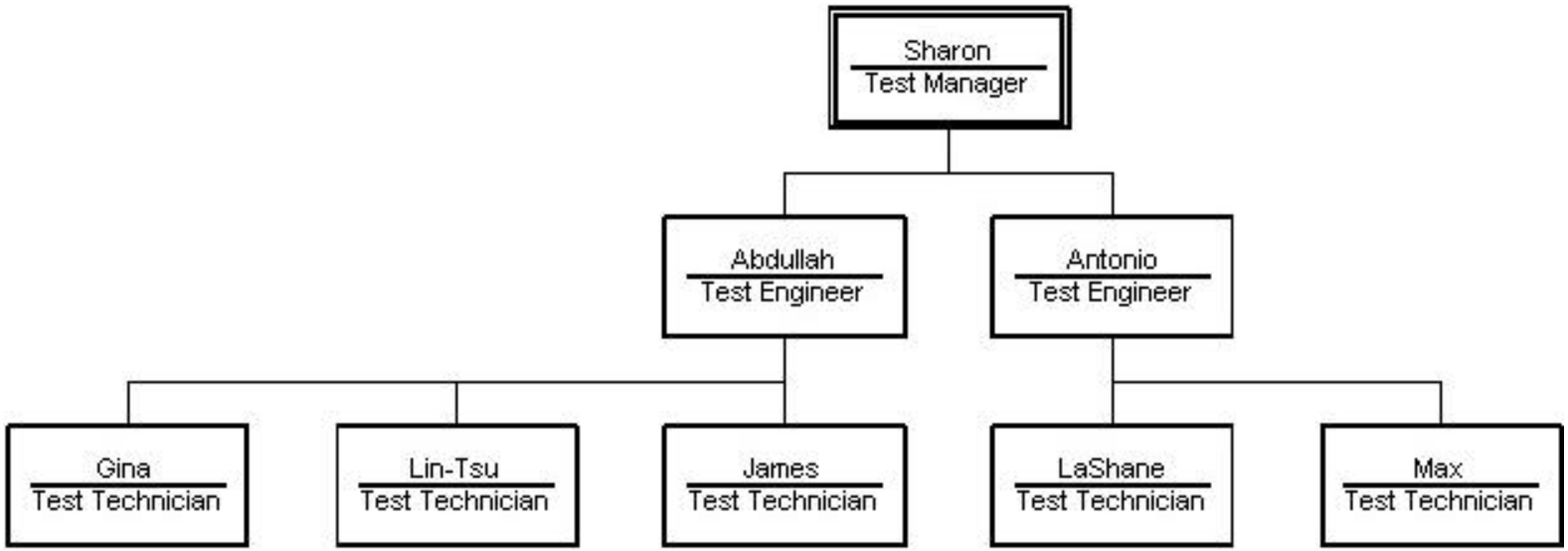
Example Gantt Chart

ID	Task Name	Duration	Start
1			
2	Build ST.1	0 days	Sun 1/16/00
3	Build ST.2	0 days	Sun 1/23/00
4	Build ST.3	0 days	Sun 1/30/00
5	**System Test**	**18 days**	**Sun 1/16/00**
6	**Pass One**	**6 days**	**Sun 1/16/00**
7	Installation	1 day	Sun 1/16/00
8	Functionality	3 days	Mon 1/17/00
9	Use Cases	3 days	Mon 1/17/00
10	Config/compatibility	2 days	Mon 1/17/00
11	Operations/Maint	1 day	Wed 1/19/00
12	Localization	5 days	Mon 1/17/00
13	Documentation/help	5 days	Mon 1/17/00
14	Error Handling	2 days	Thu 1/20/00
15	**Pass Two**	**6 days**	**Sun 1/23/00**
18	**Pass Three**	**6 days**	**Sun 1/30/00**



- This schedule shows details for Pass One of System Test only
- No test case development time is shown, but is usually required
- Test accepts a single build for each System Test pass only

Example Org Chart



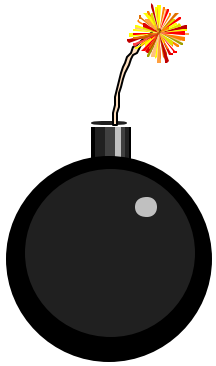
- Test manager has overall responsibility for team
- Test engineers provide technical leadership and oversight
- Test technicians do most of the actual manual test execution

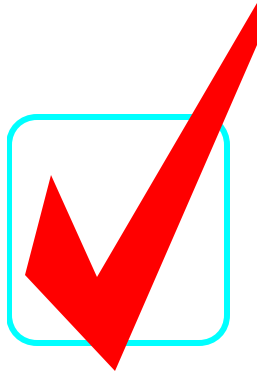
Finding Good Test Technicians

- College and technical school students and grads
  - ☺ Engineering and CS majors are especially eager
  - ? Students may not be able to commit enough time
- Technical and customer support staff
  - ☺ Understand the problems customers face
  - ? May want to solve problems, not just identify them
- Moonlighters
  - ☺ Can bring valuable experience from other jobs
  - ? May not stay focused at night; may be pulled away by “real job”
- Data entry personnel
  - ☺ Usually experienced computer users
  - ? May not be curious enough to dig into problems

Training Test Technicians

- Some processes are specific to SUT or company
  - Getting a network login
  - Badges and security
  - Using e-mail
  - Navigating the telephone system
  - ✓ Document these processes or assign mentors
- Some processes are universal
  - Manual test case execution
  - Bug reporting
  - ✓ Document, train, and coach for these skills





Training: Manual Test Case Execution

- Internal considerations
  - Level of ambiguity in tests
  - Amount of ad hoc exploration desired
  - Duration and effort of tests
  - Test states (pass, fail, etc.)
- External considerations
  - Preventing test overlap and gaps
  - Updating test status
  - Assignment of test cases
  - Handling dependencies between test cases

Attend to the individual tests and the overall testing process for successful manual test execution.

- Specifics depend on:
  - Test repository
  - Status reporting
  - Staff skills
  - Testing philosophy
- Document process
  - 1-2 pages should suffice

Training: Writing Bug Reports

A 10-step process for accurate, concise, thoroughly-edited, well-conceived, high-quality bug reports:

- Structure. Test deliberately, take notes
- Reproduce. Verify bug three times, report if intermittent
- Isolate. Change key variables, check effect
- Generalize. Check for similar failure modes
- Compare. Test previous versions and reference platform
- Summarize. Put a "bumper-sticker" on report
- Condense. Eliminate extraneous steps or words
- Disambiguate. Replace vague, misleading, or subjective words
- Neutralize. Convey facts, not opinions, guesses, or sarcasm
- Review. Submit report for review by test peers

Also, remember that poor grammar and spelling can distract readers or render ridiculous an otherwise-excellent report

Project Realities, Training Consequences

- Test technicians are often added late
  - ∴ Training must be done “on the job”
- Test engineers can only ramp up one or two technicians at once
  - ∴ Stagger technician hires by a week or two
- Ramp up time is a productivity hit for the whole team
  - ∴ Take training productivity impacts into account when planning test case progress

Multiple Shifts

- Use of night (about 4PM to 1AM) and/or graveyard (about 12AM to 9AM) testers
- Reasons to consider multiple shifts
  - ☒ Schedule: More tests done in one day
  - ☒ Resources: Shortage of hardware platforms
  - ☒ Preference: Some technicians want to work off-hours
  - ☒ Politics: Provides extensive test coverage, but less burn-out, since testers work 8-10 hours
- Considerations
  - Make the shift offered clear in the interview
  - Offer “undesirable hours” bonuses
  - Overlap shifts for hand-offs
  - Work extra-hard to create a team atmosphere

Technical Caveats

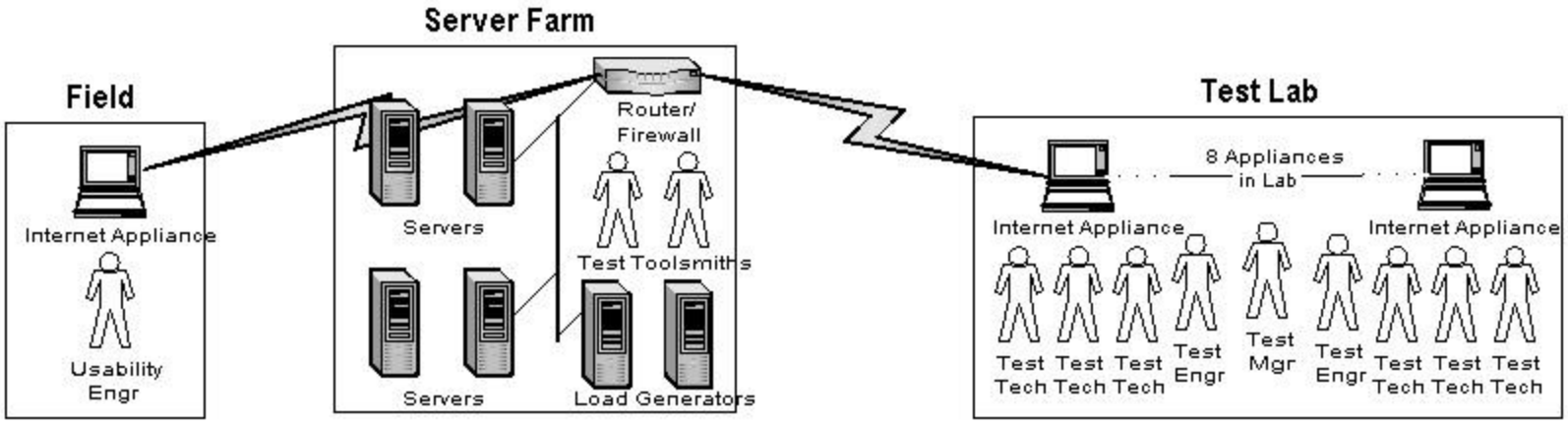
- Tests Well-Suited for Manual Testing
  - Functional
  - Use cases (user scenarios)
  - Error handling and recovery
  - Localization
  - User interface
  - Configurations and compatibility
  - Operations and maintenance
  - Date and time handling
  - Installation, conversion, and setup testing
  - Documentation and help screens
- Tests Poorly Suited for Manual Testing
  - Monkey (or random)
  - Load, volume, and capacity
  - Reliability and stability (MTBF)
  - Code coverage
  - Performance
  - Standards compliance

Caution: Using manual testing inappropriately can mislead people about the extent of test coverage

Management Caveats

- Monitor performance and behavior of inexperienced technicians
  - ✓ Some junior people won't work out
  - ✓ Reassignment or removal sometimes needed
- Pay attention to evening and graveyard shifts, including personnel dynamics
  - ✓ Out of sight isn't out of mind for long when conflicts arise
- Some tests require extensive domain knowledge
  - ✓ Most junior technicians don't have this expertise
  - ✓ Technicians can cover non-expert test suites
- Provide a career path for long-term technicians
  - ✓ Advanced them into test engineer positions
  - ✓ Provide career paths to other groups in the company

Case Study: Internet Appliance



- Test team fielded to test Internet appliance
  - Six test technicians
  - Two test engineers supervising the test technicians
  - Test manager oversees entire team
  - Toolsmiths create and run load simulation tools
- Full pass: 2 weeks, ~300 manual cases, ~400 person-hours
- Also 2-3 day Smoke Tests and 1 week Validation Tests

Selling Management

- Make a business case for manual testing
- Include the following factors in your presentation
  - ✓ Flexibility and responsiveness: Technicians join the team and become productive quickly
  - ✓ Cost and coverage: Cheaper technicians means greater test coverage on the same budget
  - ✓ Schedule: Test cycle time reduced
  - ✓ Staff retention: Test engineers burn-out reduced
  - ✓ Doing good while doing well. Help inexperienced people jump-start technical careers

➔ Bring your manager a solution to testing problems in the form of a plan for manual testing

Conclusions

- Full test automation is not always possible
- Manual testing is an effective and economical alternative
- Manual testing involves facing some unique but tractable challenges
- Proper planning of the manual effort and training of the technicians are critical
- Manual testing can solve problems for you *and* for management