Automation and the Magic of Metrics

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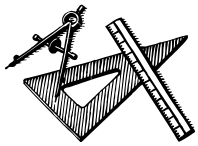

Your Presenter…

Bob Crews

- President of Checkpoint Technologies, Inc.
- Has spoken worldwide on subject of test automation and planning
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About Checkpoint Technologies

- HP Business Partner (Reseller)
- HP Authorized Training Partner
- Provide software and services to organizations throughout the United States
- Services include staff augmentation, consulting, training, and mentoring
- Developers of HP training courses and HP certification exams

Presentation Objectives

- We will cover:
  - Different types of metrics
  - Important metrics to track for comparison purposes
  - Metrics to determine and track ROI
  - Direct and indirect ROI

Why Are Metrics Gathered?

- Comparison
  - Which process, solution, resource, etc. is “better”?
- R.O.I.
  - Is a return-on-investment being realized?
- Progress
  - Are we on track with meeting our goals and target dates?
- We’ll focus on and discuss Comparison and R.O.I. metrics

"Measurements are not to provide numbers but insight"
- Ingrid Bucher

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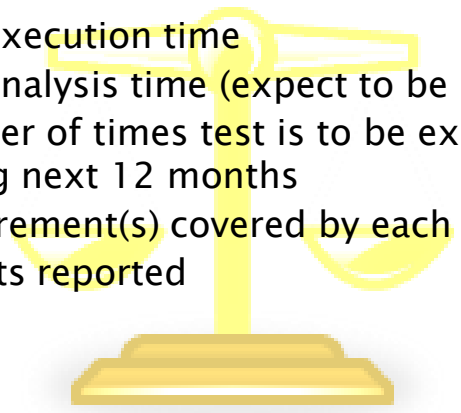
Comparison Metrics Capture for Each Manual Test



- Test execution time
- Test analysis time (expect to be low)
- Number of times test is to be executed during next 12 months
- Requirement(s) covered by each test
- Defects reported

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Comparison Metrics
Total of All Manual Tests

- Total number of test cases
- Total number of regression test cases
- Regression test cases executed (on average) during regression run
- Regression test cases NOT executed (on average) during regression run
- Defects reported (on average) during regression run
- Defects rejected (due to tester error)
- Regression testing time

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Comparison Metrics
Manual Testing Resources

- Average hourly cost for testing personnel resources
  - Employee (hourly rate * 1.4)
  - Contractor
- Average number of personnel resource hours spent on testing activities
- Hardware costs
- Software costs

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Comparison Metrics
Each Automated Test

- Test execution time
- Test analysis time
- *Maintenance time*
- Requirement(s) covered by each test
- Defects reported
  - *In QA (test environment)*
  - *In Production*

Comparison Metrics
All Tests (Automated and Manual)

- Total number of test cases
- Total number of regression test cases
- Regression test cases executed (on average) during regression run
- Regression test cases NOT executed (on average) during regression run
- Regression testing time

Comparison Metrics
All Tests (Automated and Manual)

- Defects reported (on average) during regression run
- Defects rejected (due to tester error)

Comparison Metrics
Testing Resources

- Average hourly cost for testing personnel resources
  - Employee (hourly rate * 1.4)
  - Contractor
- Average number of personnel resource hours spent on testing activities
- Hardware costs
- Software costs (include maintenance)

Should Manual Test be Automated?

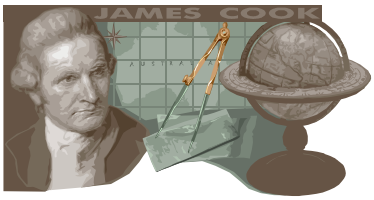
- Assuming manual test environment is supported by automation software
- Keep in mind automated process might be able to validate greater number of conditions
- Indirect benefits

Good Candidates for Automation

- Tests run for every build of application
- Tests using multiple sets of data
- Tedious and prone to human error
- Manual execution time (long term) will be greater than “time to automate + time to execute automated test”

Good Candidates to Leave Manual

- One-time testing
- Ad-hoc testing
- Emergency testing
- Tests without predictable results
  - Exploratory testing is great but typically is not a good candidate for automation



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R.O.I. Metrics

Manual Costs

Task
Execution cost : Resource Hrly Cost * Test Execution Time * Estimated Times to be Executed (yearly)

Automation Costs

Task (Add the following)
Automation Development cost: Resources cost * Time to automate (and maintain)
Execution cost : Resource Hrly Cost * Test Execution Time * Estimated Times to be Executed (yearly)
Software allocation: X% of software cost (X depending on number of automated tests)
Total

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R.O.I. Metrics

If automated test is validating X times more conditions than multiply first year ROI by X to determine more accurate ROI.

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Actual R.O.I. Example

Real case scenario: Fortune 500 Financial Firm

- B.A. validates random selection of 60 (out of 600) mortgage records. Each record with 56 fields.
  - Analysis performed monthly (no end in sight)
  - High calculation
  - 18 – 24 hours to perform analysis
  - Tedious and error prone
  - Perfect candidate for automation

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Automation Process and R.O.I.

- 30 hours to automate
- *Direct R.O.I.*
  - 30 minutes to execute and 1 – 3 hours to analyze for total of 1.5 – 3.5 hours monthly.
  - Can be scheduled to run remotely and unattended! (Therefore not requiring B.A.'s time.)
  - Validates – not 60 random records but ALL 600 records!!!
- *Indirect R.O.I.*
  - B.A. can perform other tasks
  - Decrease in errors
  - More records validated – greater coverage!

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R.O.I. Realized (1st Year)

Before Automation

Task	Cost
Analysis: $30 (hourly salary) * 24 (hrs) * 12 (yearly executions)	**$8,640**

After Automation

Task	Cost
Automation: $90 (Consult. rate) * 30 (hrs)	$2,700
Analysis & Maintenance: $30 (hourly salary) * 3 (hrs) * 12 (yearly analysis)	$1,080
Software allocation: 10% of cost	$1,000
Total	**$4,780**

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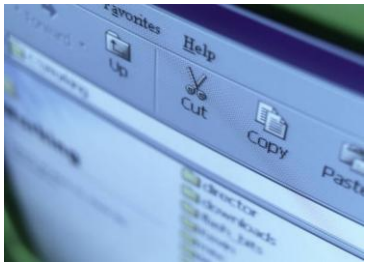
R.O.I. Calculated

Can we multiply ROI by ten since we validate 10X the number of records?

If you agree – first year ROI equals **$38,600**!!!

Indirect R.O.I.

- More difficult to quantify
- Examples
  - Decrease in tester errors
    - Decrease in rejected defects?
  - Tester can perform other tasks
    - Decrease in hours on testing activities?
  - Benefit of more conditions validated
    - Increase (initially) in defects?
  - Better software



Unattended and Remote Execution

- Tester executes 24 manual tests (1 hour each) on one workstation
- Total execution time = ***24 hours***
- Total tester time = ***24 hours***

- Tester "kicks off" 24 automated tests (10 minutes each) on two workstations to run at 1:00 am.
- Total execution time = **2 *hours (on each machine)***
- Total tester time = ***5 minutes***

Manual	Automated

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Automation Assessment

- Remember the "good candidates for automation" criteria
- Look at next 12 months
  A. Assess manual process "time"
     - How many times will requirement(s) be tested?
     - How much time does it take to execute test manually?
     - Multiply the two
  B. Assess automation process "time"
     - How much time will it take to automate (dev and maintain)?
     - How much time will it take to execute automated test?
     - Multiply the two
  C. Compare A and B – if A is greater it's probably smart to automate

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Automation Assessment

- Don't forget benefits of:
  - Remote and unattended execution
  - Greater number of conditions can be tested
- Difficult to assign a value

Summary

- Use metrics to track success of automation versus manual testing
- Capture metrics for comparison and ROI
- Compare "cost" of manual to automated over long term
- Report indirect benefits
- Consider benefits of remote and unattended execution (of automated tests)

Thank you!

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