

Automation and the Magic of Metrics

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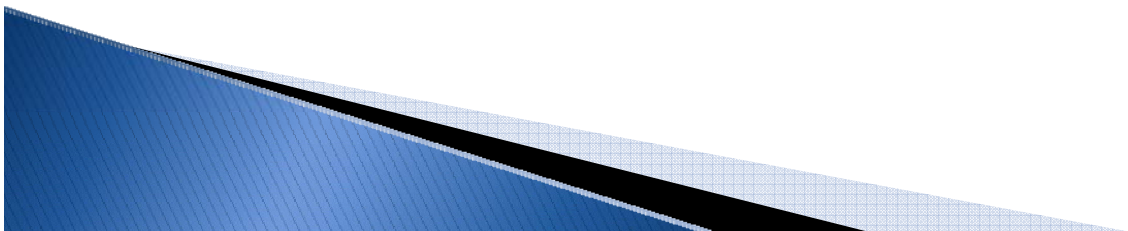
Presentation Objectives

- ▶ 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?

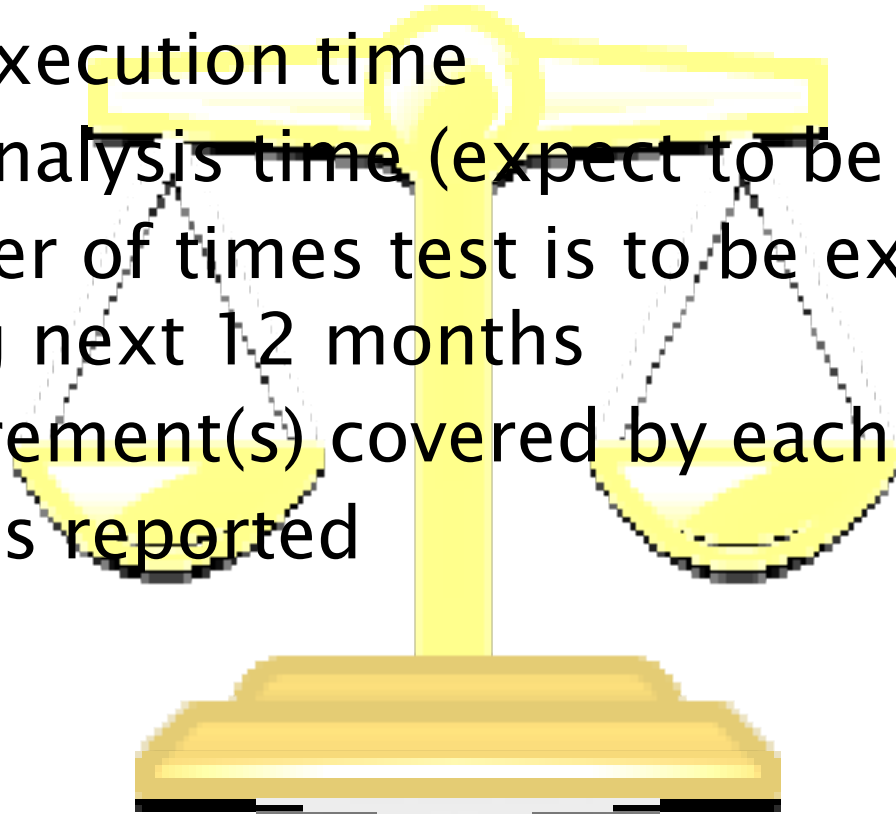
- ▶ Comparison
 - Which process, solution, resource, etc. is “better”?
- ▶ R.O.I.
 - Is a return-on-investment being realized?
- ▶ Progress
 - Are we on track with meeting our goals and target dates?
- ▶ We'll focus on and discuss Comparison and R.O.I. metrics



Comparison Metrics

Capture for Each Manual Test

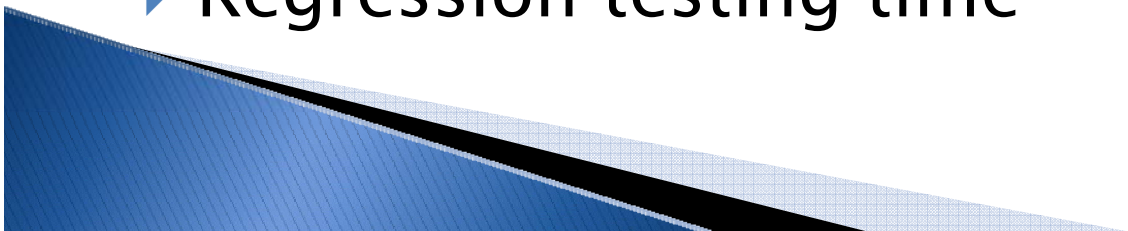
- ▶ Test execution time
- ▶ Test analysis time (expect to be low)
- ▶ Number of times test is to be executed during next 12 months
- ▶ Requirement(s) covered by each test
- ▶ Defects reported



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



Comparison Metrics

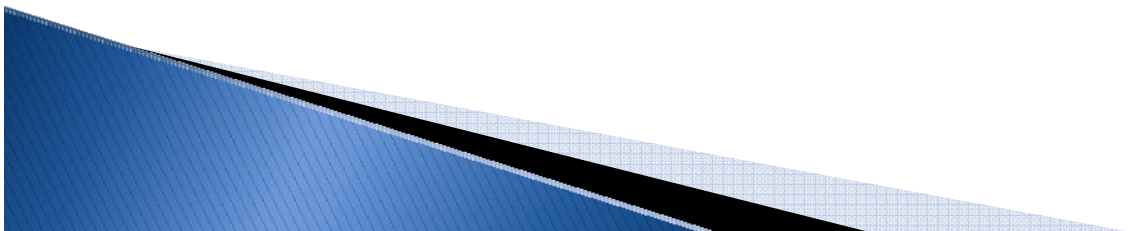
Manual Testing Resources

- ▶ 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



Comparison Metrics Each Automated Test

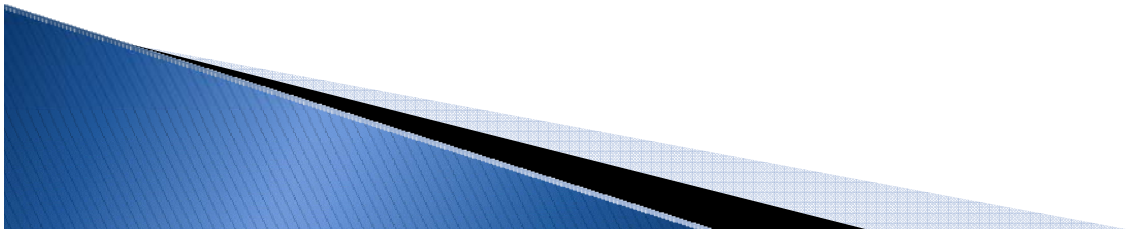
- ▶ Test execution time
- ▶ Test analysis time
- ▶ Requirement(s) covered by each test
- ▶ Defects reported



Comparison Metrics

All Tests (Automated and Manual)

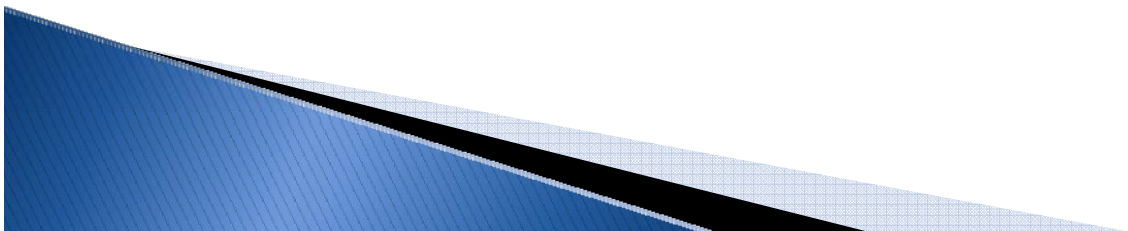
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- ▶ Total number of regression test cases
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Comparison Metrics

All Tests (Automated and Manual)

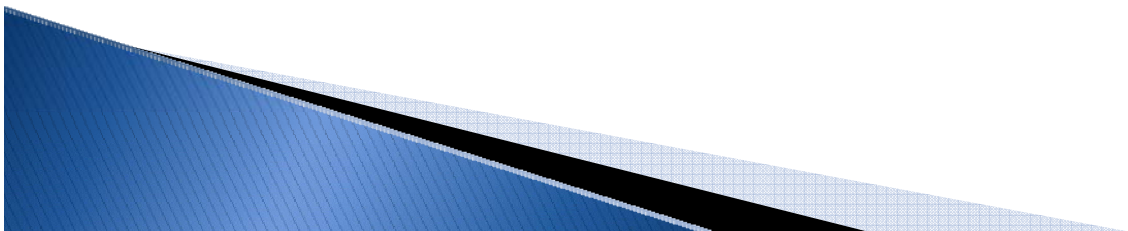
- ▶ Defects reported (on average) during regression run
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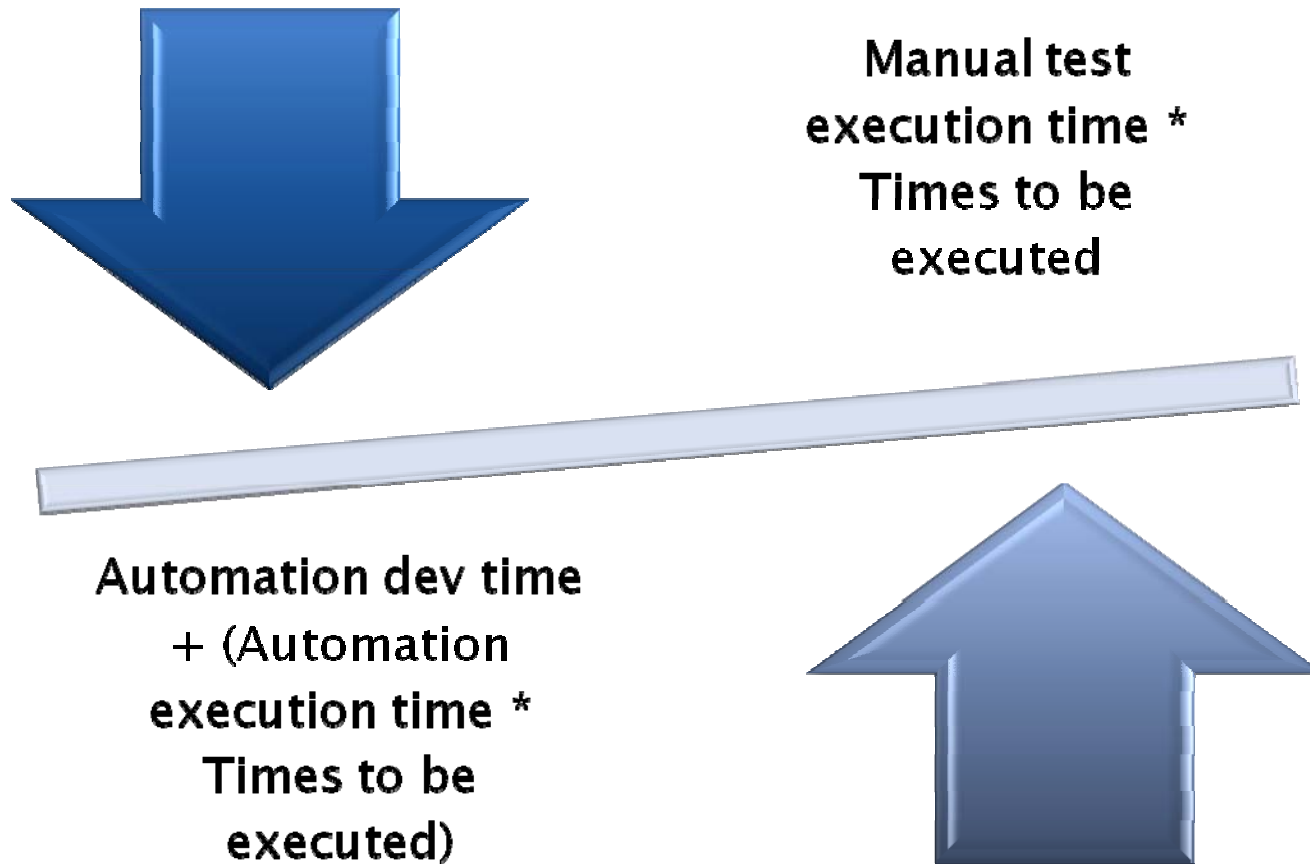
Comparison Metrics

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)

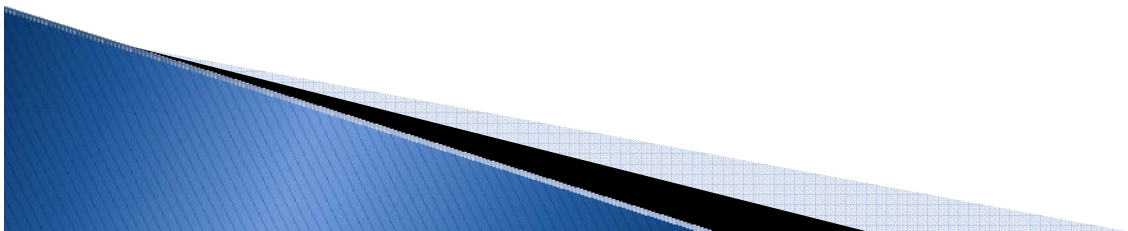


Should Manual Test be Automated?



Should Manual Test be Automated?

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



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

R.O.I. Metrics

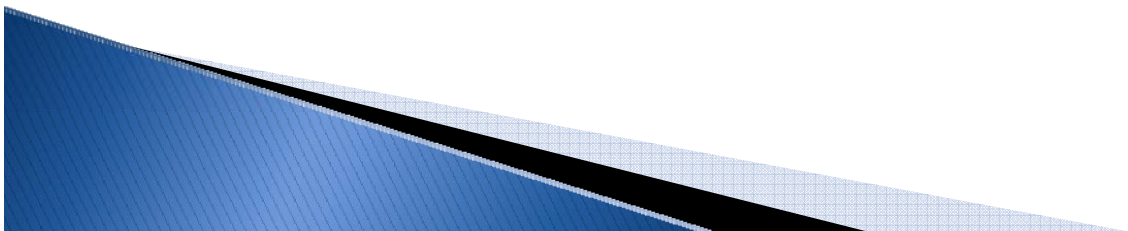


If automated test is validating X times more conditions than multiply first year ROI by X to determine more accurate ROI.

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



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!



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

Before Automation

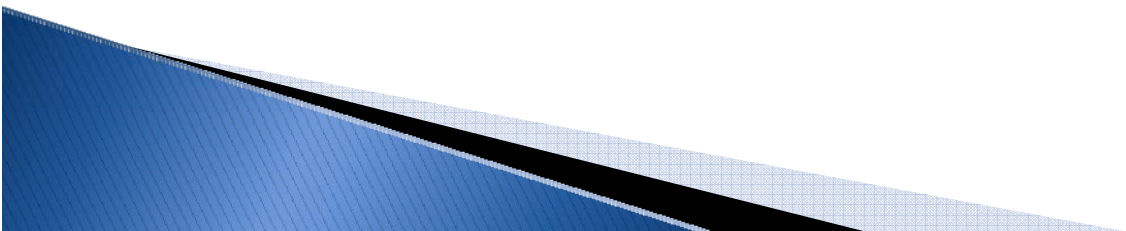
Task	Cost
Analysis: \$30 (hourly salary) * 24 (hrs) * 12 (yearly executions)	\$8,640

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

Indirect R.O.I.

- ▶ More difficult to quantify
- ▶ Examples
 - Decrease in tester errors
 - identify by seeing decrease in rejected defects?
 - Tester can perform other tasks
 - Identify by seeing decrease hours on testing activities?
 - Benefit of more conditions validated
 - Identify by (initial) increase 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

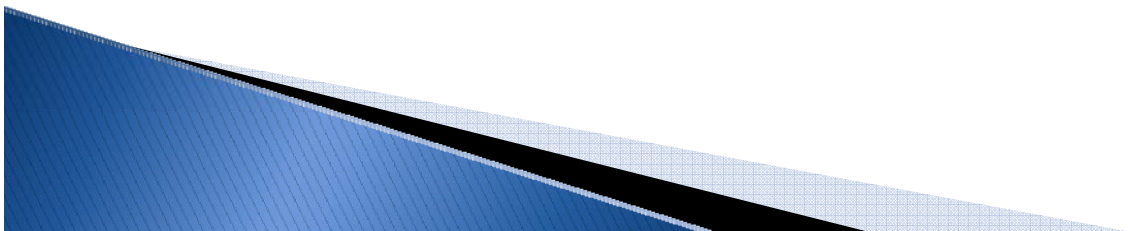
Automated

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?
 - 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

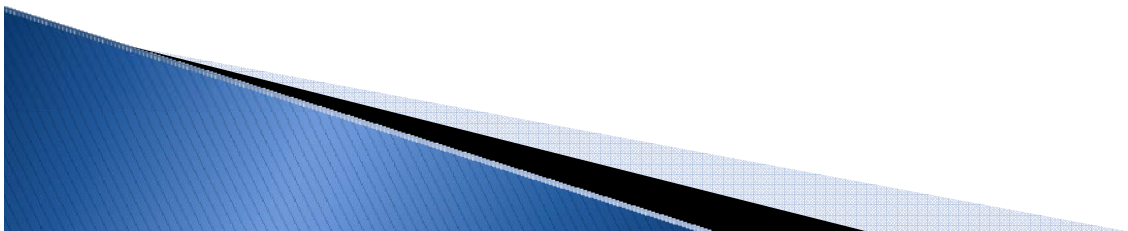
Automation Assessment

- ▶ 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)





Questions

Thank you!

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