Testing Automation: The Big Picture

THE BUSINESS VALUE OF AUTOMATED TESTS

Overview

What is automated testing?

High level benefits

Considering the total cost of ownership

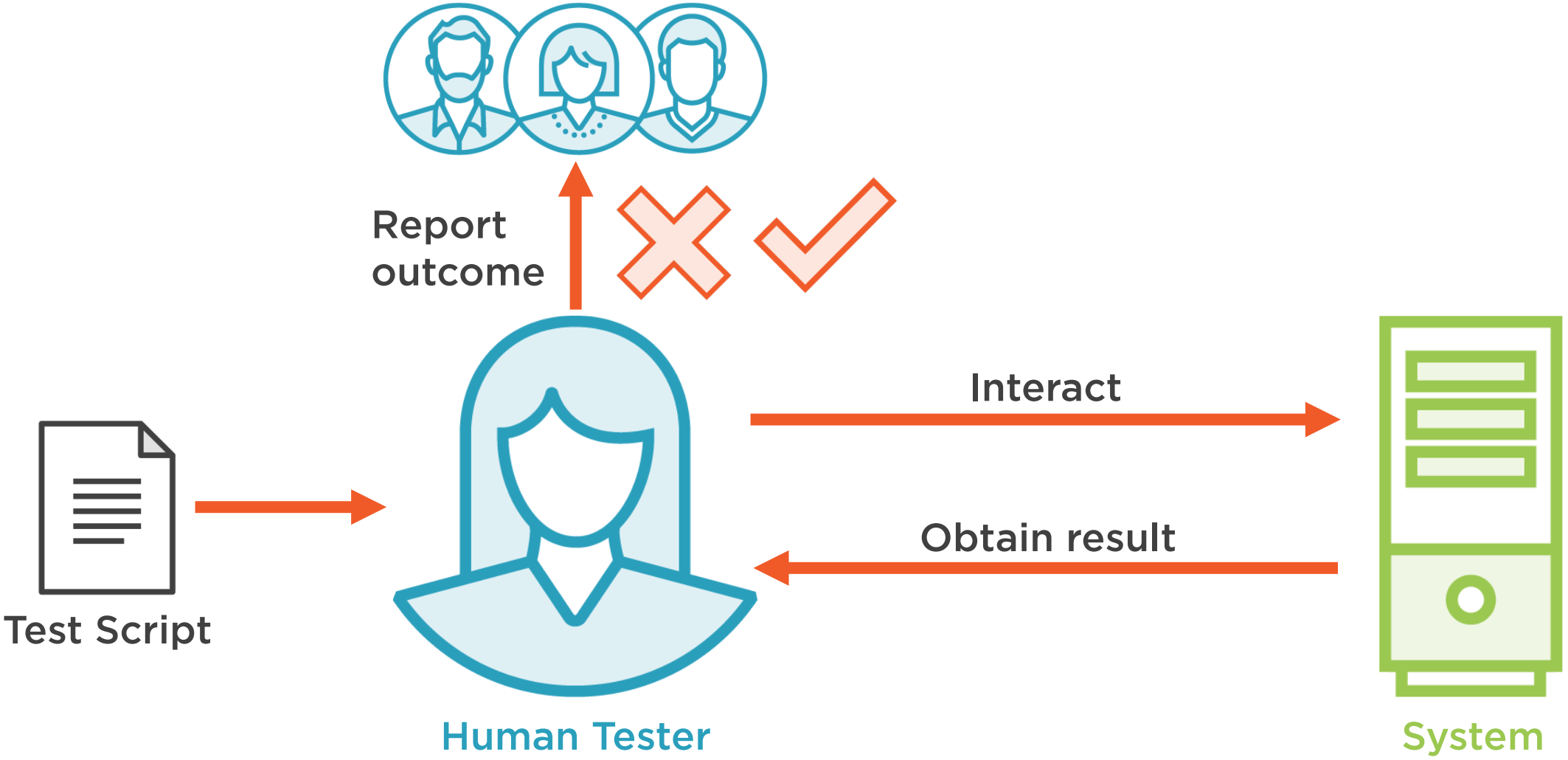
The happiness factor

Automated testing in the wider context

Considerations

Short versus long-term delivery speed

What Is Automated Testing?



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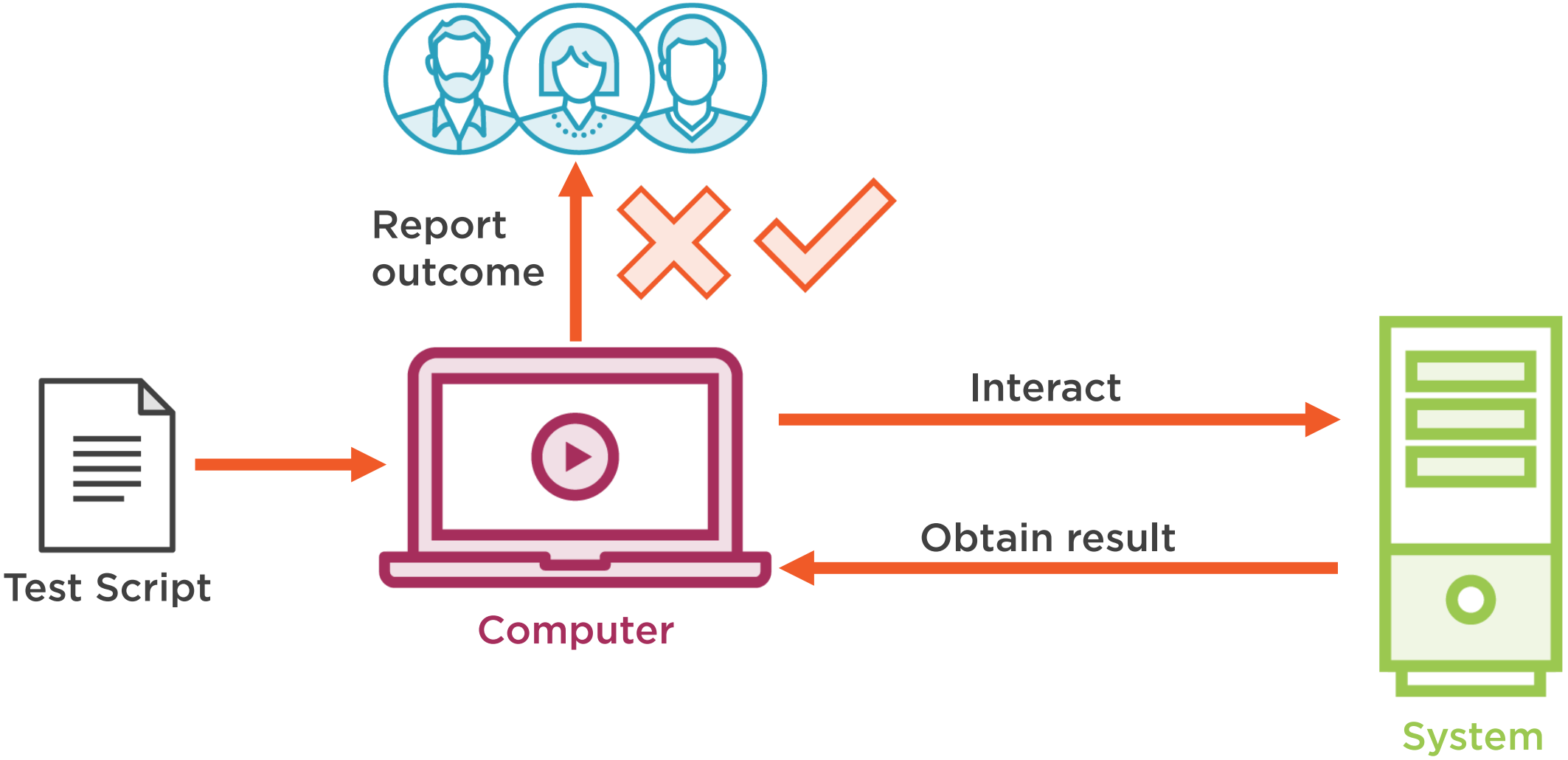

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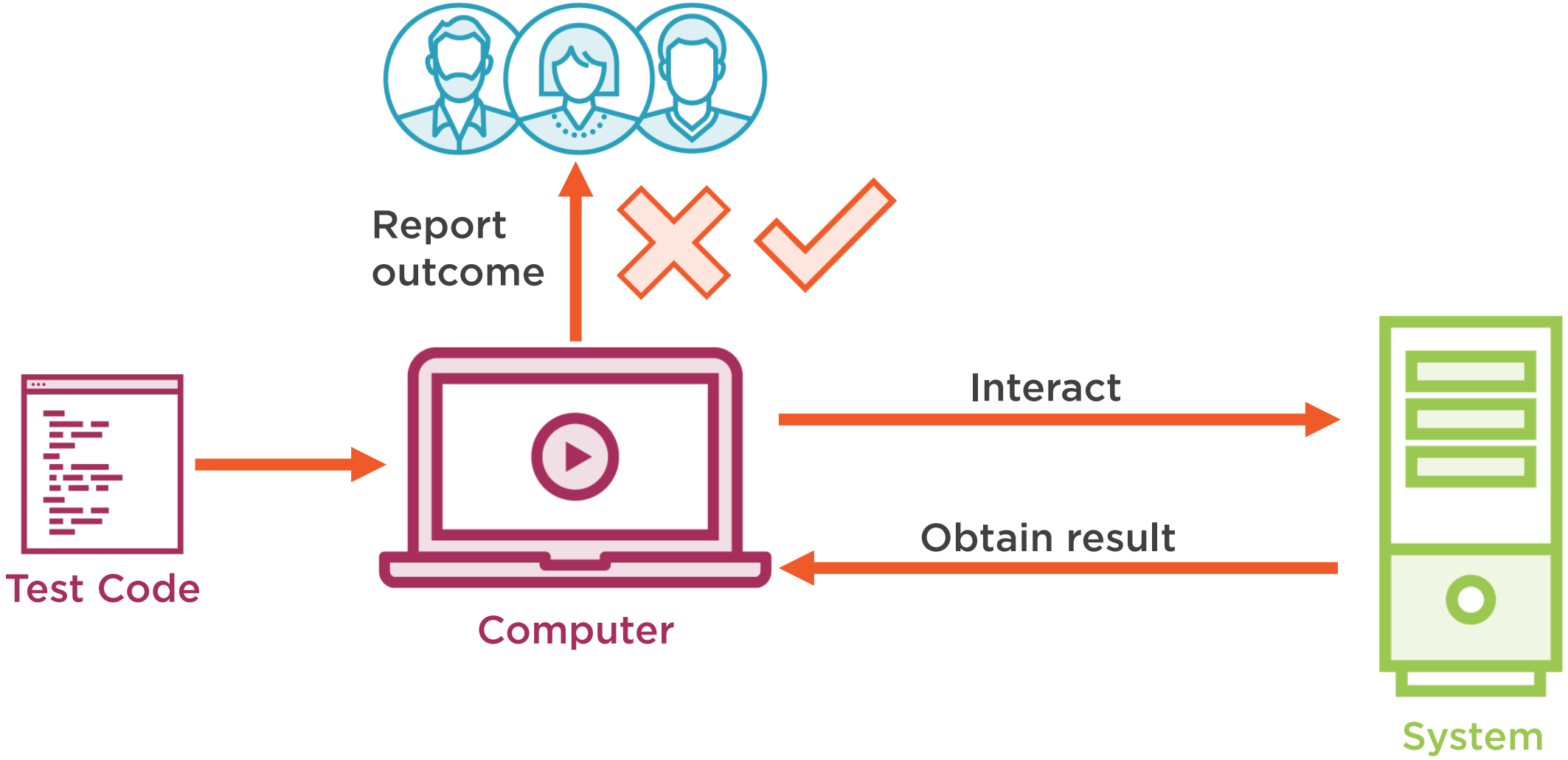


High Level Benefits

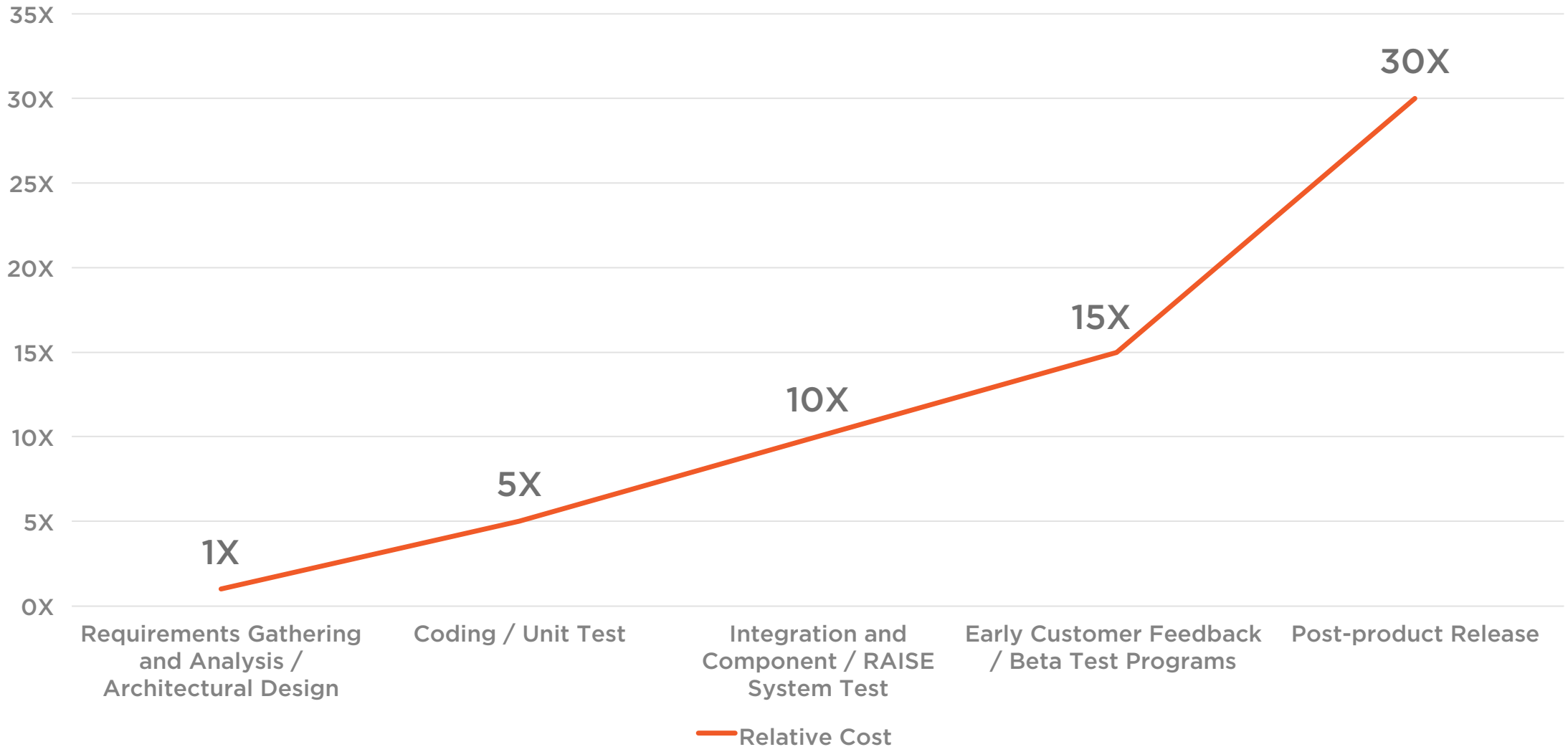
Automated Tests	Manual Human Tests
Free to run as often as required	Cost every test run (staff)
Run at any time	Limited to staffed hours
Quicker	Slower
Generally less error prone	Potentially more error prone
Automated test code in source control	Manual test scripts in external system
Creation and maintenance costs	Creation and maintenance costs

“Minimizing defects is one of the most effective ways to keep development costs down…”

Kari Ann Briski *et al.*

ftp://ftp.software.ibm.com/software/rational/info/do-more/RAW14109USEN.pdf

Relative Cost to Repair Defects When Found at Different Stages of Software Development (Example Only)



Source: The Economic Impacts of Inadequate Infrastructure for Software Testing [National Institute of Standards and Technology] https://www.nist.gov/sites/default/files/documents/director/planning/report02-3.pdf

The Cost of Fixing Software Defects

Requirements Gathering	$ 100
Coding / Unit Test	$ 500
Integration and Component	$1,000
Early Customer Feedback / Beta	$1,500
Post-product Release	$3,000

Phase	Cost per Defect ($)	Defects Found	Cost ($)
Requirements Gathering	100	1	100
Coding / Unit Test	500	5	2,500
Integration and Component	1,000	3	3,000
Early Customer Feedback / Beta	1,500	10	15,000
Post-product Release	3,000	30	90,000
		49	110,600

Scenario 1

Poor testing strategy

Defects found later

Total cost: $ 110,600

Phase	Cost per Defect ($)	Defects Found	Cost ($)
Requirements Gathering	100	1	100
Coding / Unit Test	500	25	12,500
Integration and Component	1,000	3	3,000
Early Customer Feedback / Beta	1,500	10	15,000
Post-product Release	3,000	10	30,000
		49	60,600

Scenario 2

Better testing strategy

Defects found earlier

Total cost: $ 60,600

Defect detection cost savings: $ 50,000

Coding / Unit Test Time

Unit test fails in development

Developer reviews specific failure message

Developer fixes code

Test now passes

Post-production Release

Error occurs in production

Automated monitoring / end-user

Production bug logged / ticket created

Developer accesses production logs

Developer traces through logs

Probable defect located

Reproduce in development environment

Implement fix in development

Test in development

Plan bug-fix production release

Release to production (outage?)

Check fix works in production

The Happiness Factor

Happier end-users

- Accomplish more tasks / fewer problems

Happier development team

- Less time fixing production defects
- More time developing new features
- Increased confidence to make changes
- Increased system understanding
- Less unnecessary stress

Happier business owners

- Reduced costs / increased revenues
- Improved business reputation / reliability
- Reduced staff turnover

Automated Testing in Context

Code reviews

Pair programming

Good management

Motivated development team

Well-understood requirements

Good environment configuration / DevOps

Considerations

Developer training costs

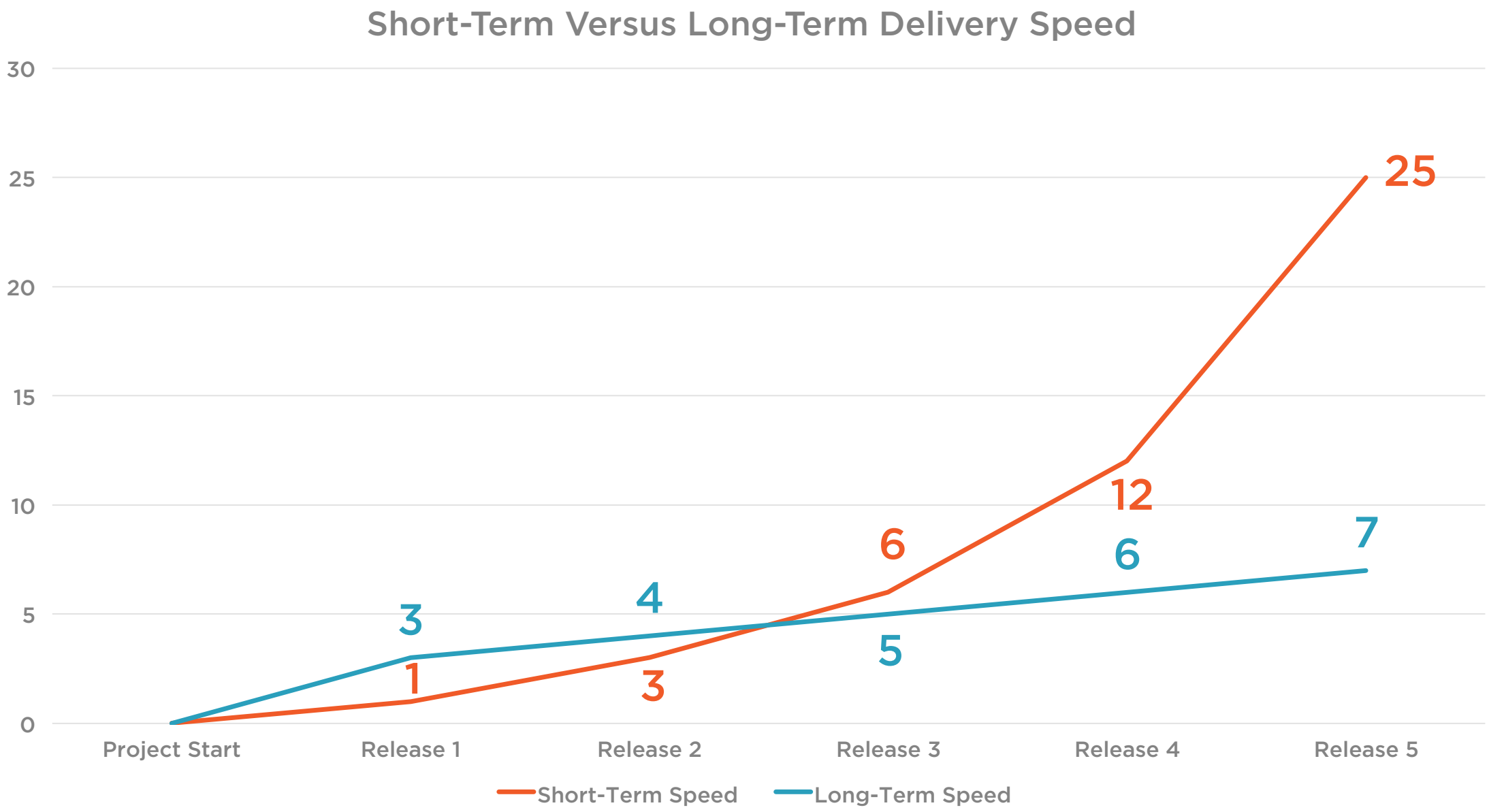
New hardware

OS license costs

Non open source license costs

Initial reduced productivity

Time to market?


Short-Term Versus Long-Term Delivery Speed
30
25
20
15
10
5
0
Project Start
Release 1
Release 2
Release 3
Release 4
Release 5
1
3
6
12
25
3
4
5
6
7
Short-Term Speed
Long-Term Speed

Summary

What is automated testing?

High level benefits

- Quick to execute
- Free to execute

Considering the cost of ownership

Happier end-users, team, and business

Automated testing in the wider context

- Code reviews
- Well-understood requirements

Considerations

- Training, hardware, licence costs
- Time to market

Short versus long-term delivery speed

Next:

Understanding the Different Types of Automated Tests