The Pathologies of failed Test Automation Projects

Michael Stahl, Intel
Apr 2013

Based, in part, on work done with Alon Linetzki, Best Testing (www.best-testing.com)

On the Menu…

- Automation failure patterns
- What can we do?
- Summary

Based, in part, on work done with Alon Linetzki, Best Testing (www.best-testing.com)

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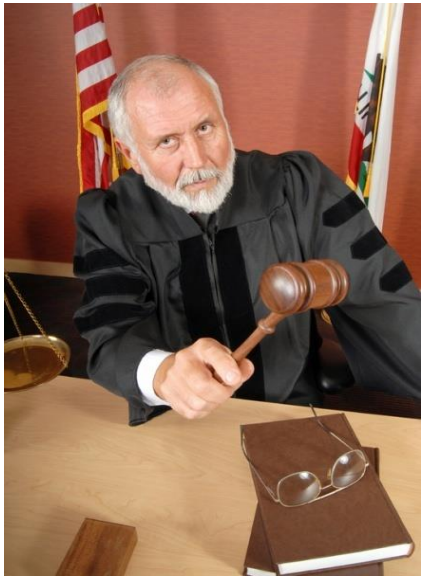

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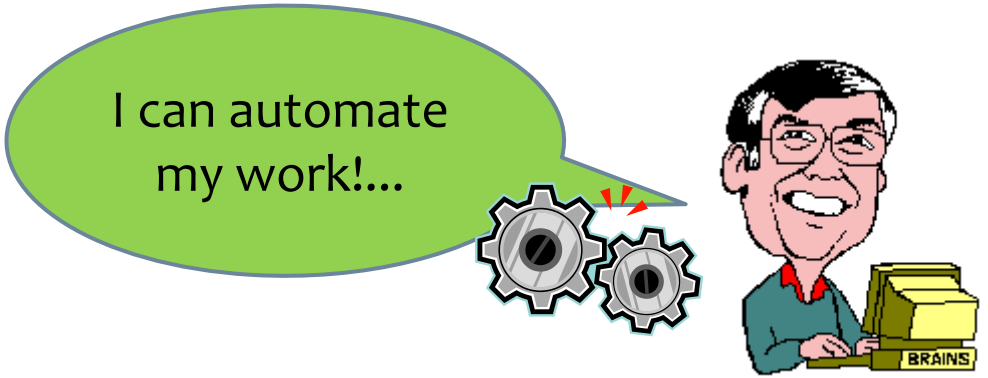
A common automation story…

- Once upon a time…



Mr. Otto Mate

Otto's Team

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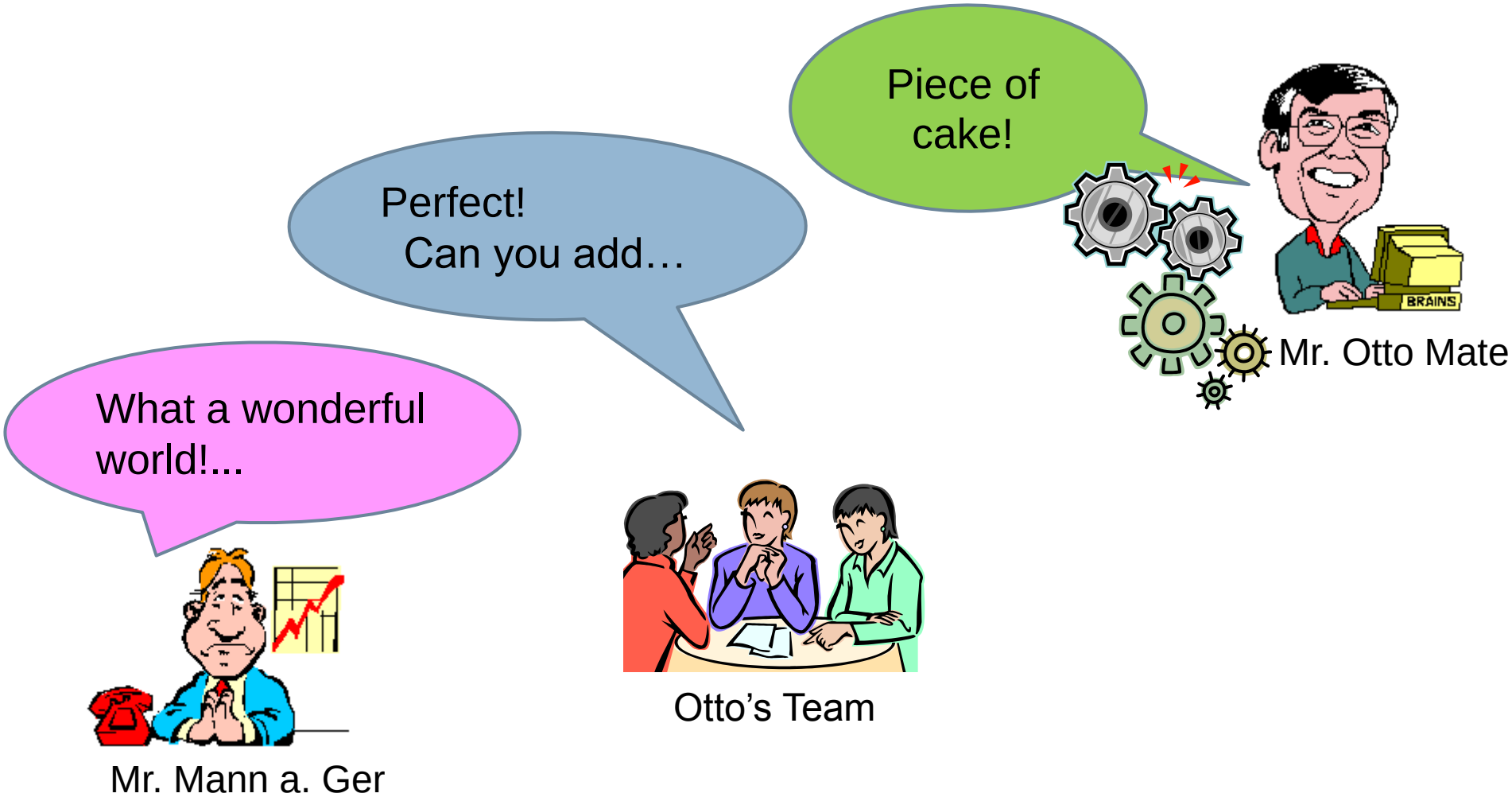
A common automation story…



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A common automation story…

Otto's Team

Otto! The last release fails!...

Argggghhh! Fix Fix Fix

Mr. Otto Mate … and mates

Sir! I need time! I need help!

Makes sense…

Mr. Mann a. Ger

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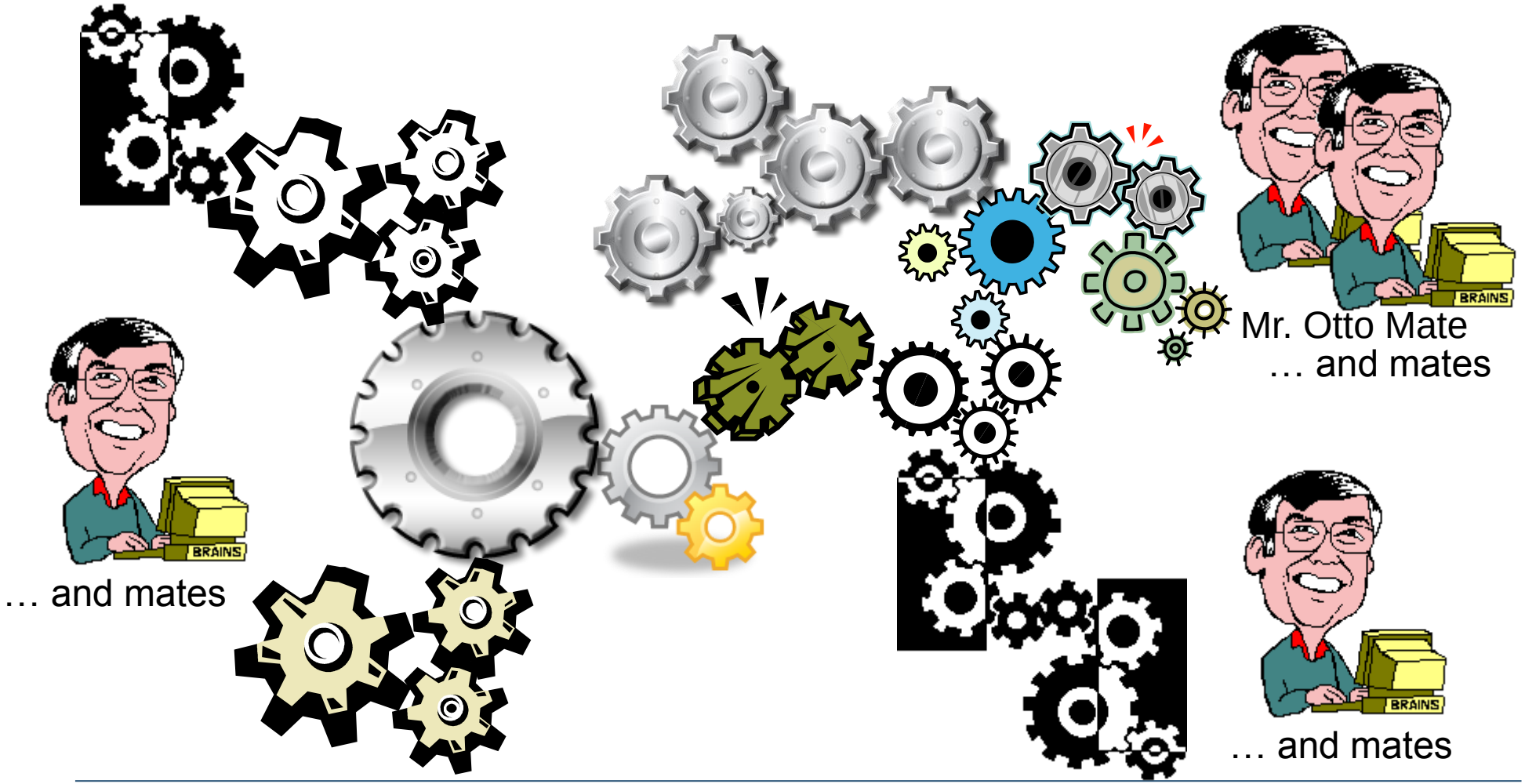
A common automation story…



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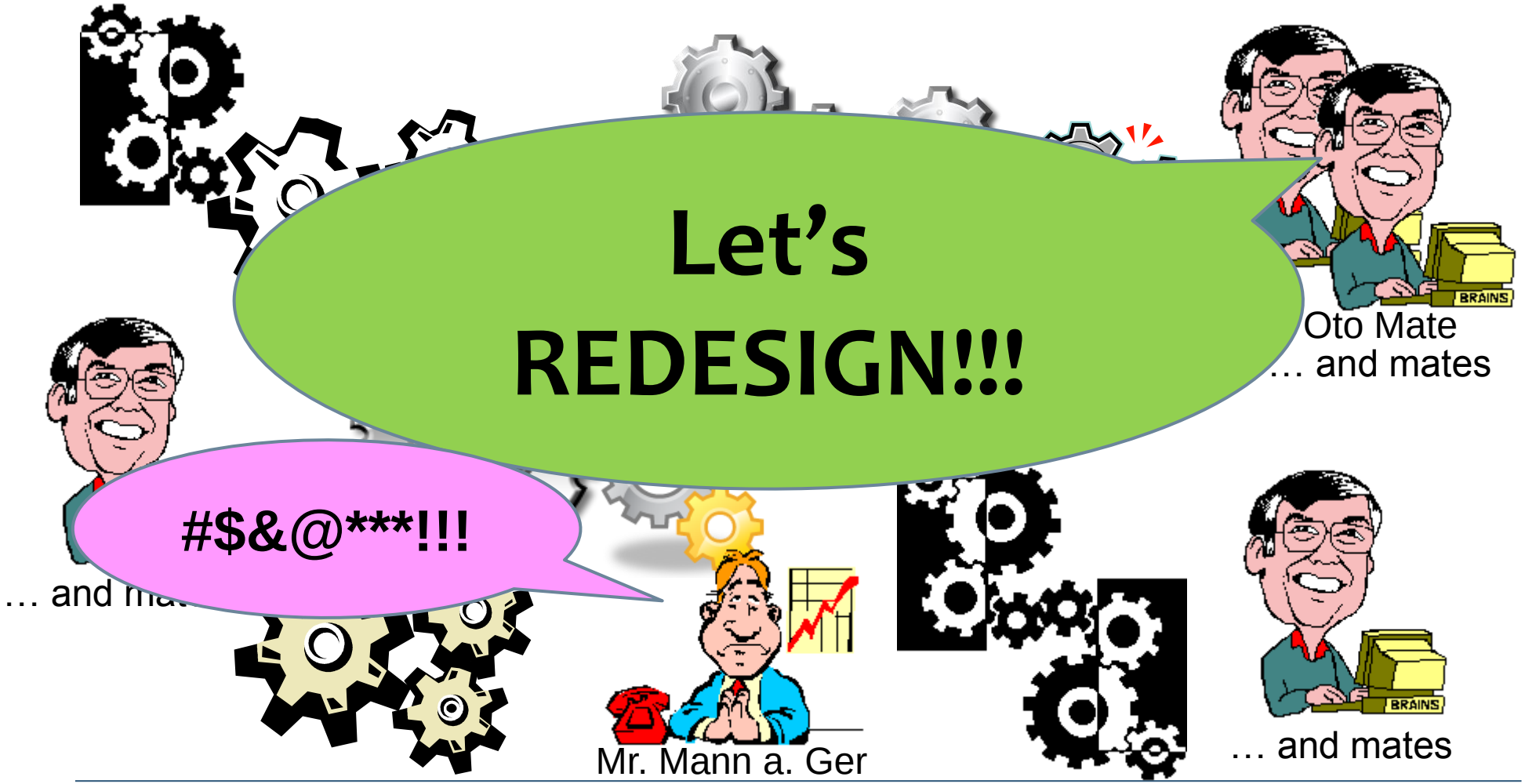
A common automation story…



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A pattern emerges…

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Pattern #1: Mushrooming

A pattern…

Single User / Developer

Simple Tool

Stage 1 – Small & Local

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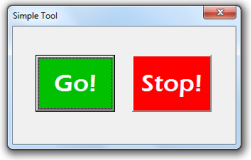
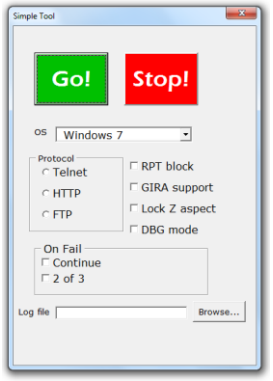
A pattern…

Multiple Users / Single Developer





Enhanced Tool

Stage 2 – Generalization

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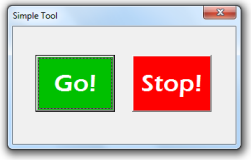
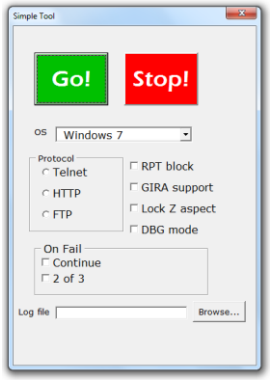
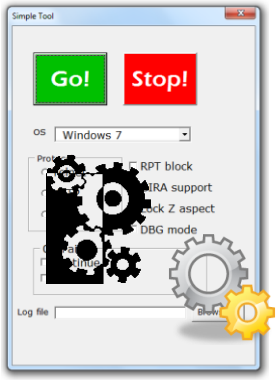
A pattern…

Multiple Users & Developers







Complicated Tool

Stage 3 – Staffing

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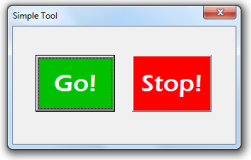
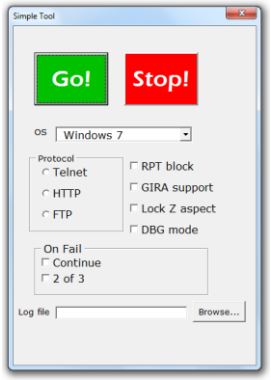
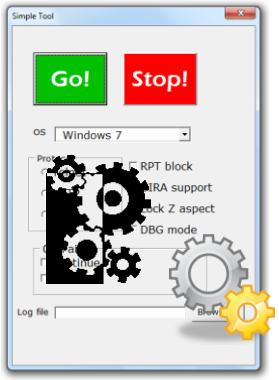
A pattern…

Multiple Users & Developers







Test Case Management

Stage 4 – Non-core features

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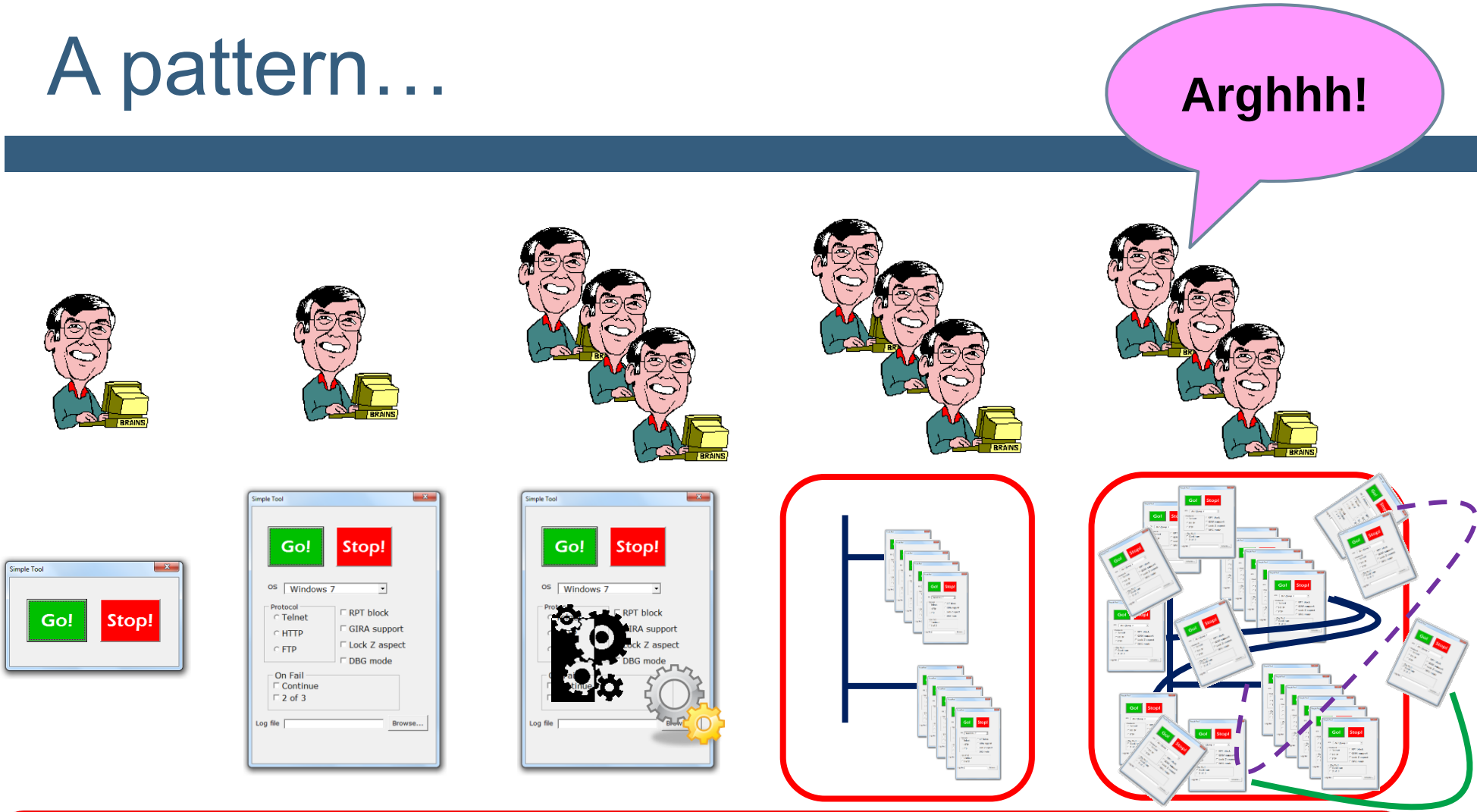
A pattern…



Stage 5 – Overload

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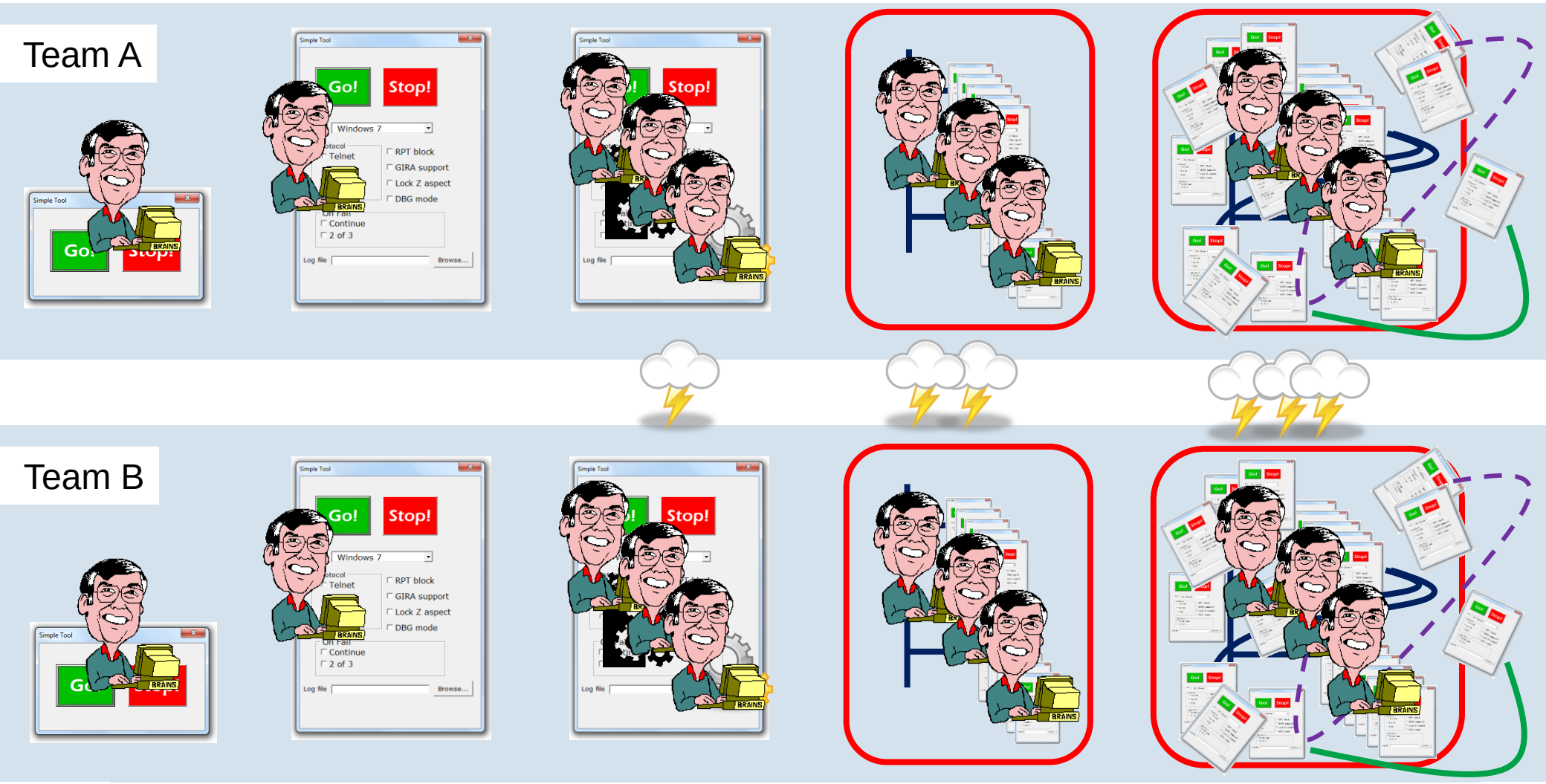
Pattern #2:
The Competition

Pattern #2 – The Competition (ver. 1)



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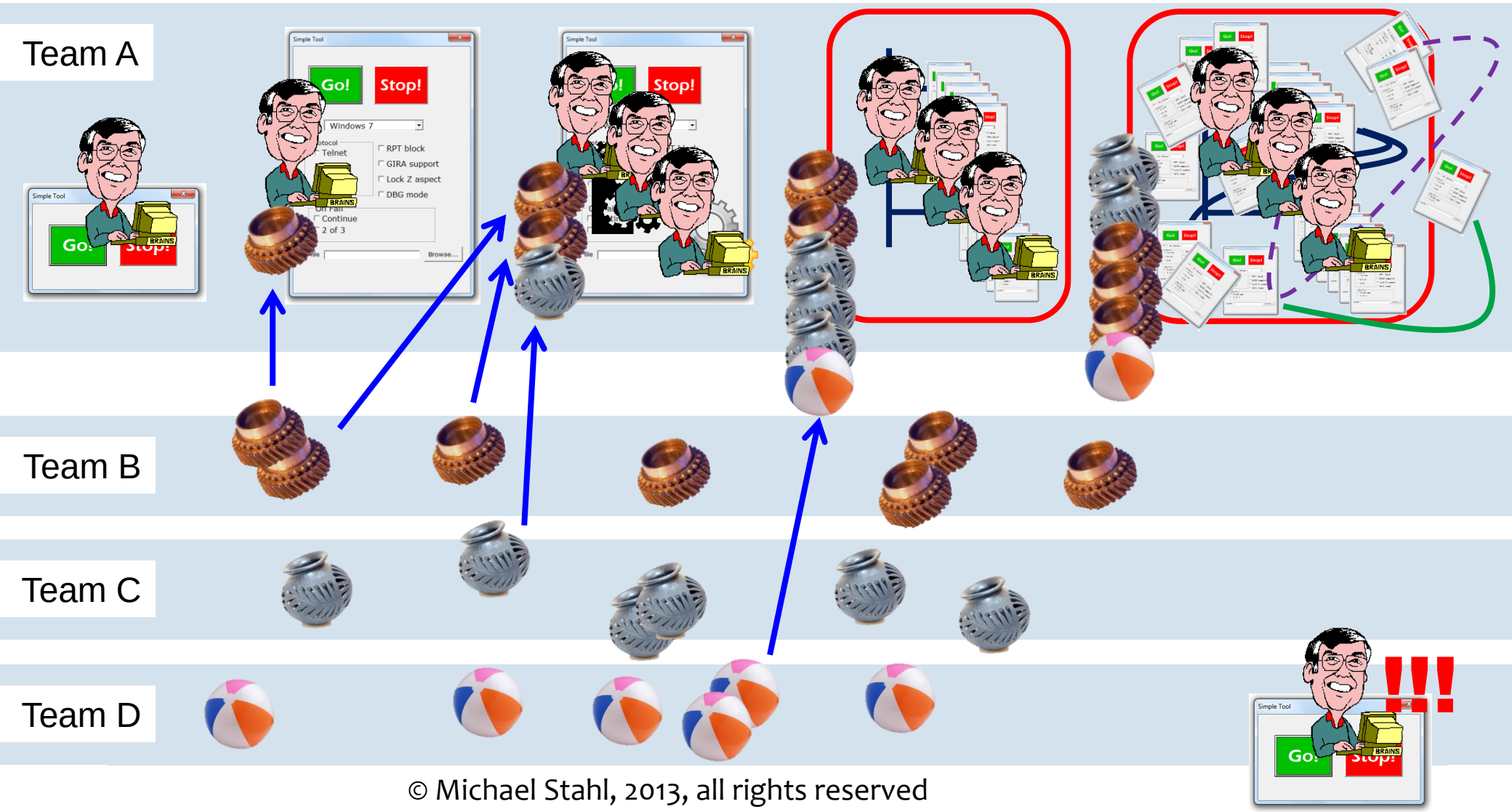
Pattern #2 – The Competition (ver. 2)



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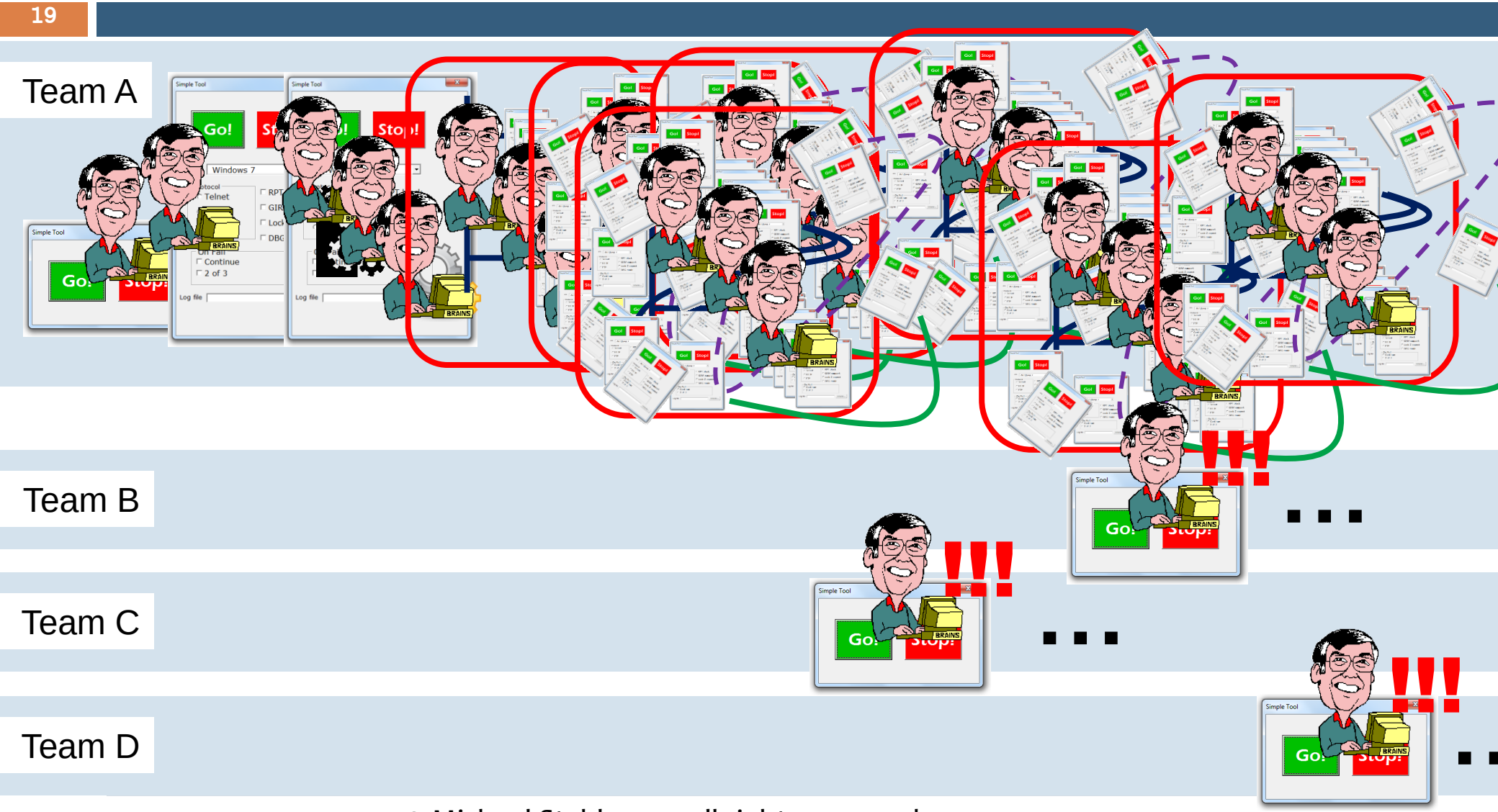
Pattern #2 – The Competition (ver. 3)



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Pattern #3: The Night Run Fallacy

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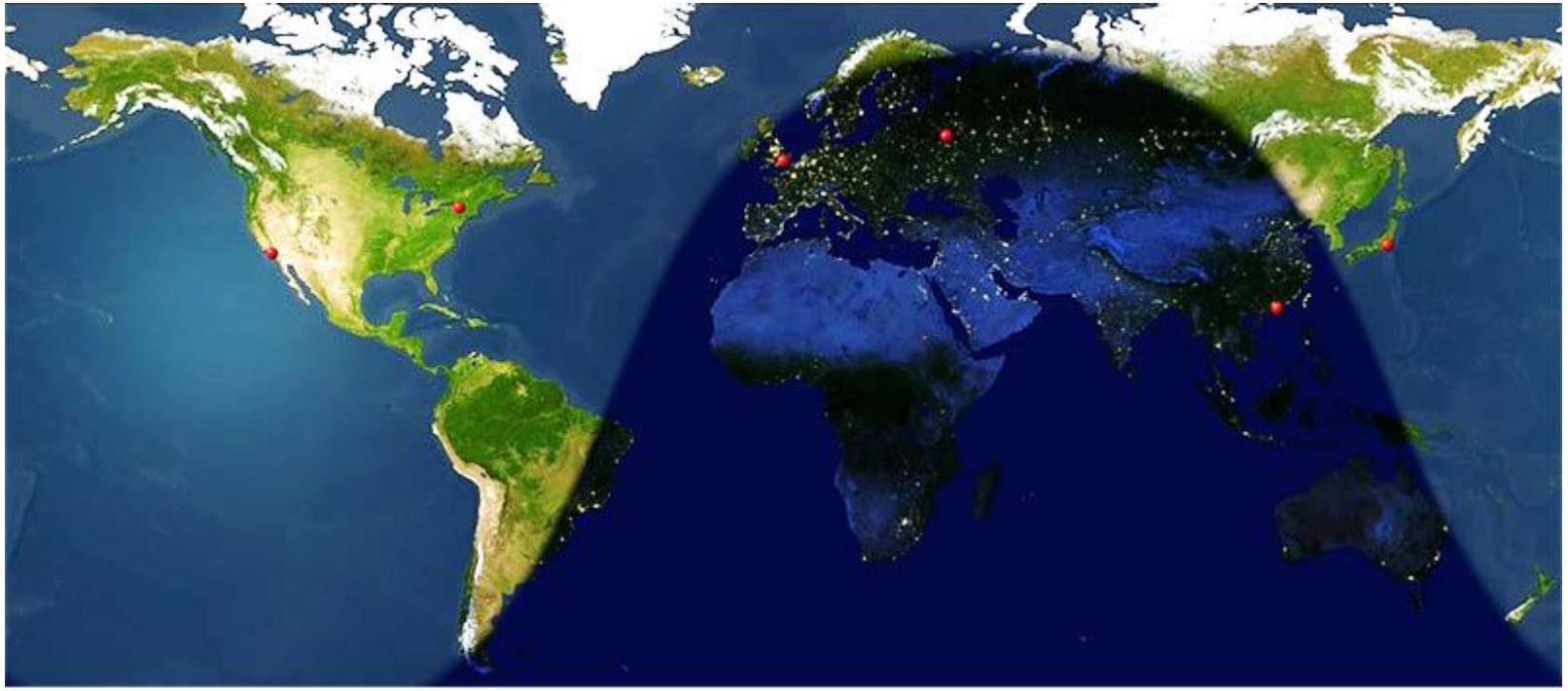
Pattern #3 – The Night Run Fallacy



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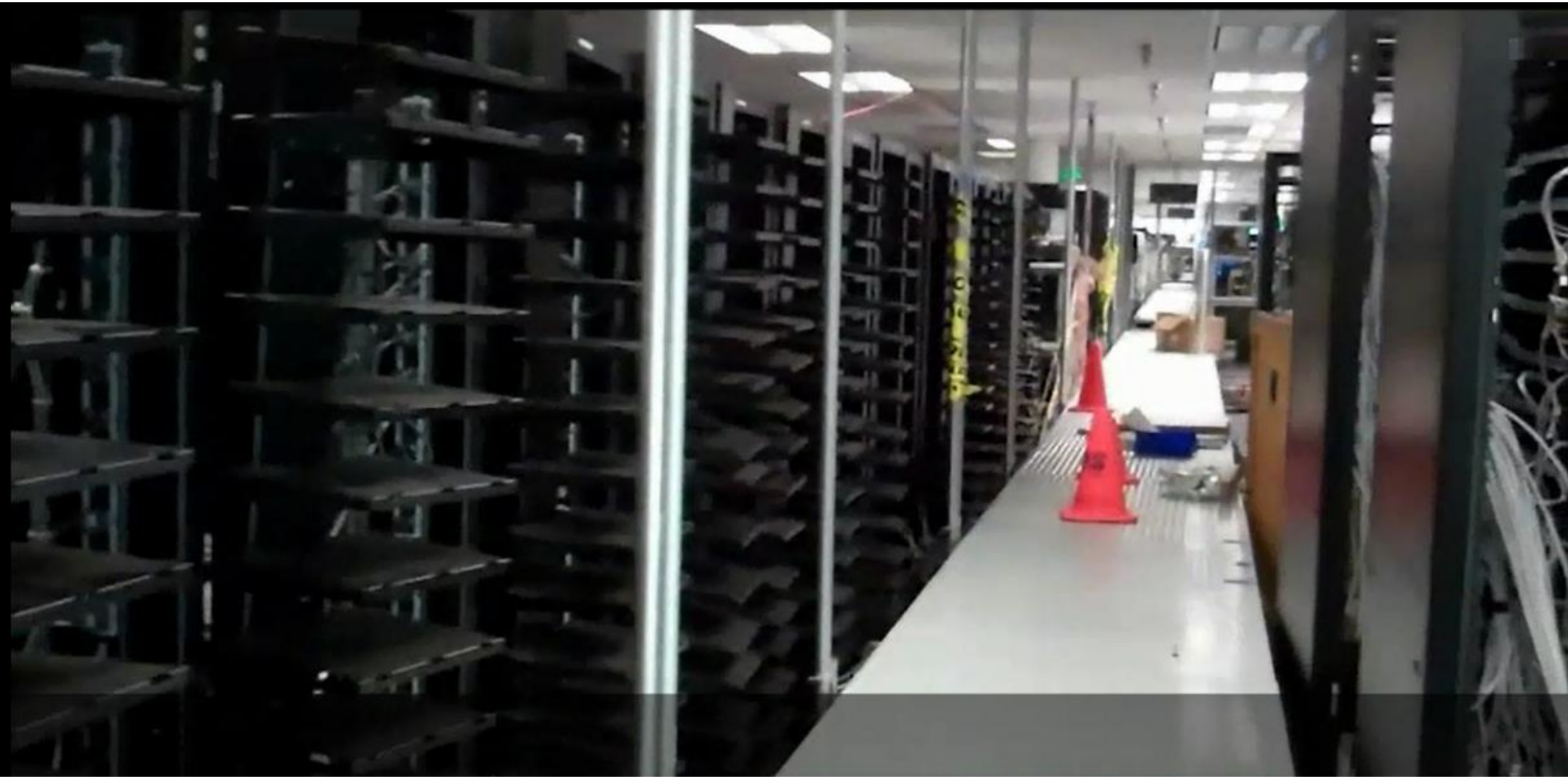
Pattern #3 – The Night Run Fallacy

Corporate Truism:
It’s easier to get budget for machines than for more testers

Pattern #3 – The Night Run Fallacy



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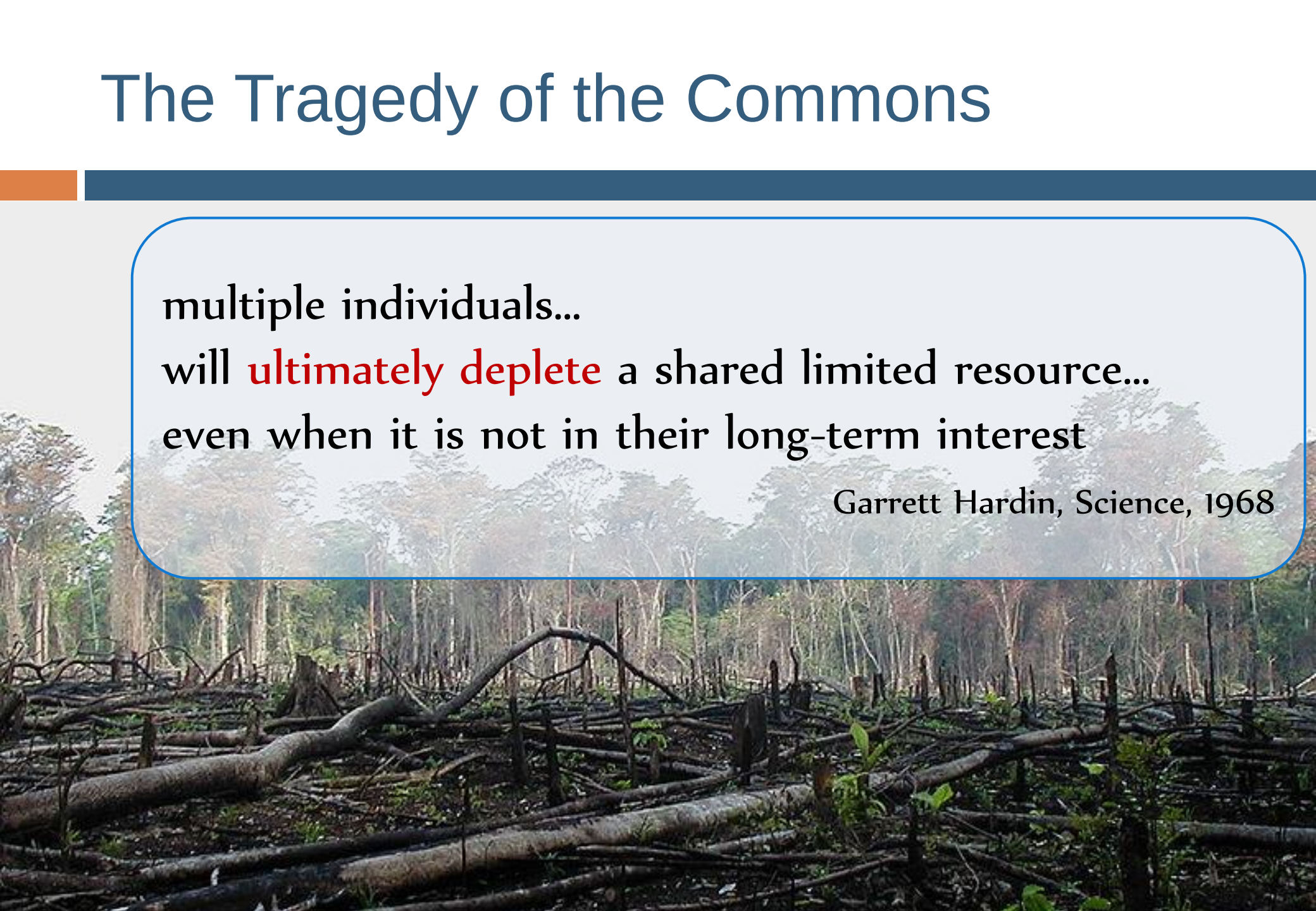
Pattern #3 – The Night Run Fallacy

Test Automation Truism:
Machines create work for more testers

The Tragedy of the Commons

multiple individuals…
will ultimately deplete a shared limited resource…
even when it is not in their long-term interest

Garrett Hardin, Science, 1968



Pattern #4:
Going for the Numbers

GOing for the numbers.docx - Microsoft Word

File Home Insert Page Layout References Mailings Review View Add-Ins Acrobat

Monthly status report
May 2012

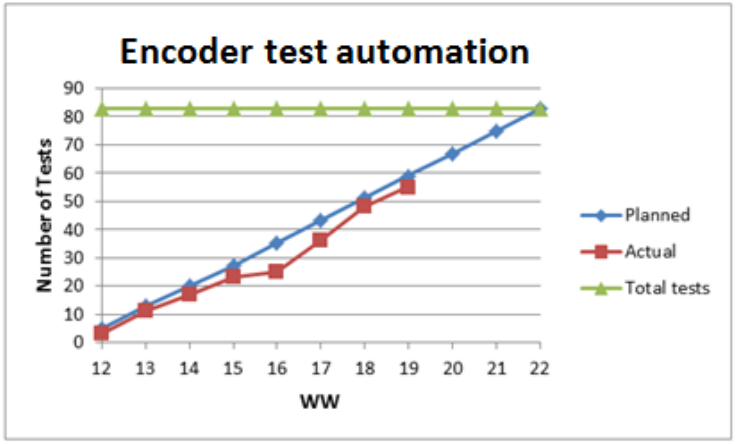
Summary

- Productivity
  - 70 Encoder tests automated
- ...

Details

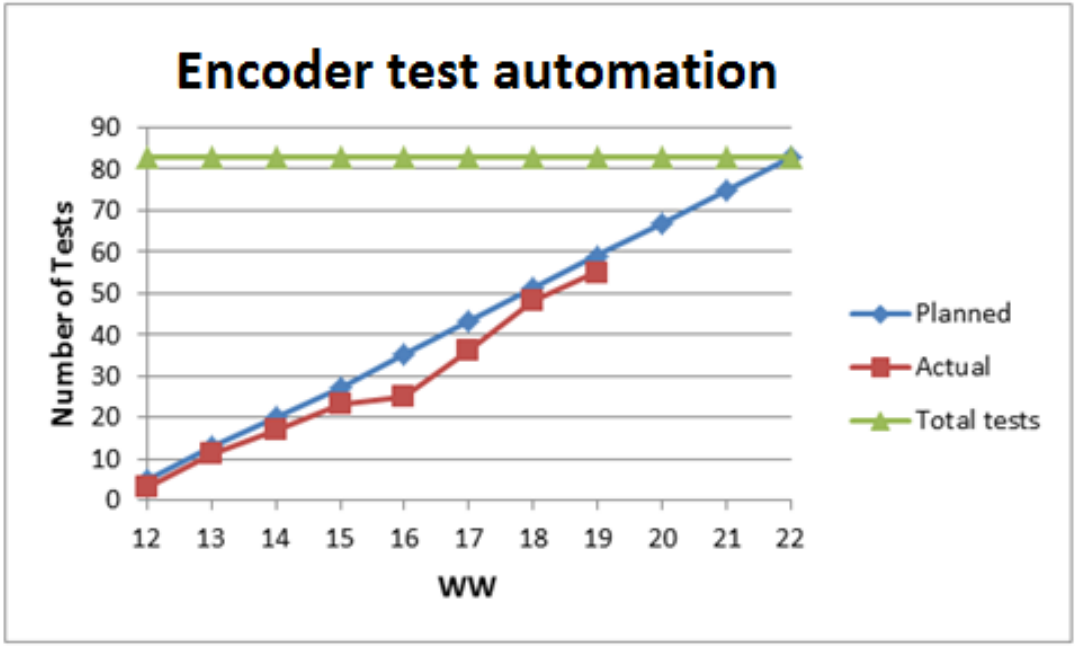
Productivity/Process Enhancements:

- Encoder Test automation
  - Continued progress:



Pattern #5 – Going for the Numbers

- Encoder Test automation
  - Continued progress:



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Pattern #4 – Going for the Numbers

Robustness is Invisible

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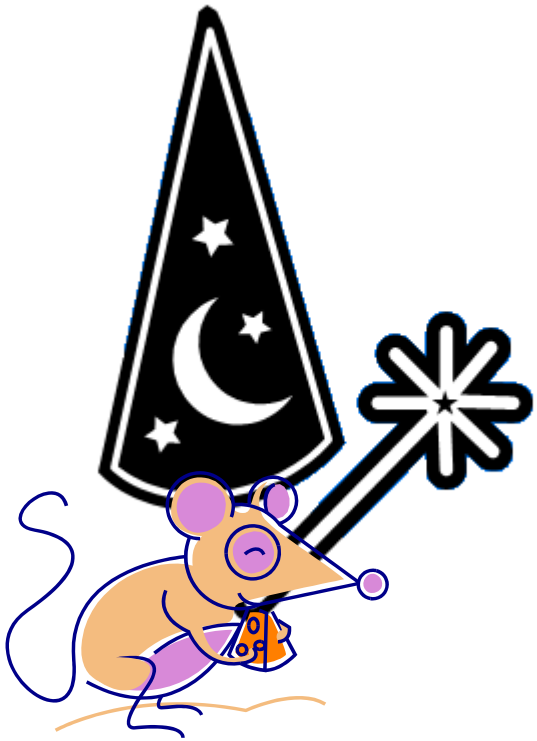
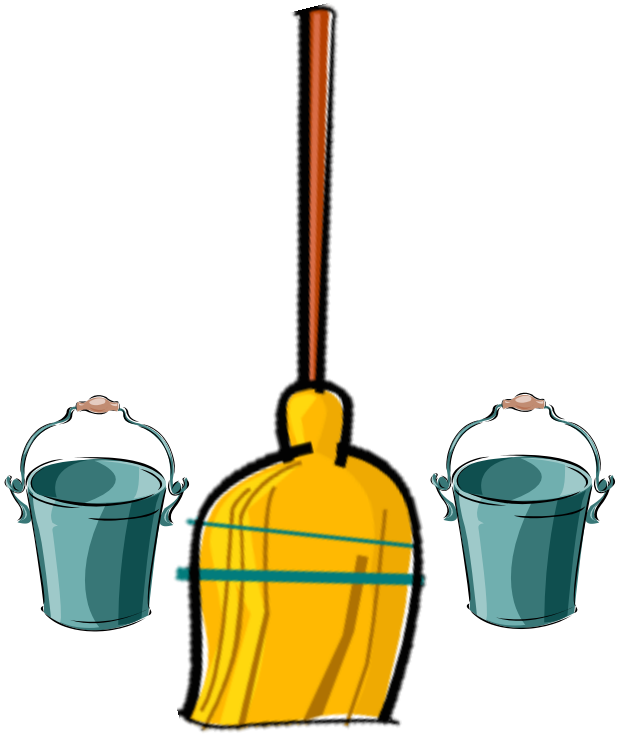
Pattern #5:
The Magician Apprentice Syndrome

Pattern# 5 – The Magician Apprentice





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Recap: The Patterns

Mushrooming

The Competition

The Night time Fallacy

Going for the Numbers

The Magician Apprentice

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So...

What can we do?

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Are the patterns…

Unavoidable?

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Counter measures

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Mushrooming

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Alert Signals & Counter Measures

How to use this information?

- GPS
  - Locate the stage you are at
  - Get directions for the way out

- Map
  - Start right and avoid the wrong turns

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Alert Signals

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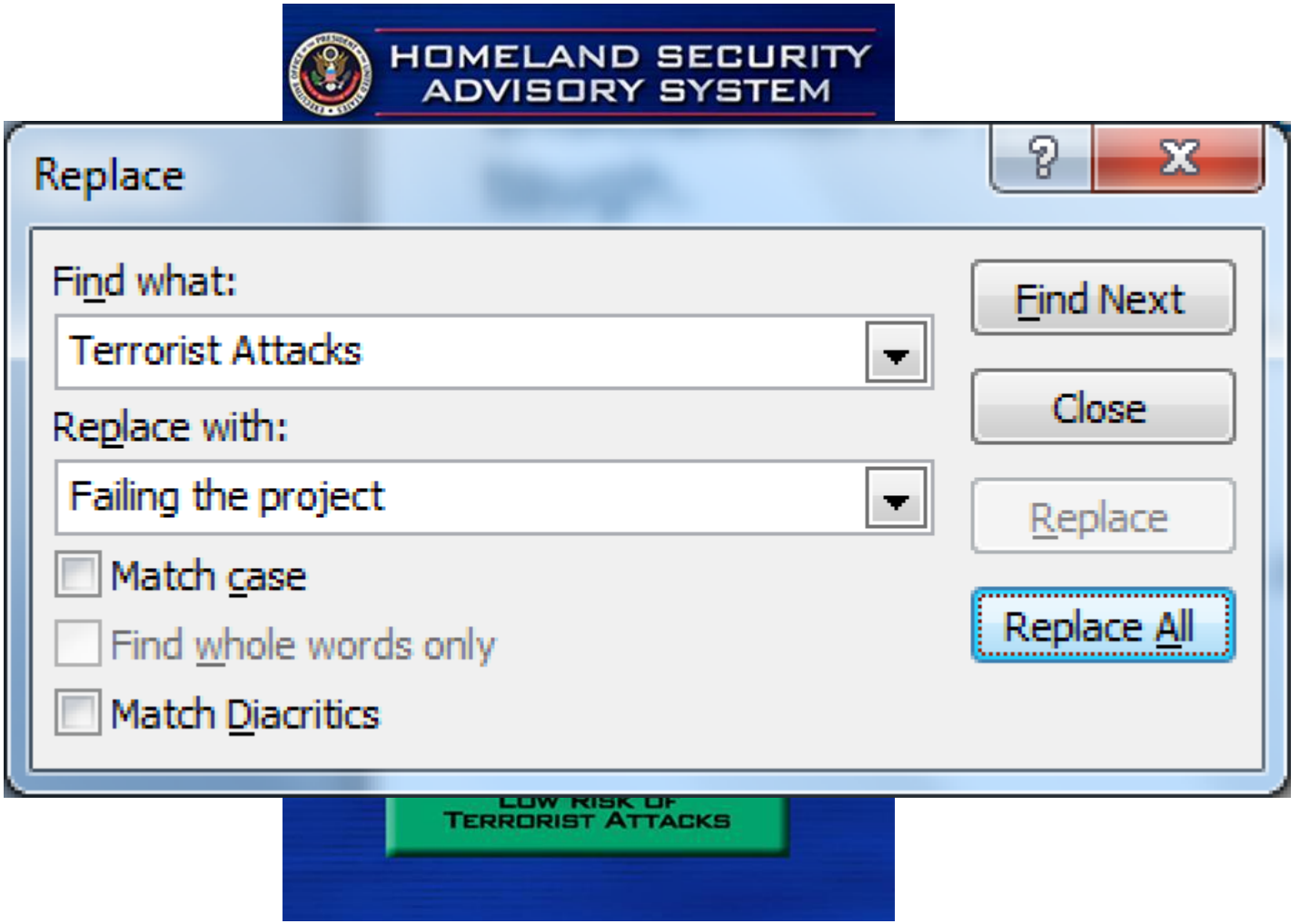
Alert Signals



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Alert Signals

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Alert Signals: Stage 1

Small, local, feature-centered

- ☑ Single feature test tool?
- ☑ The creator is the user?
- ☑ "Skunk works"?
- ☑ Key words:
  - ☑ "Tool"
  - ☑ "Utility"

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Counter Measures: Stage 1

Small, local, feature-centered

Ensure the following… and relax:

- ☑ Code control
- ☑ Documentation
  - User Manual (Usage line…)
  - "Green" in the code
  - High level design

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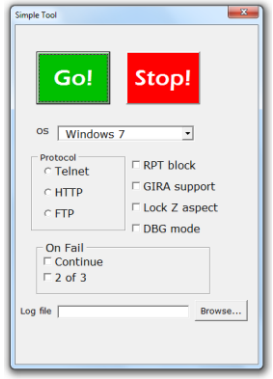
Alert Signals: Stage 2

Generalization

- ☑ Additional features?
- ☑ Multiple users?
- ☑ Automation web site?
- ☑ >25% of the tester's time?
- ☑ Key words:
  - ☑ "Use by other testers"
  - ☑ "Common Libraries"



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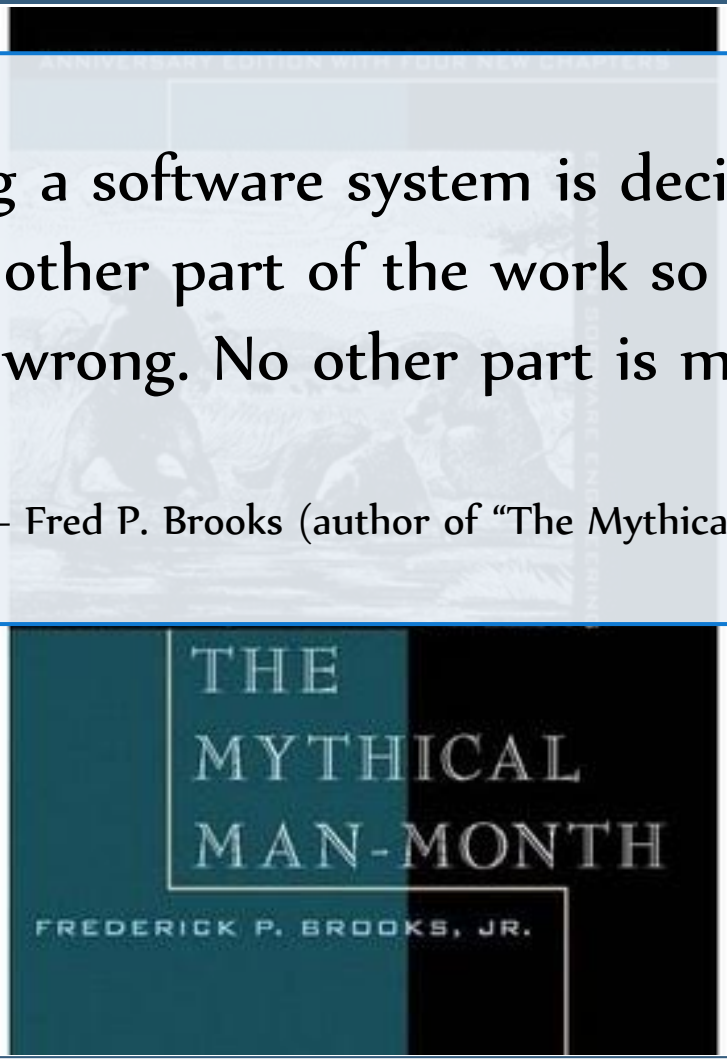
Counter Measures: Stage 2

Generalization

"The hardest part of building a software system is deciding precisely what to build… No other part of the work so cripples the resulting system if done wrong. No other part is more difficult to rectify later"

- Fred P. Brooks (author of "The Mythical Man-Month")



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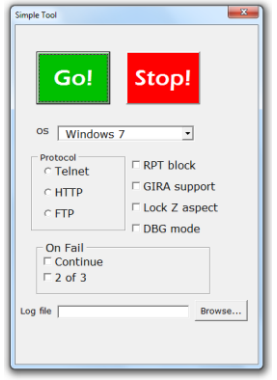
Counter Measures: Stage 2

Generalization

- ☑ Stage 1 measures
- ☑ Strategy
- ☑ Architecture
- ☑ Lightweight PM
  - Version control
  - Scope control
  - Bugs & Requests database



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Alert Signals: Stage 3

Institutionalization and staffing

- ☑ Requests for additional heads?
- ☑ Automation F2F?
- ☑ Tool-related delays in execution?
- ☑ Key words:
  - ☑ "Tool Owner"; "Automation team"
  - ☑ "Framework"; "Infrastructure"
  - ☑ "Roll back"
  - ☑ "Bug fix release"

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STOP

Counter Measures: Stage 3

Institutionalization and staffing

- ☑ Stage 1, 2 counter measures
- ☑ Management level decision time
  - ☑ Programming language
  - ☑ Framework focus
- ☑ Code and release management
- ☑ Acceptance tests
- ☑ Skillset development
- ☑ Metrics

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Counter Measures: Stage 3

Institutionalization and staffing

Metrics suggestions

- ☑ Automation framework quality
  - ☑ Number of false fails
  - ☑ Framework's test results; Bug trends
- ☑ ROI
  - ☑ Number of runs
  - ☑ Invested effort by type (new, maintenance, rewrite)
  - ☑ Number of bugs found by Automation (?)

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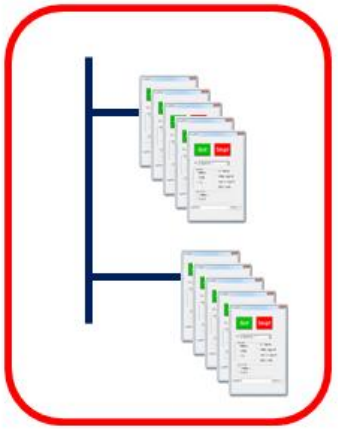
Alert Signals: Stage 4

Change of focus: Technology ⇨ Management

- ☑ Generic features?
- ☑ Test log wading?
- ☑ False fails?
- ☑ Key words:
  - ☑ “test suite / cycle generation”
  - ☑ “robustness enhancement”
  - ☑ “setup issues”



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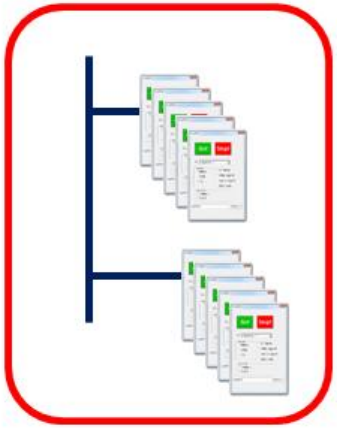
Counter Measures: Stage 4

Change of focus: Technology ⇨ Management

- ☑ Stage 1, 2, 3 counter measures
- ☑ Build VS Buy
- ☑ Re-architect
  - ☑ Core / Non-Core
  - ☑ Solid infrastructure
- ☑ Influence upstream
  - ☑ Testability hooks
  - ☑ Design for Test (automation)



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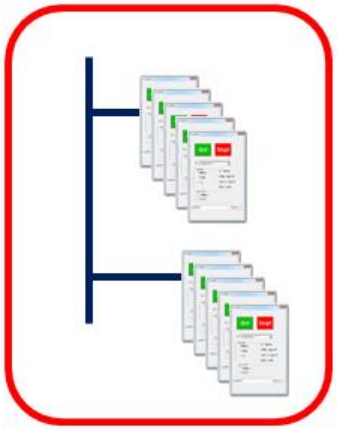
Counter Measures: Stage 4



- ☑ Build VS Buy?

(hint: Buy)

See: http://www.stickyminds.com/s.asp?F=S17601_COL_2

Stage 4 – Non-core features

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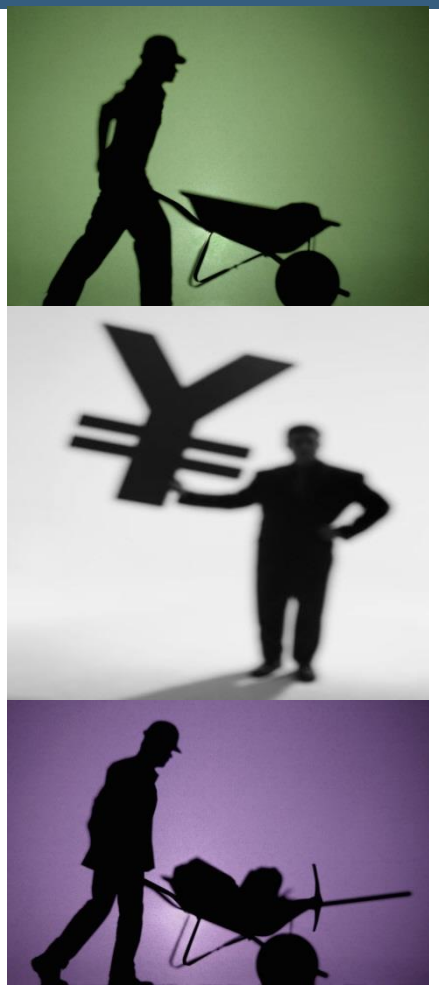
Counter Measures: Stage 4

Change of focus: Technology ⇨ Management

Build (VS Buy) if…

- ☑ Competitive edge
- ☑ Existing expertize
- ☑ Core competency
- ☑ Cheaper; Faster
- ☑ Good use of resources
- ☑ Acceptable risk
- ☑ Long term support



Main source: Allen Eskelin
http://www.informit.com/articles/article.aspx?p=21775

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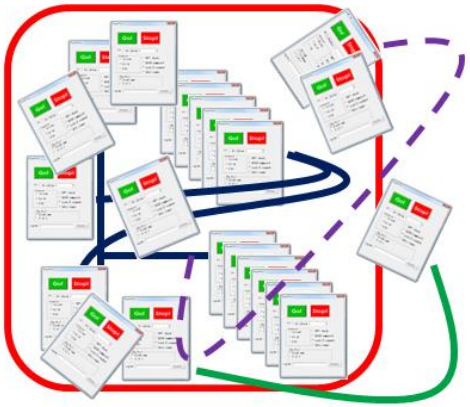
Alert Signals: Stage 5

Maintenance overload; Re-design

- ☑ Maintenance & logistics overload?
- ☑ Limitations overplay?
- ☑ Loss of credibility?
- ☑ Stage 1 initiatives?
- ☑ Key words
  - ☑ "Did it fail in manual test?"
  - ☑ "Architecture limitation"
  - ☑ "refactoring"; "redesign"
  - ☑ "…I can write a small program…"



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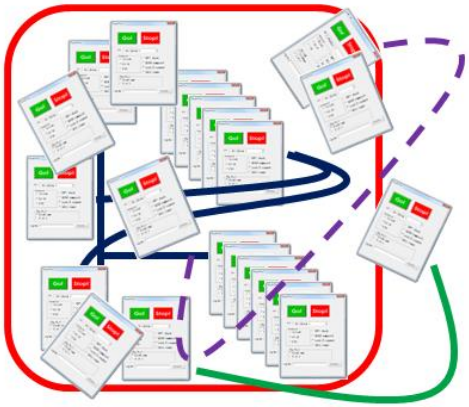
Alert Signals: Stage 5

Maintenance overload; Re-design

Loss of credibility

Pre-check-in tests.docx



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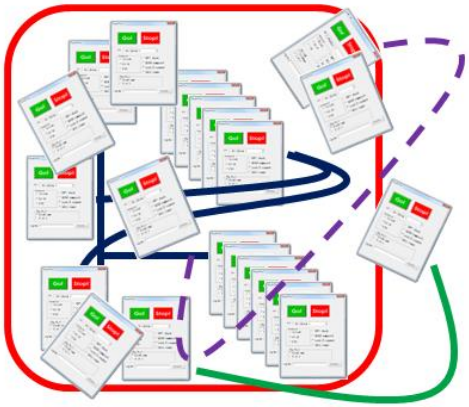
Counter Measures: Stage 5

Maintenance overload; Re-design

Options:

- ☑ Continue… ☹
- ☑ Give up problematic areas
- ☑ Partial return to Stage 1
- ☑ "We value Robustness over New Features"
- ☑ Prepare for re-design – with a new map…



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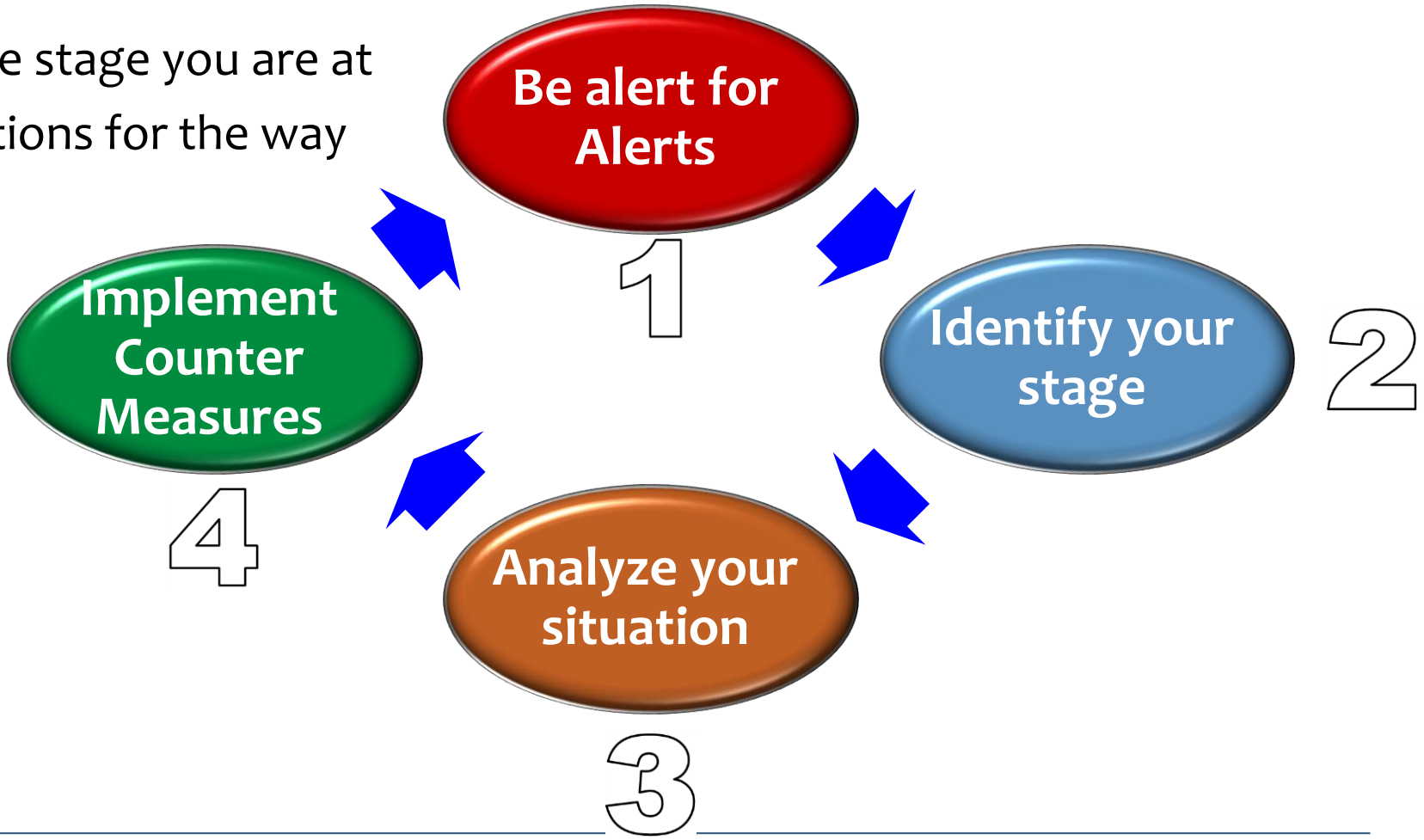
How to Use this information?

- **GPS**
  - Locate the stage you are at
  - Get directions for the way out



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How to Use this information?

- **Map**
  - Start right and avoid the wrong turns

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The Competition

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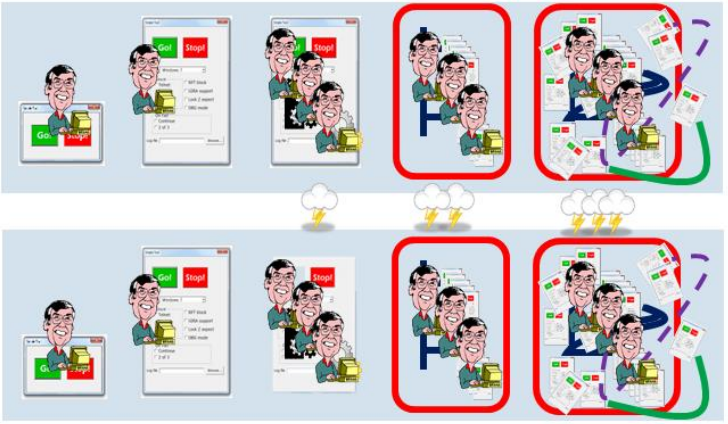
Pattern #2 – The Competition (ver. 1)

- ☑ Salvageable up to stage 2
- ☑ Stage 3 and up:
  - Merge the teams
  - EOL both tools
  - Start a 3rd



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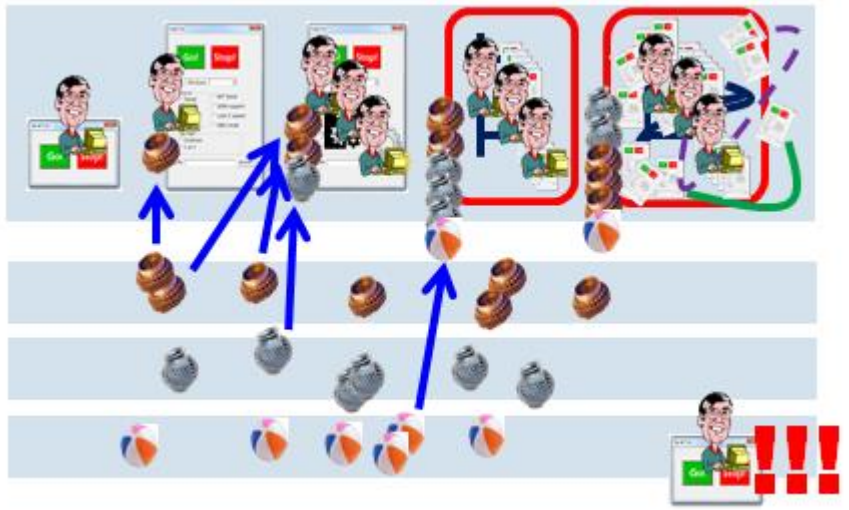
Pattern #2 – The Competition (ver. 2)

- ☑ Plugin Architecture



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Pattern #2 – The Competition (ver. 3)

- ☑ Fix the main problem
- ☑ Accept, encourage Stage 1 stuff…
- ☑ Maintaining vigil:
  - Avoid ver.1 pattern

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The Night Run Fallacy

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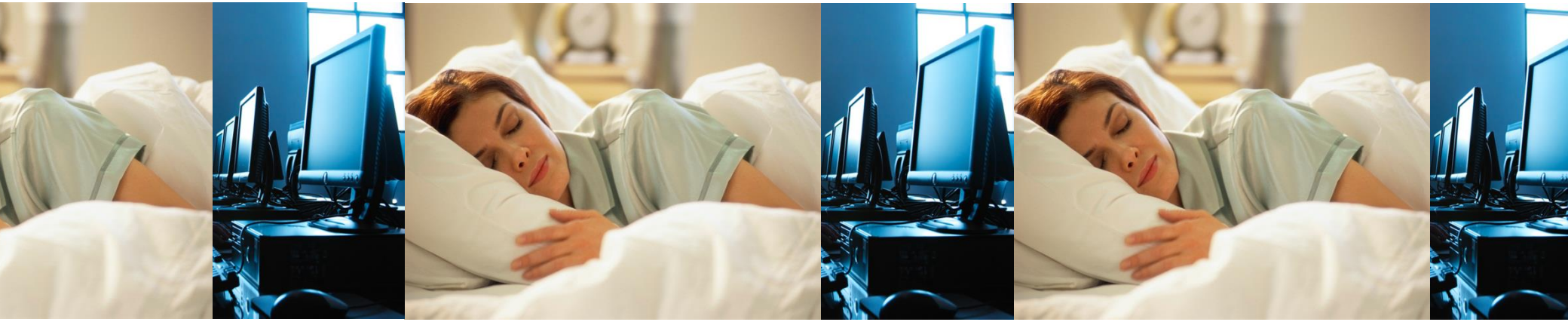
Pattern #3 – The Night Run Fallacy



- ☑ Never forget test time, test efficiency
- ☑ Balance test skills VS automation skills
- ☑ Allocate machines or machine time

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Going for the Numbers

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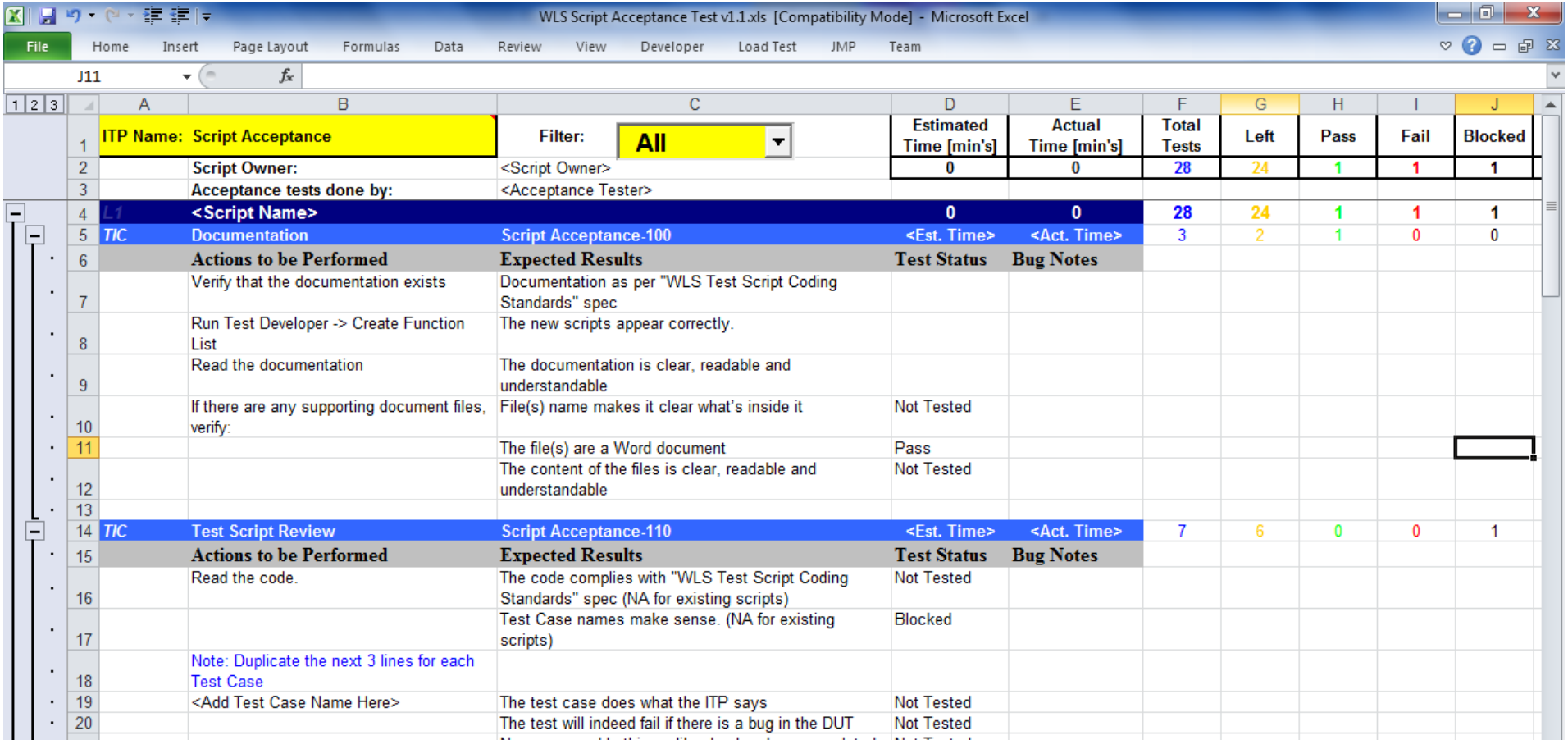
Pattern #4 – Going for the Numbers

- ☑ Change how you count "Done"



WLS Script Acceptance Test v1.1.xls [Compatibility Mode] - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View Developer Load Test JMP Team

J11

	A	B	C	D	E	F	G	H	I	J
1	ITP Name:	Script Acceptance	Filter: All	Estimated Time [min's]	Actual Time [min's]	Total Tests	Left	Pass	Fail	Blocked
2		Script Owner:	<Script Owner>	0	0	28	24	1	1	1
3		Acceptance tests done by:	<Acceptance Tester>							
4	L1	<Script Name>		0	0	28	24	1	1	1
5	TIC	Documentation	Script Acceptance-100	<Est. Time>	<Act. Time>	3	2	1	0	0
6		Actions to be Performed	Expected Results	Test Status	Bug Notes					
7		Verify that the documentation exists	Documentation as per "WLS Test Script Coding Standards" spec							
8		Run Test Developer -> Create Function List	The new scripts appear correctly.							
9		Read the documentation	The documentation is clear, readable and understandable							
10		If there are any supporting document files, verify:	File(s) name makes it clear what's inside it	Not Tested						
11			The file(s) are a Word document	Pass						
12			The content of the files is clear, readable and understandable	Not Tested						
13										
14	TIC	Test Script Review	Script Acceptance-110	<Est. Time>	<Act. Time>	7	6	0	0	1
15		Actions to be Performed	Expected Results	Test Status	Bug Notes					
16		Read the code.	The code complies with "WLS Test Script Coding Standards" spec (NA for existing scripts)	Not Tested						
17			Test Case names make sense. (NA for existing scripts)	Blocked						
18		Note: Duplicate the next 3 lines for each Test Case								
19		<Add Test Case Name Here>	The test case does what the ITP says	Not Tested						
20			The test will indeed fail if there is a bug in the DUT	Not Tested						

The Magician Apprentice Syndrome

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Pattern# 6 – The Magician Apprentice

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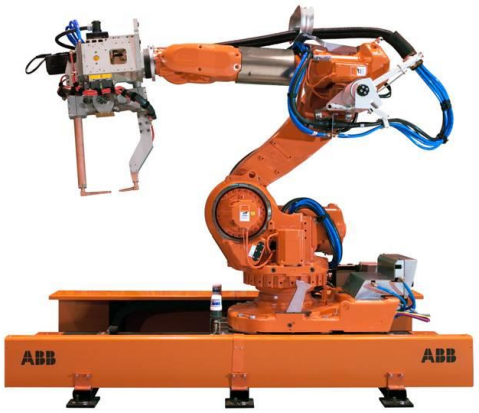
Pattern# 6 – The Magician Apprentice

Automation should not necessarily mimic humans…

… it should get the job done



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Pattern# 6 – The Magician Apprentice

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Pattern# 5 – The Magician Apprentice

- ☑ Holistic approach VS “test after test”
- ☑ Re-think, re-strategize, re-evaluate before automating
- ☑ Identify Actions, Keywords (KDT)

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Summary

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The Patterns

Mushrooming

The Competition

The Night time Fallacy

Going for the Numbers

The Magician Apprentice

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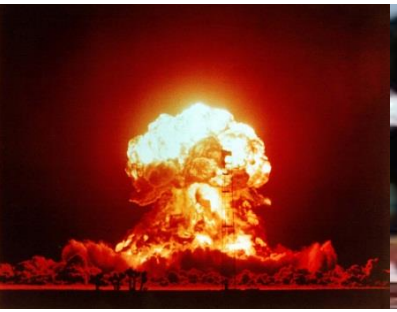
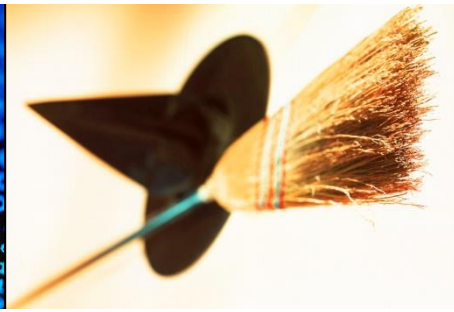
Summary

- The patterns are pervasive
- Almost inevitable
- Awareness is key (engineers; managers)
- Driven by organizational and human nature
- The solution is only partially technical





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Thank You!

Questions time…

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www.testprincipia.com

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