

Software Testing State-of-the-art & Industry-Academia Collaboration on Steroids

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CHALMERS



“Big Data” for Software Testing:

Test optimization

Test case aging

Automating System and Acceptance Testing:

Visual GUI Testing

Combining Testing approaches:

Exploratory Testing

Unit vs System Testing

Data

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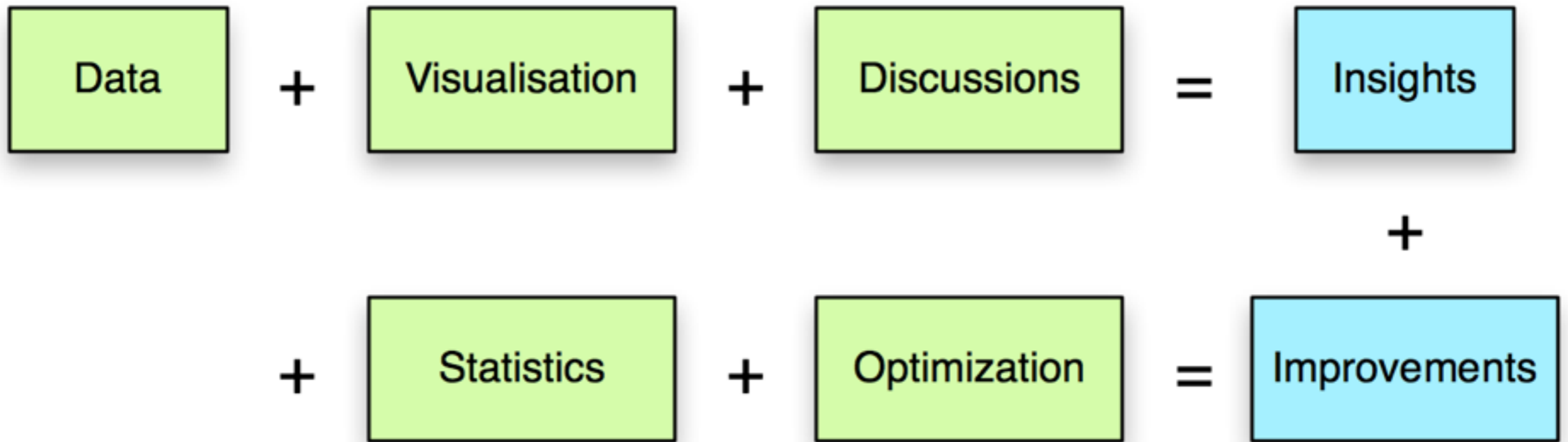
Visualisation

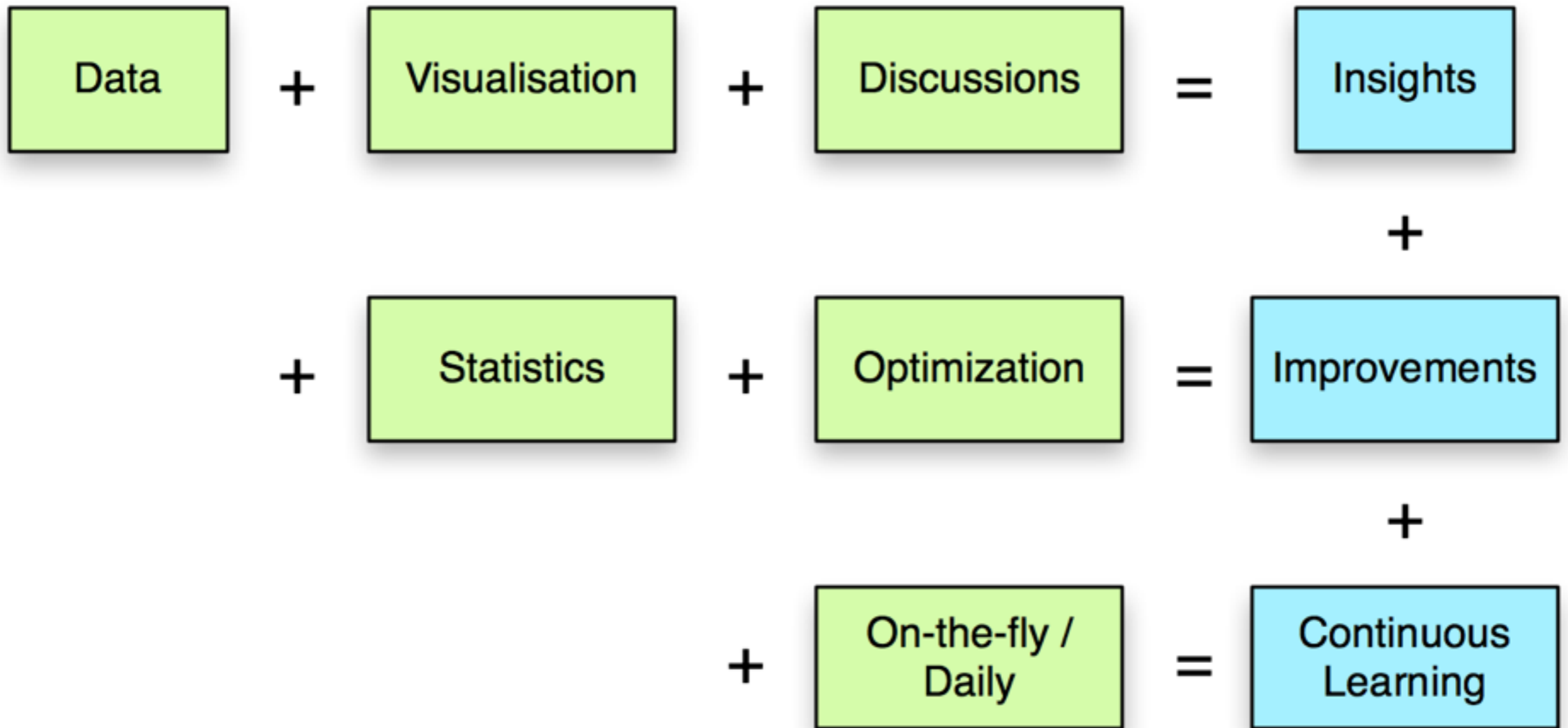
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Discussions

=

Insights

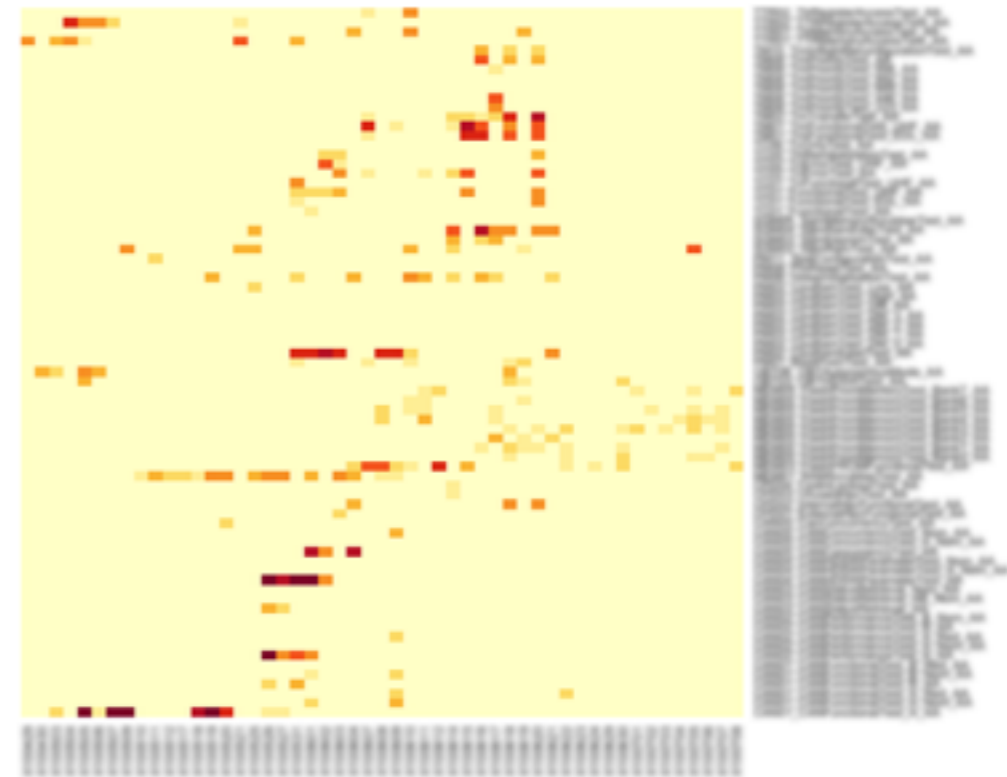
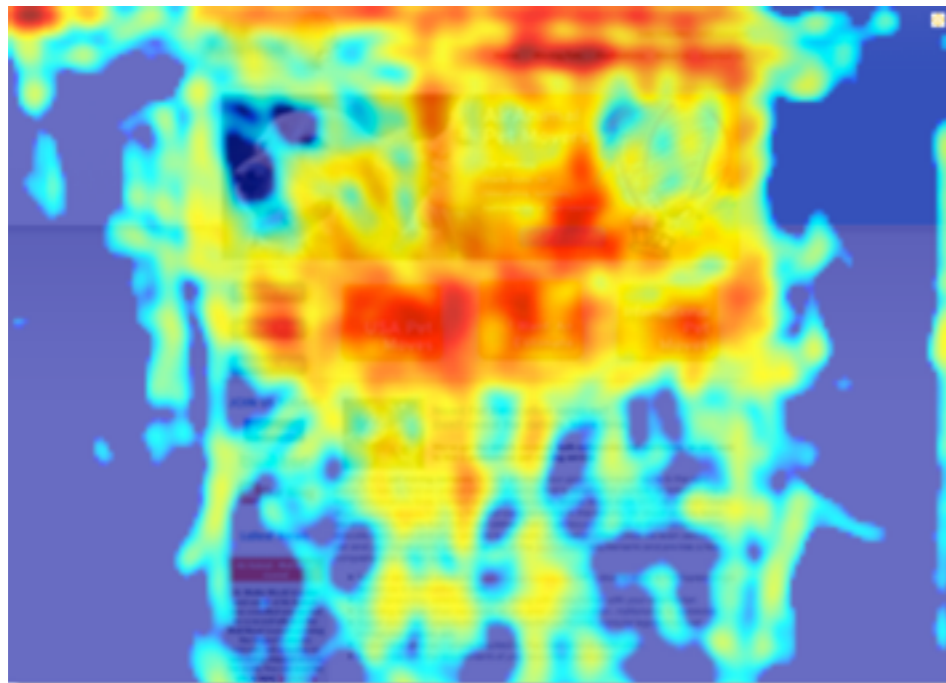




Finding patterns in test failures

TEST START TIME	TEST CASE	SYSTEM VERSION	OUTCOME
2013-09-04 04:17:12	Login non existing user	1.32 - Build 3476	PASS
2013-09-04 04:17:12	Login existing user	1.32 - Build 3476	FAIL

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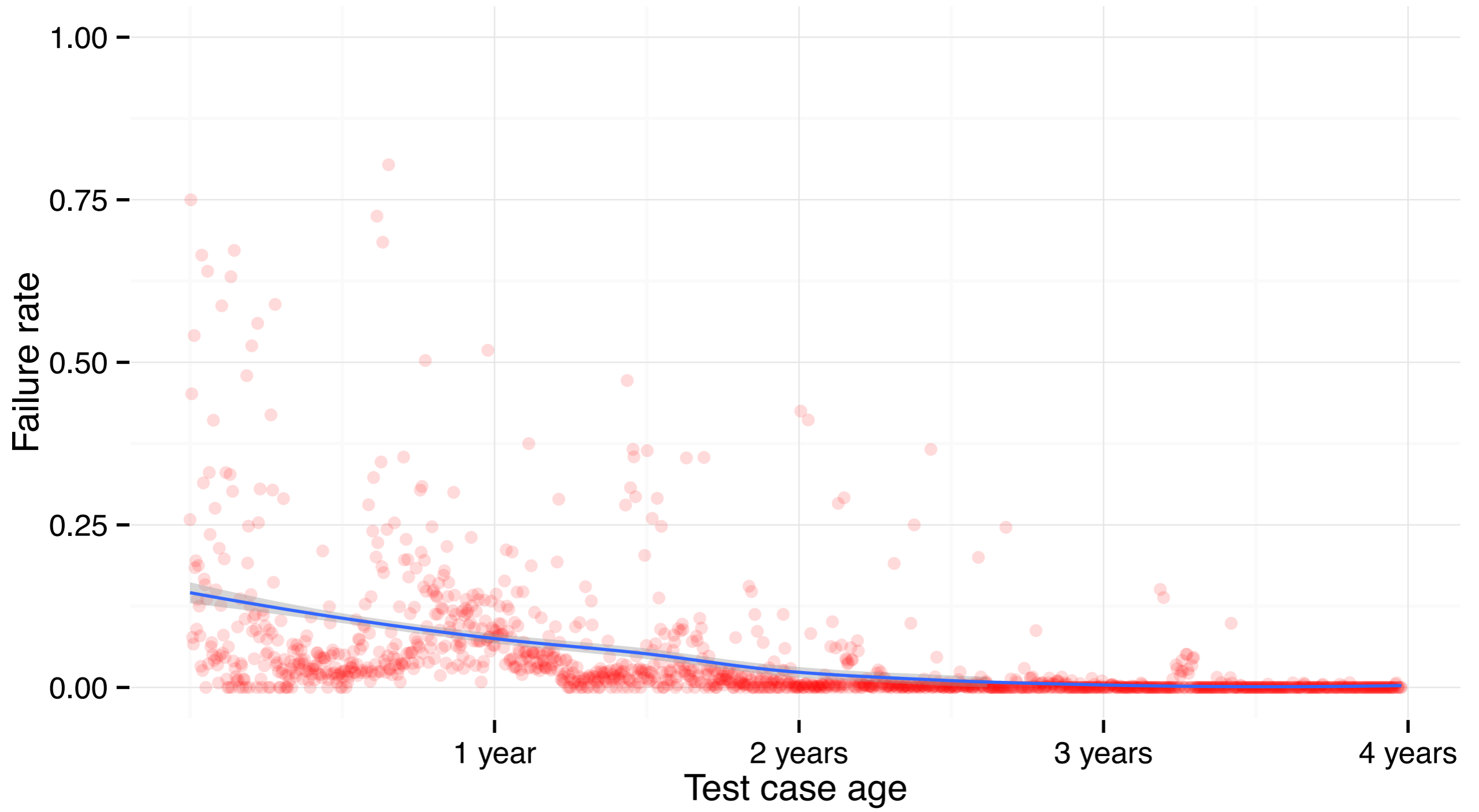
Automating System and Acceptance Testing:

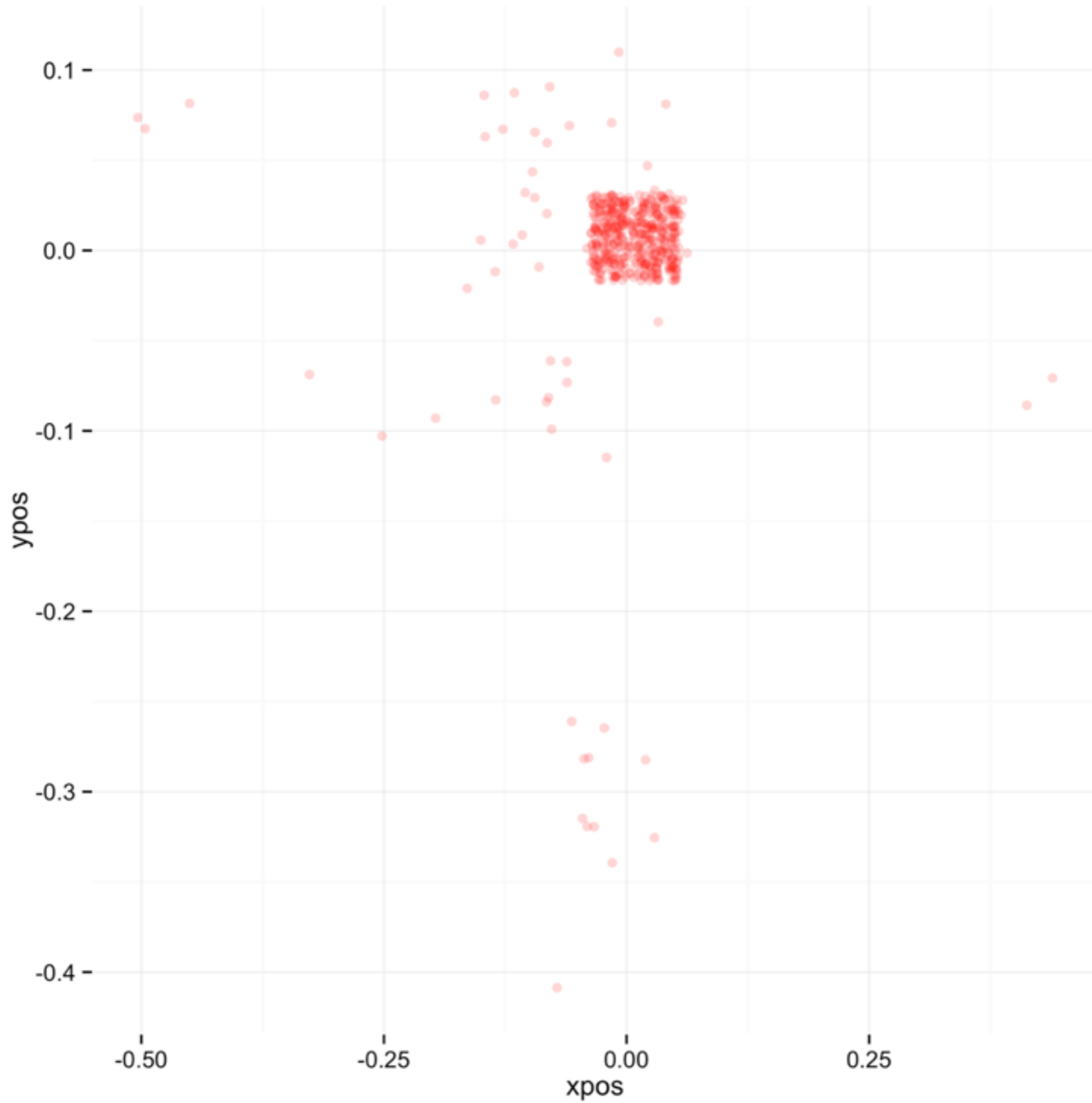
Visual GUI Testing

Combining Testing approaches:

Exploratory Testing

Unit vs System Testing





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Automating System and Acceptance Testing:

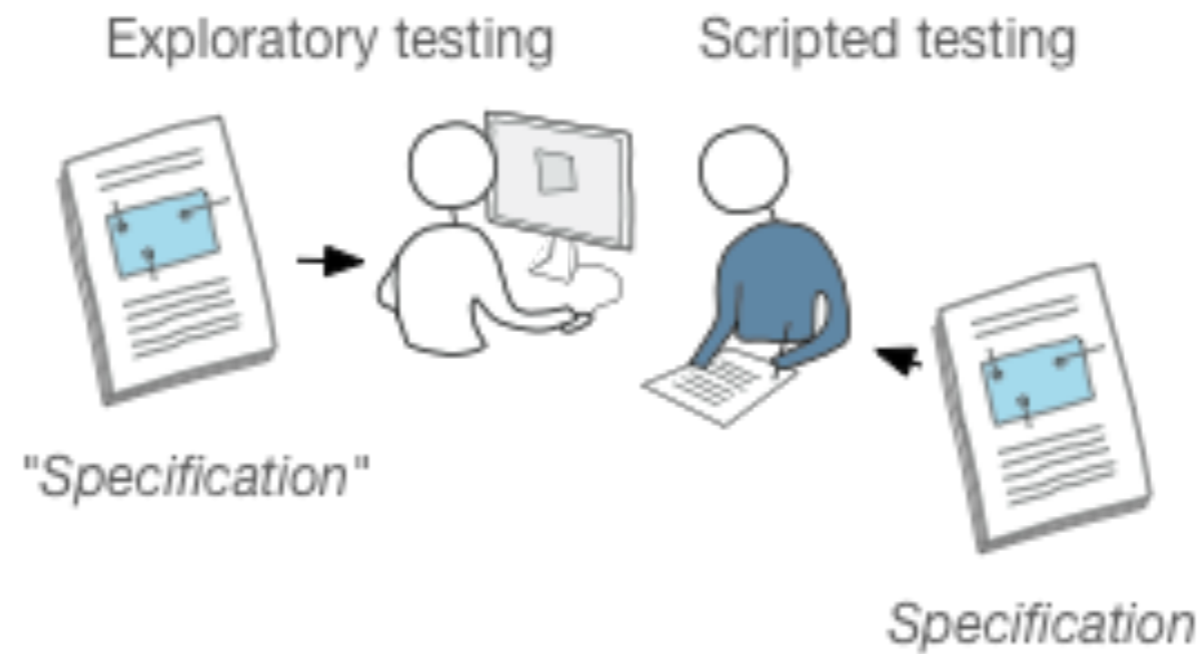
- Visual GUI Testing

Combining Testing approaches:

- Exploratory Testing**

- Unit vs System Testing

Simultaneous learning, test design and test execution



Criticism: NOT systematic & hard to automate (costly)

New results: ET is effective (32 eng & 97 students)

Engineers knowledge & experience not critical

Finds many faults (in total)

Finds as “hard” faults as scripted testing

Fewer “false positives”

More efficient (takes less time) than scripted testing

“Big Data” for Software Testing:

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Automating System and Acceptance Testing:

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Combining Testing approaches:

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Unit vs System Testing

Apples and pears (must be balanced)

Research not clear but indications are:

Unit testing finds 12% of defects & 24% of “high severity” defects

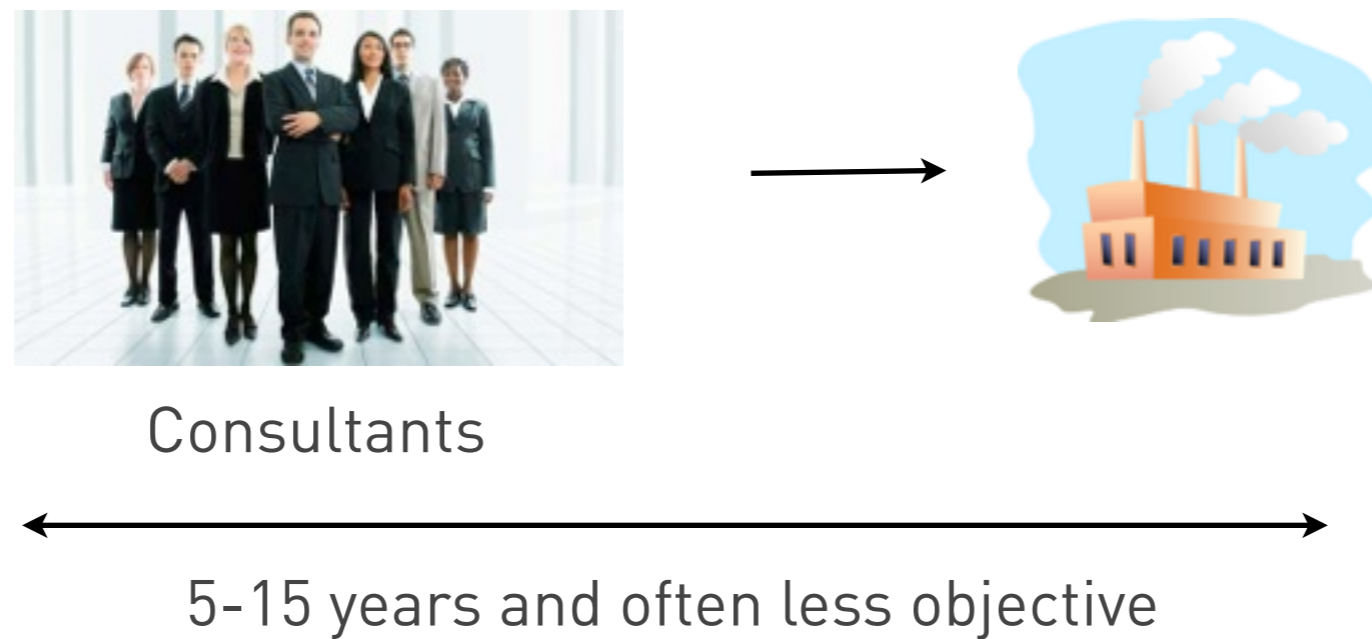
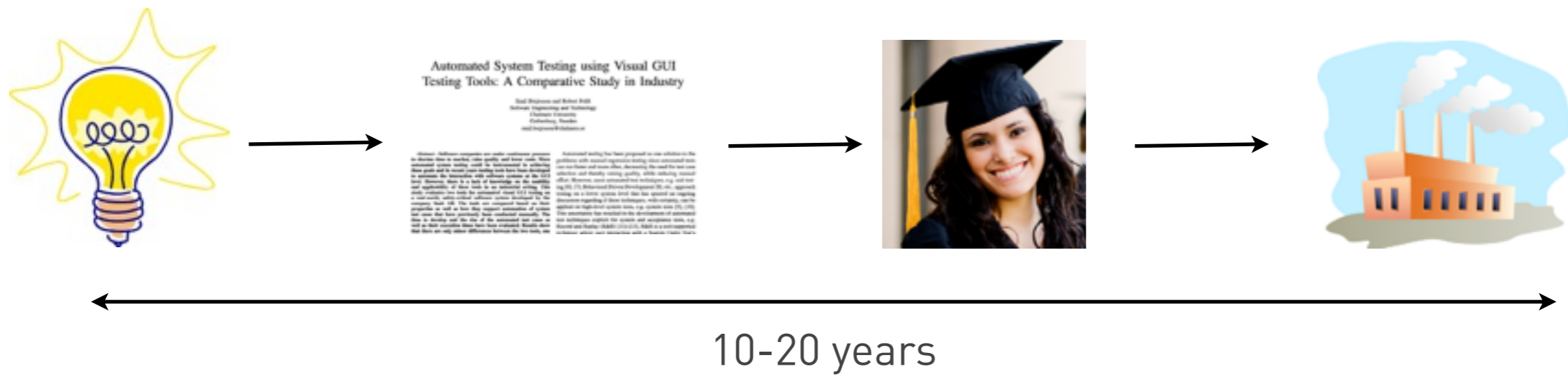
Cost to fix found defects in unit-integration-system-field
= 1-2-3-8

Reviews & inspections not as costly as thought to be

Unit testing has high maintenance costs

Cost to find and fix defects on average: 6,2h/def (system), 4,5h/def (integration) & 2,5h/def (unit)

Traditional Innovation Processes



Can we shorten this to 1 year and create a cycle?

V1.0



Animosity
& Blame



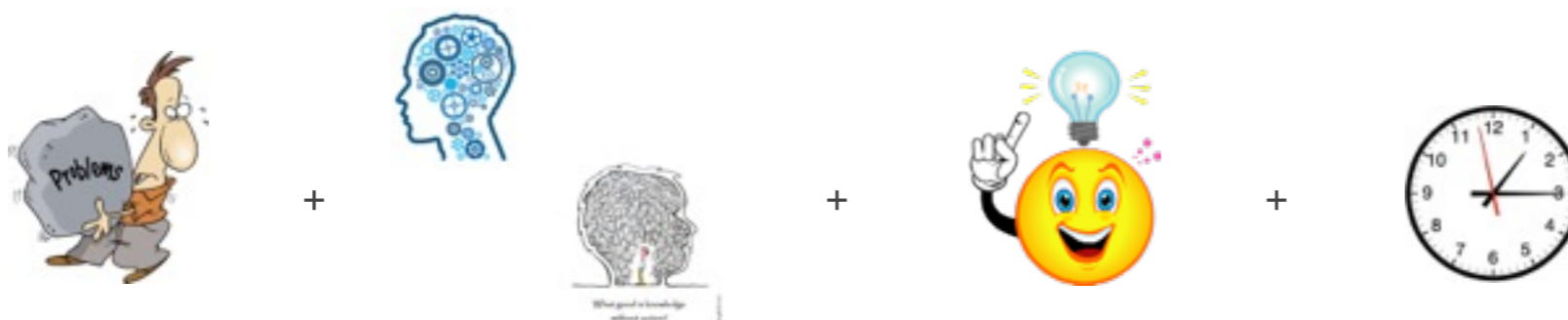
Sadness &
Dejection

V2.0



Mild optimism
for too long

V3.0



in 3-5 months
cycles

#	Type	Description
8	Embedded	Mentored employee, Continuous
7	Collaboration	Employed by company
6		Office at company
5		Recurrent visits
4		Several visits
3	Exchange	Data collection
2	Visit	(One) Visit & discussions
1		Presentation
0	Contact	Initial

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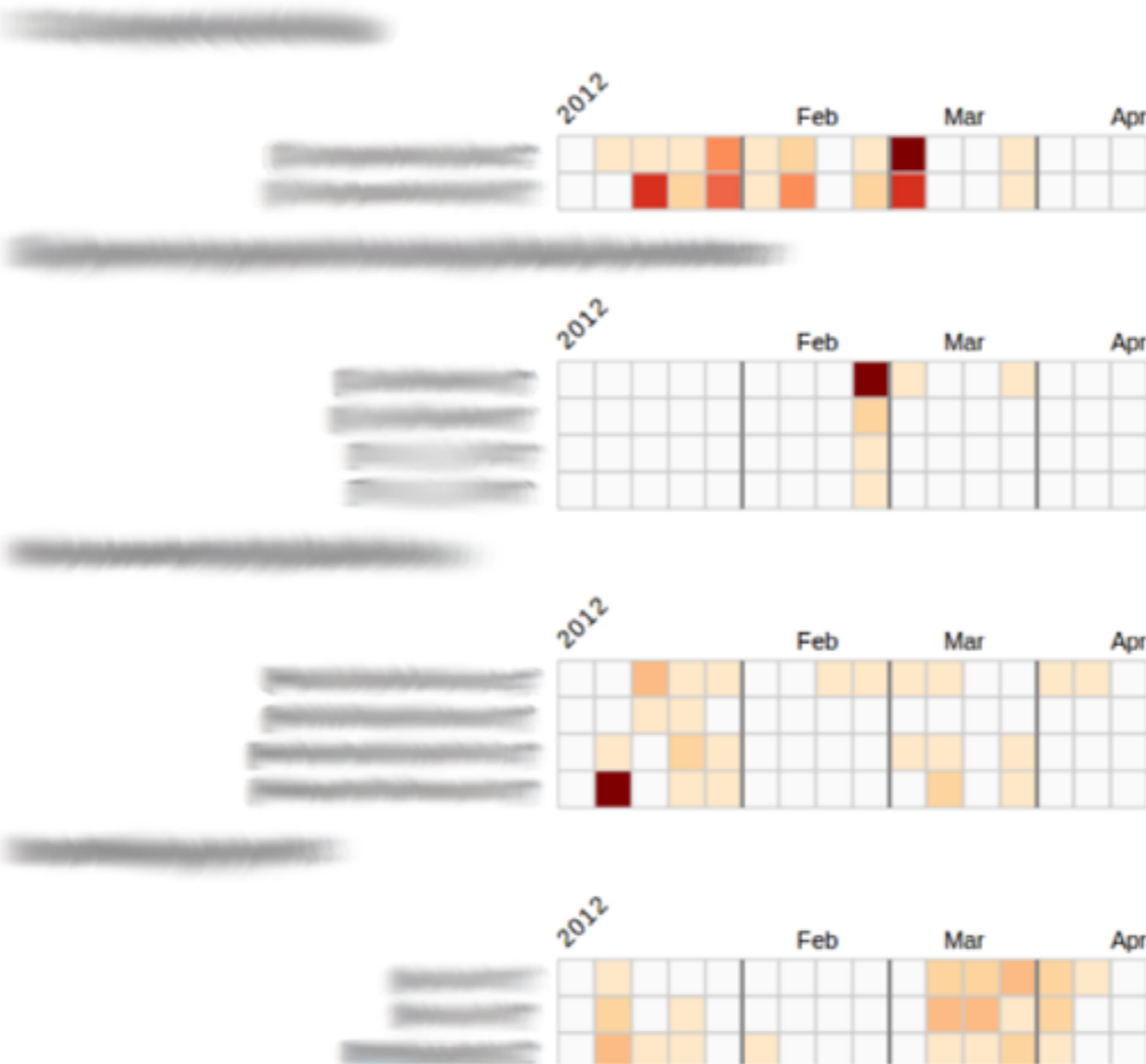
<http://explainea.com>

Taking it Online

Flight code changes [about](#)

 Range from few to many line changes

* No matching module found



Test executions [about](#)

 Range from more failed to more successful

Row numbers: Total number of executions.



Taking it Online

Test executions [about](#)

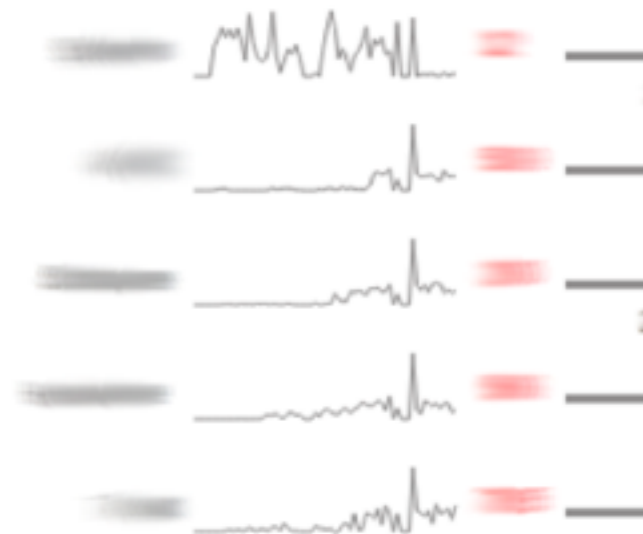
Range from more failed to more successful executions

Row numbers: Total number of executions.



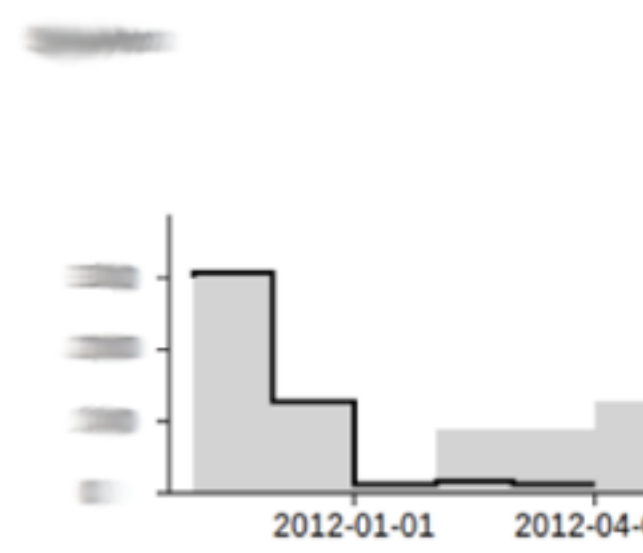
Reported & estimated

Reported hours for last 30 days



Reported & estimated

Current prognosis Reported



Taking it Online

ours

tions [about](#)

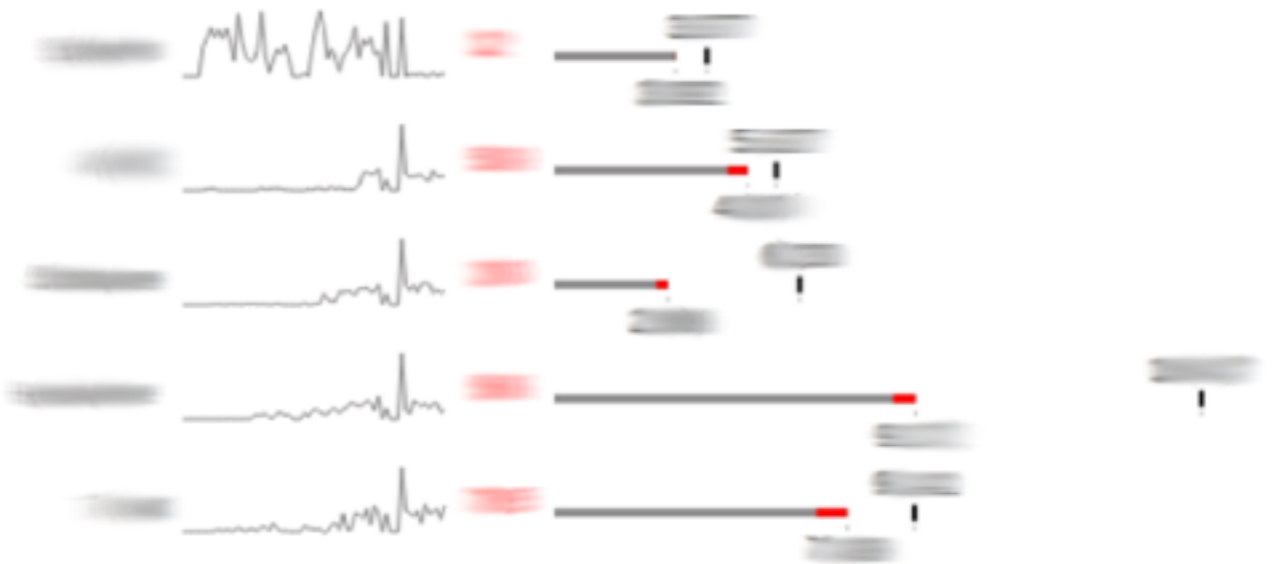
Range from more failed to more successful executions

number of executions.



Reported & estimated hours, full project [about](#)

Reported hours for last 30 days



Reported & estimated hours, monthly

Current prognosis Reported

