

# **SYMBIOTIC RELATIONSHIPS BETWEEN TESTING AND ANALYTICS**

**KEYNOTE @NORDIC TESTING DAYS  
CONFERENCE 06 JUNE 2013**



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**JULIAN HARTY**

Contact me: [julianharty@gmail.com](mailto:julianharty@gmail.com)

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# SYMBIOSIS

A relationship between multiple entities

3 main types of symbiosis




1. Parasitism: one ***benefits***, the other ***suffers***
2. Commensalism: one ***benefits***, the other is ***unaffected***
3. Mutualism: ***both benefit***



The Zebra has good eyesight and Wildebeest a good sense of smell

Between them they detect predators early and protect one another

# SOURCES OF FEEDBACK

- For our software
  - For our testing
  - For the development
- 
- From our apps?
- From our fixed bugs

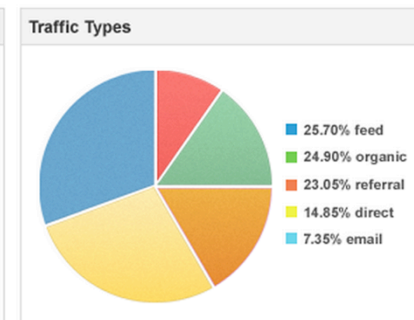
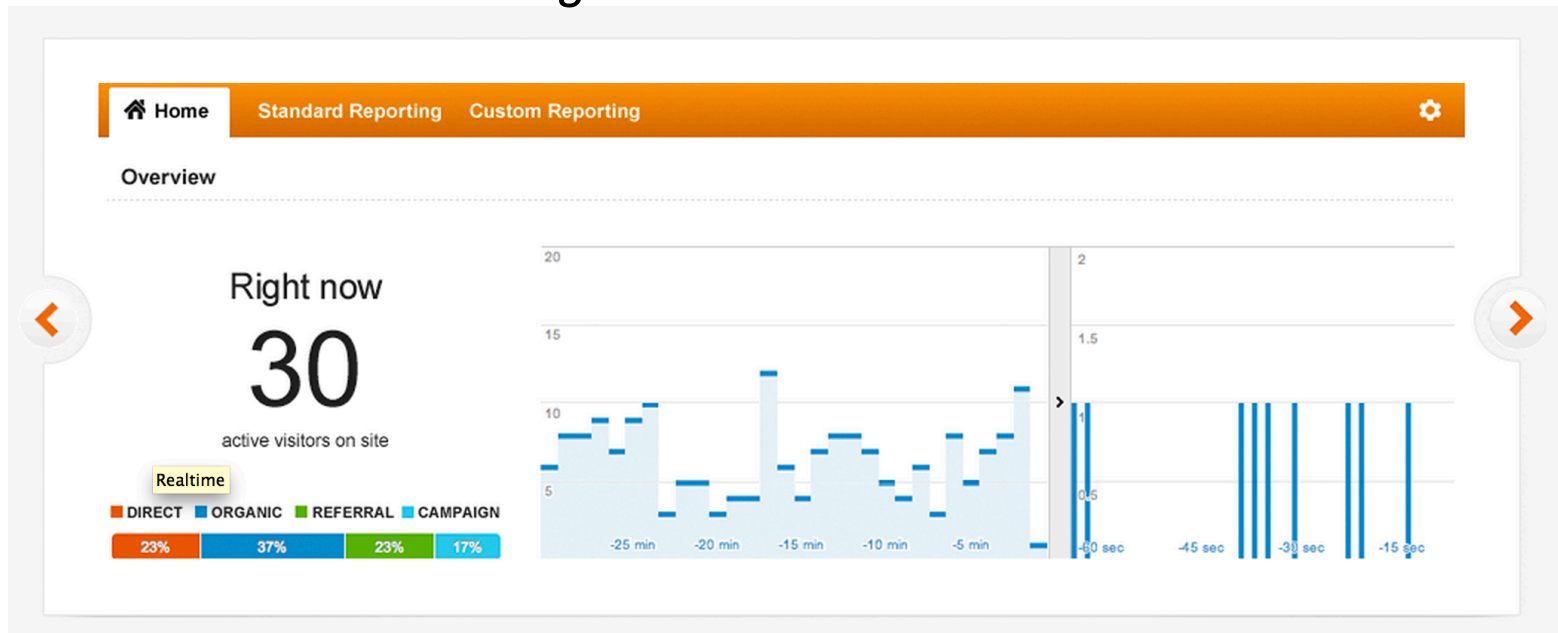
When do we get the feedback?  
And how good is it?

# **SYMBIOTIC RELATIONSHIPS BETWEEN TESTING AND ANALYTICS**

# **ANALYTICS**

# WHAT IS ANALYTICS?

Statistics + Computer Science + Operational Research,  
leads to: *actionable insights*



<http://www.google.com/analytics/>

# ANALYTICS

Commonplace in Web, Games<sup>[1]</sup> & Mobile<sup>[2]</sup> apps

- Developers add code to send extra data over the network
- Third-parties often provide the libraries
- May impact privacy
- May include crash-reporting

[1] <http://www.wired.co.uk/magazine/archive/2012/01/features/test-test-test>

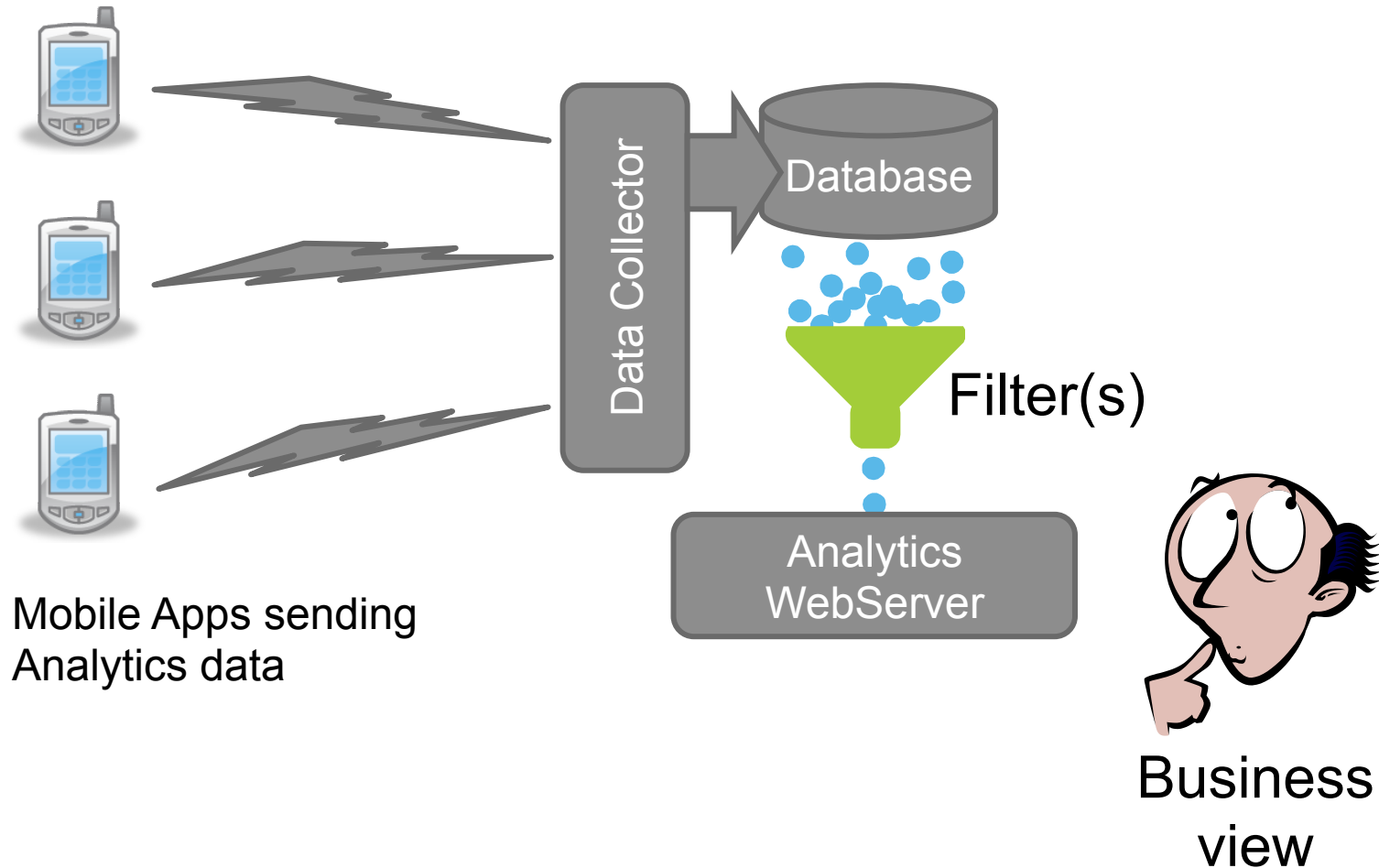
[2] A Study of Third-Party Tracking by Mobile Apps in the Wild, UW-CSE-12-03-01,  
<ftp://ftp.cs.washington.edu/tr/2012/.../UW-CSE-12-03-01.PDF>

# THIRD PARTIES



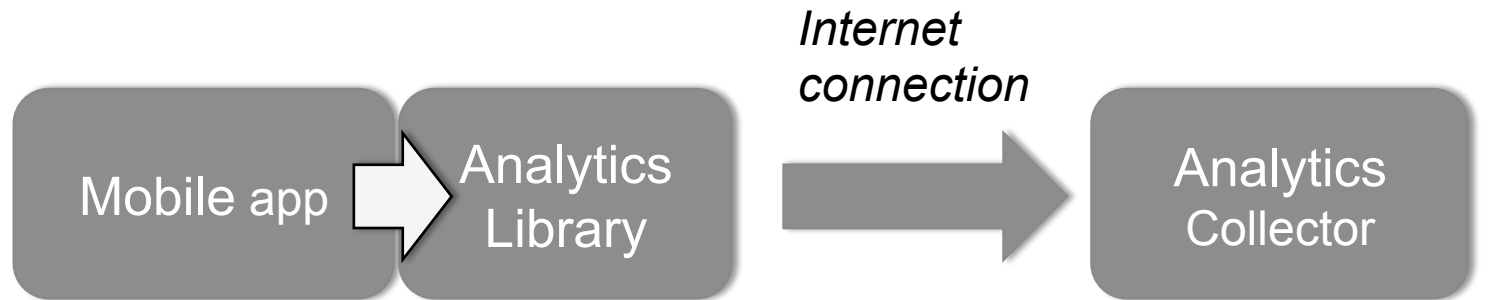
**What does the user get from this equation?**

# TOPOLOGY



**Overview of Mobile Analytics**  
Each step may be delayed

# TYPES OF EVENTS



1:1 App-initiated event



m:1 App-initiated event



Library-initiated event



# ANALYTICS

Often linked to experiments, e.g.

- A/B Testing<sup>[1][3]</sup>
- Multivariate Testing<sup>[2]</sup>

Similar to:

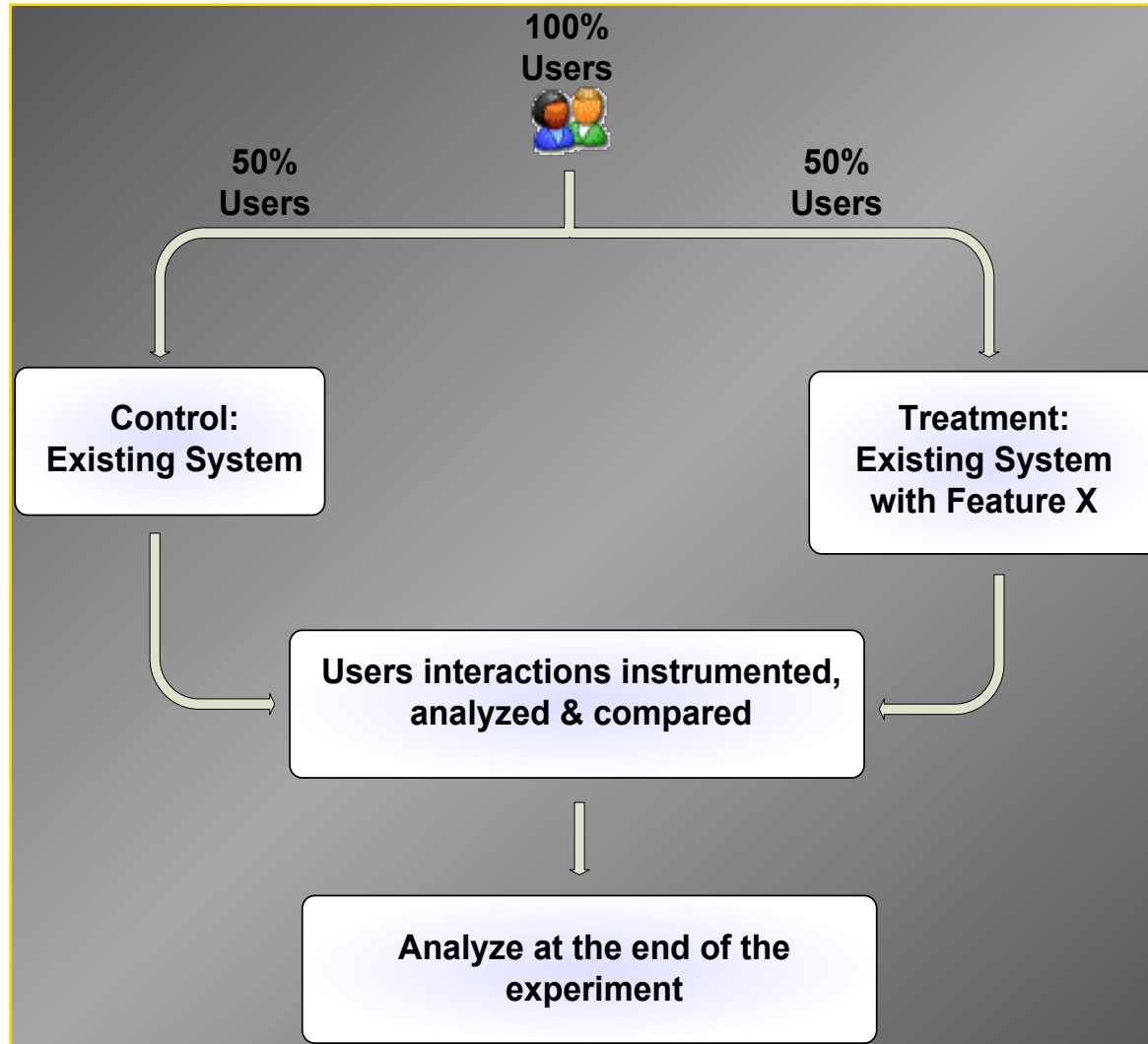
[1] One Factor at A Time (OFAT)

[2] Multiple Factors at A Time (MFAT)

[3] <http://www.wired.com/business/2012/05/the-ab-test-results-are-in/>

# ANATOMY OF A CONTROLLED EXPERIMENT

Diagram courtesy of  
Keith Stobie



# A/B TEST

Diagram courtesy of  
Keith Stobie

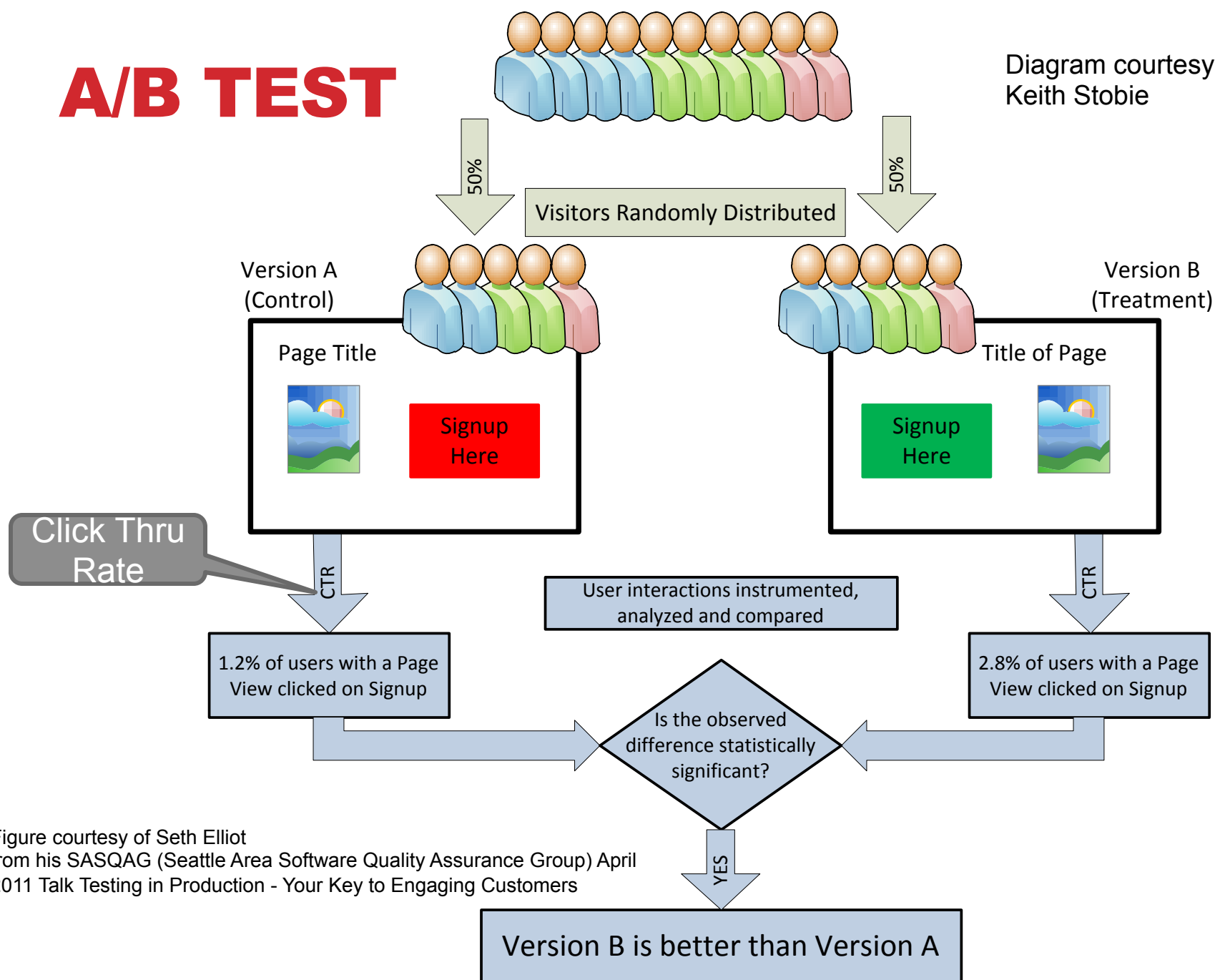


Figure courtesy of Seth Elliot  
from his SASQAG (Seattle Area Software Quality Assurance Group) April  
2011 Talk Testing in Production - Your Key to Engaging Customers

# WHAT SHOULD WE MEASURE?

- **Performance**
  - Time taken
  - Resource consumption?
- **Reliability**
  - Mean Time Between Failure (MTBF)
  - Probability of Failure On Demand (POFOD)
- **Usability**
  - Task completion rate
  - Was the task completed successfully?

**SYMBIOTIC RELATIONSHIPS BETWEEN TESTING  
AND ANALYTICS**

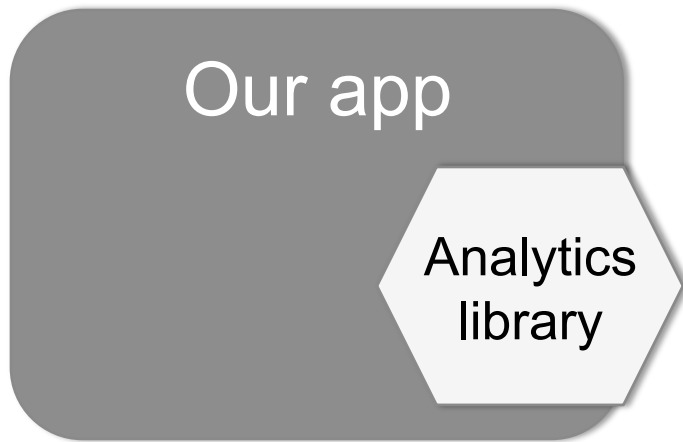
# **CALIBRATION**

# **CALIBRATING**

- **The tools**
- **Our understanding**
- **Our practices**

# IMPLEMENTATION OPTIONS

## MOBILE & DESKTOP



Library lives inside our app  
First party

- **equal rights**

Has an *independent life*

## WEB CONTENT



JavaScript / 1 pixel image  
Third-party

- **permission-based**

# WHAT'S INSIDE?



What does the analytics library do?

What *else* does it do?

How much should we trust & rely on it?

*Quis custodiet ipsos custodes?*

What about?

- Offline behaviour
- Access to sensitive data – increases the potential for harm...
- Consumption of resources
- Ease of control
- Ease of implementation
- Explaining to users what's happening...

# VALIDATION & VERIFICATION

Validation: is it useful to us? And to all concerned?

Verification: does it do what it claims to do?

- Inaccuracies & precision
- Performance testing
  - Latency
  - Accuracy
  - Volumes
- Triangulation: with other libraries

**SYMBIOTIC RELATIONSHIPS BETWEEN TESTING  
AND ANALYTICS**

**POTENTIAL  
PITFALLS**

# POTENTIAL PITFALLS

No one shall be subjected to arbitrary interference with his **privacy**, family, home or correspondence, nor to attacks upon his honour and reputation. Everyone has the right to the protection of the law against such interference or attacks.

Article 12 The Universal Declaration of Human Rights

<http://www.un.org/en/documents/udhr/index.shtml#a12>

# Why KISSmetrics?

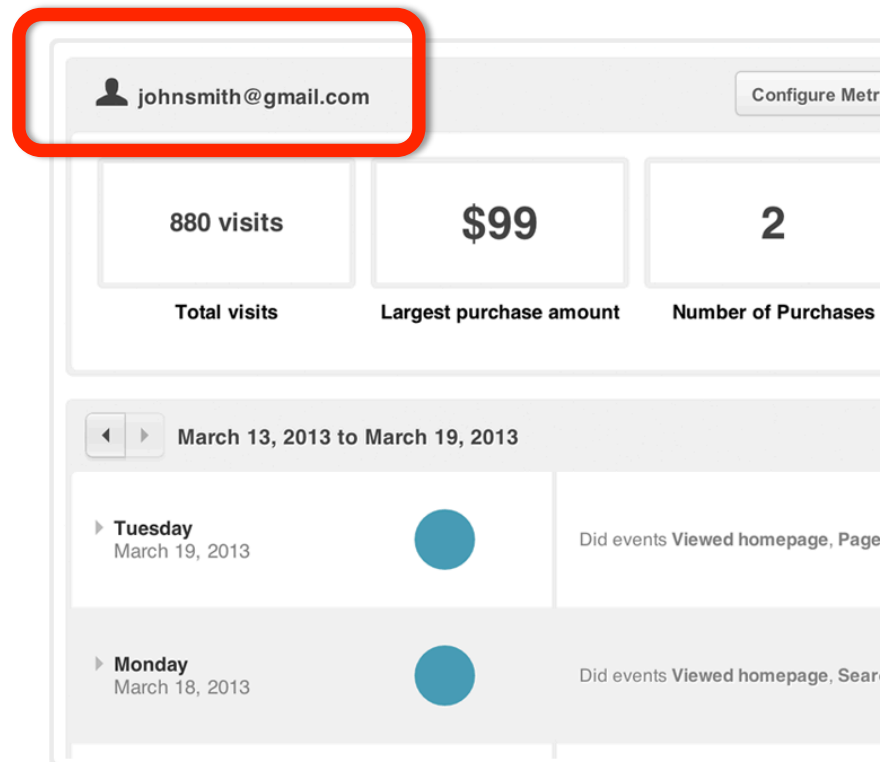
Our actionable metrics tell you more than what happened. They also tell you *who* and *why*.

1

## We help you get to know your people.

The basic unit in KISSmetrics is a person. When you view your KISSmetrics reports they show you people, not just aggregate data.

- ▶ Have a big customer that came to your site and is using your product? KISSmetrics will help you see everything they did **before** and **after** they signed up. Use this knowledge to give them the best service and learn how to get more people like them.
- ▶ Get engineering, product, sales, marketing and customer support working together to improve the metrics that matter for the life blood of your business: your people.



<http://www.kissmetrics.com/why>

# POTENTIAL PITFALLS

## Fidelity

- Correlation
- Consistency
- Reliability

# POTENTIAL PITFALLS

## Messy separations

- Who owns the data & can you get it in a usable form?
- Changing the yardstick

*A traditional tale tells the story of Henry I (1100-1135) who decreed that the yard should be "the distance from the tip of the King's nose to the end of his outstretched thumb".*



**SYMBIOTIC RELATIONSHIPS BETWEEN TESTING  
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# **APPLYING THE CONCEPTS**

# GETTING STARTED

**Start by designing the events**



*Iterate...*



*Iterate...*

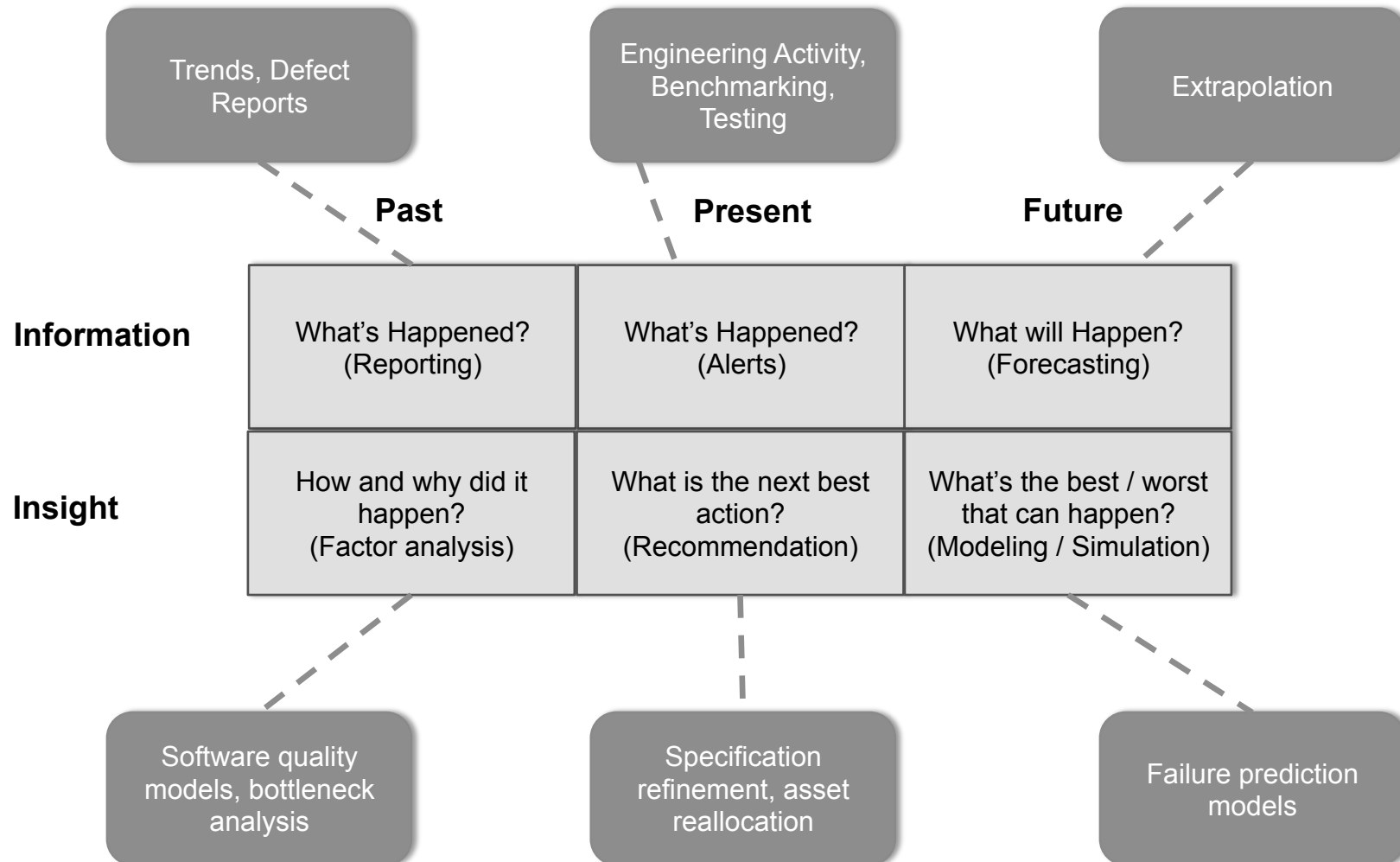


# POSSIBLE ASSESSMENT CRITERIA

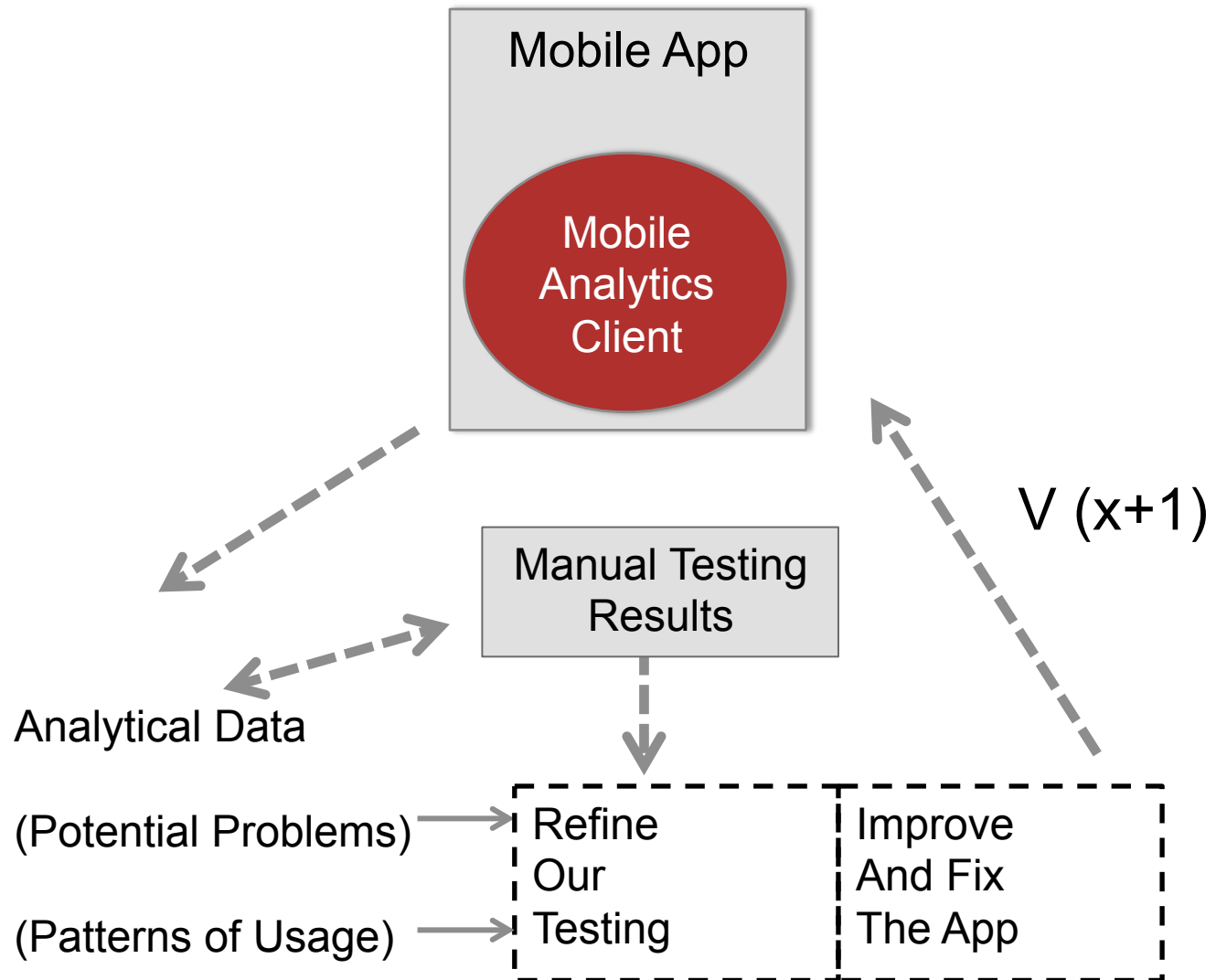
Colour	Criteria
Yellow	Benefits of using Analytics
White	Safety rating
Purple	Fidelity
Red	Feelings of the stakeholders
White	Safety / Trust rating
Green	Eco-rating
Black	Problems, Privacy, Risks

c.f. Six Thinking Hats – six directions of thinking

# ANALYTICAL QUESTIONS



# IMPROVE OUR APP WORKFLOW



# REFINE OUR TESTING

## Crashes

- Bugs we didn't find c.f. Defect Detection Percentage (DDP)<sup>[1]</sup>

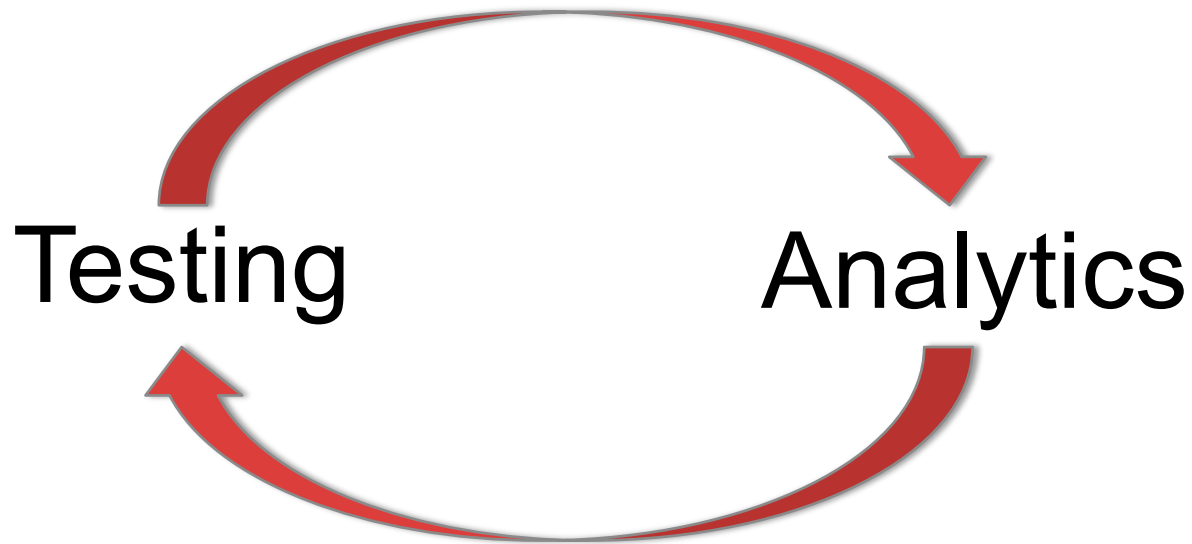
## Usage patterns

- Personas
- Navigation and other functional test cases
- Localization Testing

## Testing in production

- Greater use of experiments

[1] D. Graham, Measuring the effectiveness of testing using DDP  
[http://www.dorothygraham.co.uk/downloads/generalPdfs/DDP\\_Tutorial.pdf](http://www.dorothygraham.co.uk/downloads/generalPdfs/DDP_Tutorial.pdf)

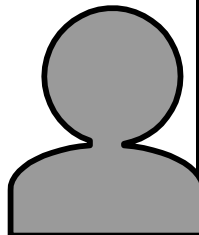
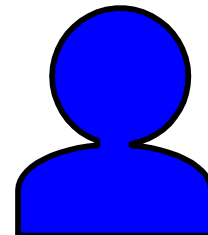


***Quis custodiet ipsos custodes?***

- Can we trust the Analytics software and reports?
- Who tests them?

Once we have confidence in the tools we can use Analytics to:

- Better understand our apps and how they are used
- Find problems sooner; and predict problems & their impact
- Better understand and improve our testing



# CONCLUSIONS

*“The truth, the whole truth and nothing but the truth, so help me God” [1]*

Test and evaluate the libraries, the performance, the obligations, the ownership

If you are going to use Analytics, use them well, & to improve the quality

Consider the benefits for every stakeholder

“Quality is value to some person(s)” Gerald Weinberg

[1] English law since 1189, [http://www.phrases.org.uk/bulletin\\_board/44/messages/562.html](http://www.phrases.org.uk/bulletin_board/44/messages/562.html)

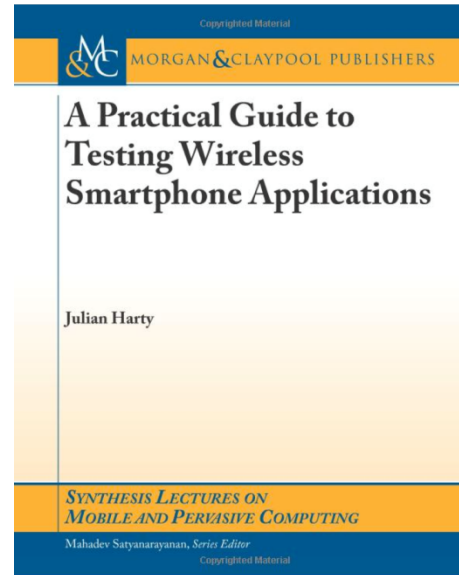
# SOME FURTHER READINGS



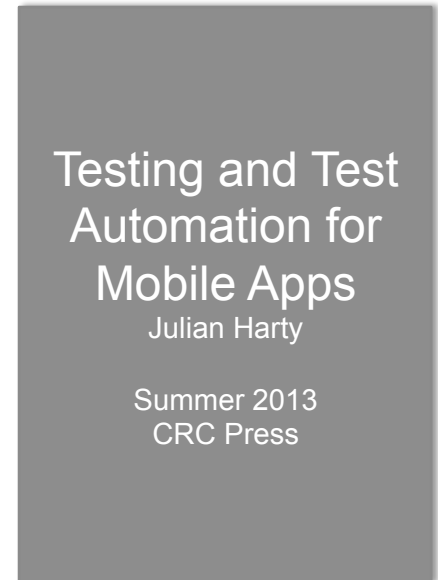
**Development**



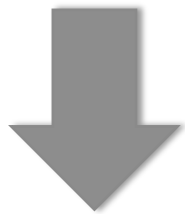
**Marketing**



**Testing(2009)**



**Testing(2013)**



[http://www.wipconnector.com/download/GuideToTheParallelUniverse\\_3rdEdition.pdf](http://www.wipconnector.com/download/GuideToTheParallelUniverse_3rdEdition.pdf)

[http://www.enough.de/fileadmin/uploads/dev\\_guide\\_pdfs/Guide\\_12thEdition\\_WEB.pdf](http://www.enough.de/fileadmin/uploads/dev_guide_pdfs/Guide_12thEdition_WEB.pdf)

If you want to know more about software quality & mobile analytics, get in contact:

**[julianharty@gmail.com](mailto:julianharty@gmail.com)**

**Q&A ?**