

Global Trends in Software Testing

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(Part 2 of 2)

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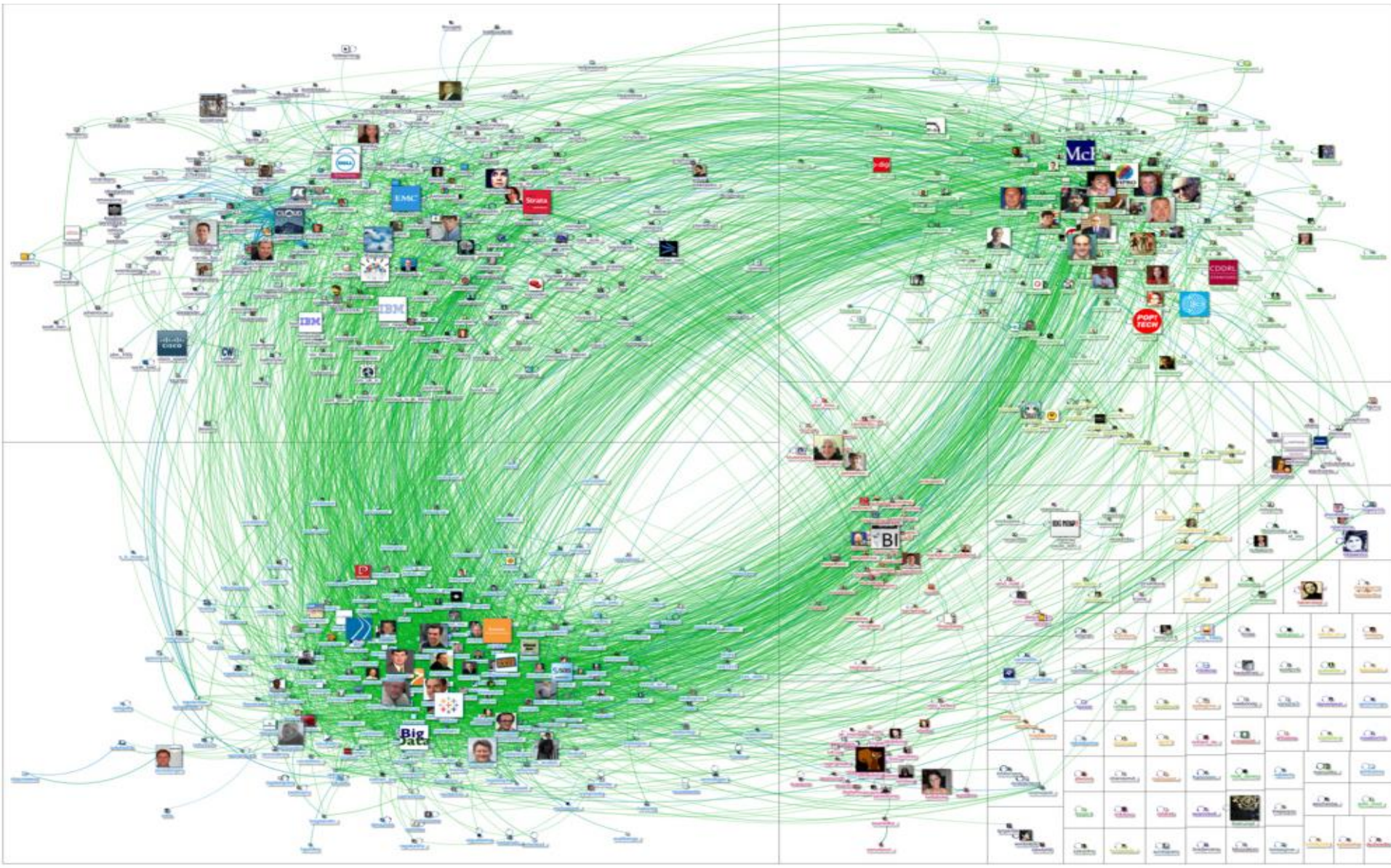
Scope

- **Digital Disruption & Technology Enablers**
- **Testing Budgets & Testing Centres of Excellence**
- **Mobile & Crowd Testing**

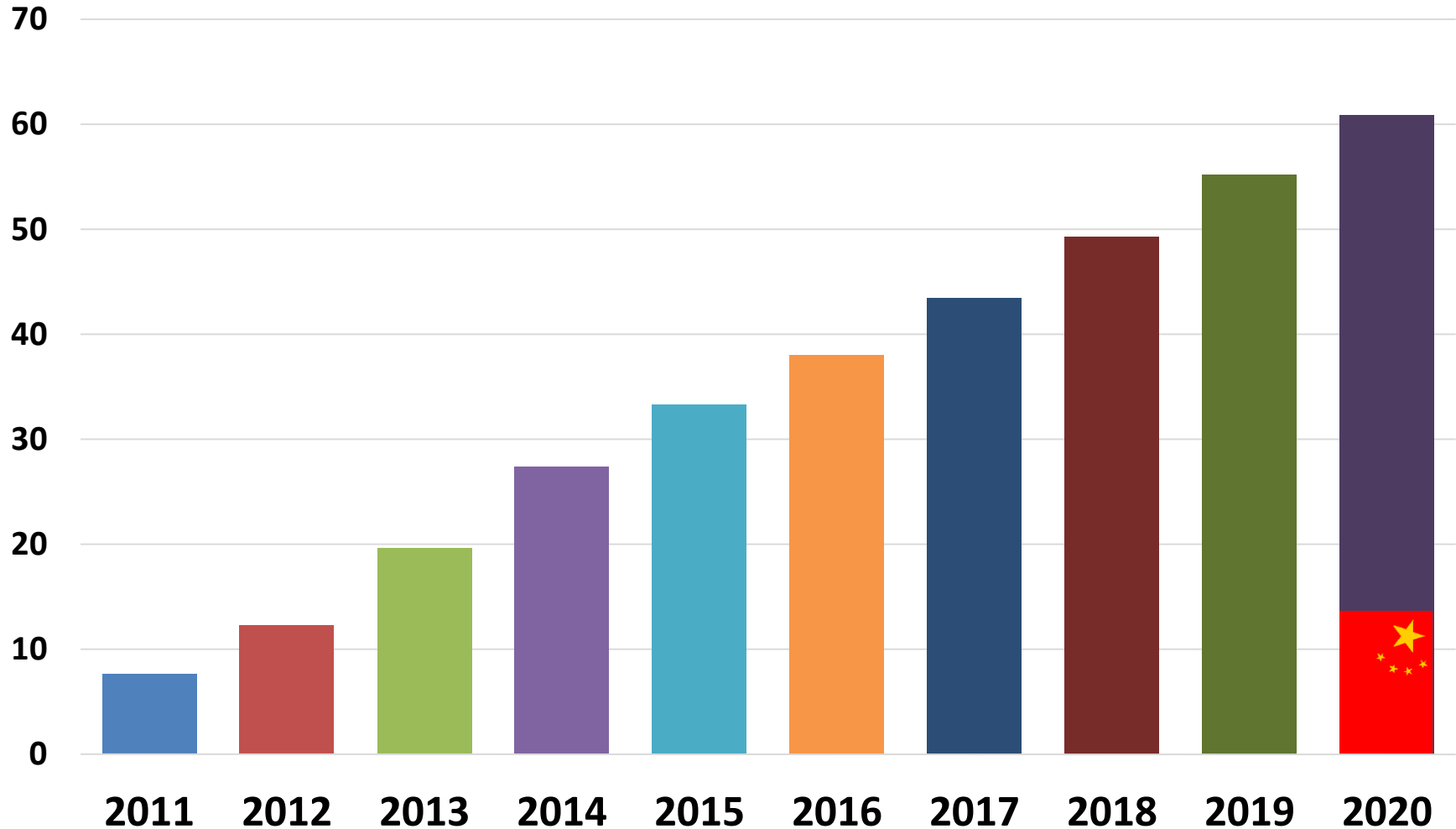
See Part 1 for above topics

- **Big Data & Fuzz Testing**
- **Cloud & Chaos Monkeys**
- **Virtualization & Containers**
- **Social Media & A/B Testing**
- **Agile & Continuous Integration**

Big Data



Big Data Market Forecast (Billion \$)



Most Important Big Data Issues

47%

Security



46%

Cost



Big Data & Analytics Testing

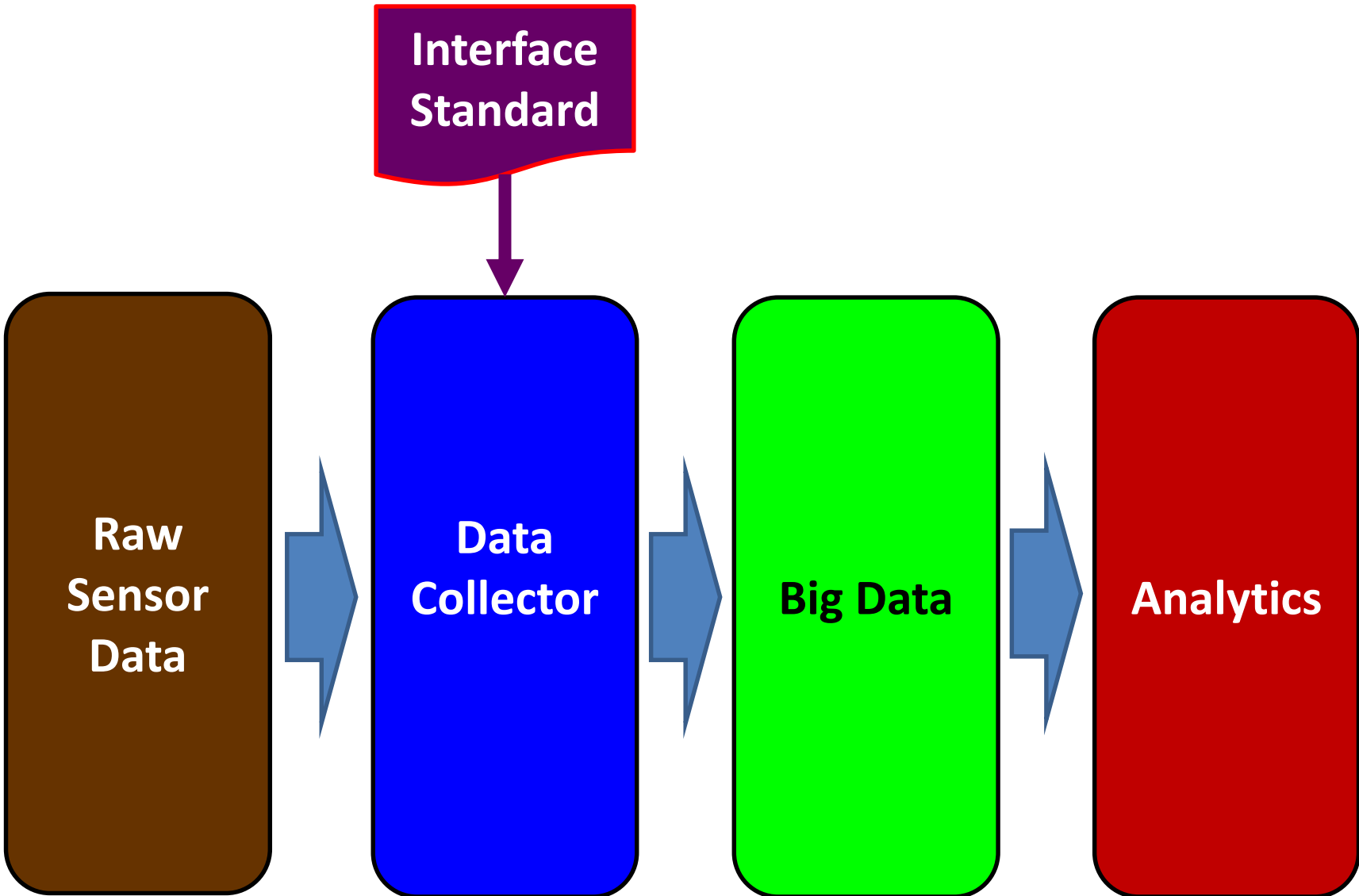
- **Testing using Big Data & Analytics**
 - Analytics provide information on security vulnerabilities to test
 - Analytics provide information on usage and defect profiles and so inform Risk-Based Testing
- **Testing of Big Data & Analytics**
 - Performance Testing
 - testing that results are available in a useful timeframe (esp. real-time)
 - Deterministic vs Probabilistic
 - Probabilistic results must be validated with users/experts
 - Test Data Availability
 - large scale
 - real-time
 - sanitized or real
 - Data Validity Testing
 - Data is secure and useful (filtered)...

Example Data Volumes

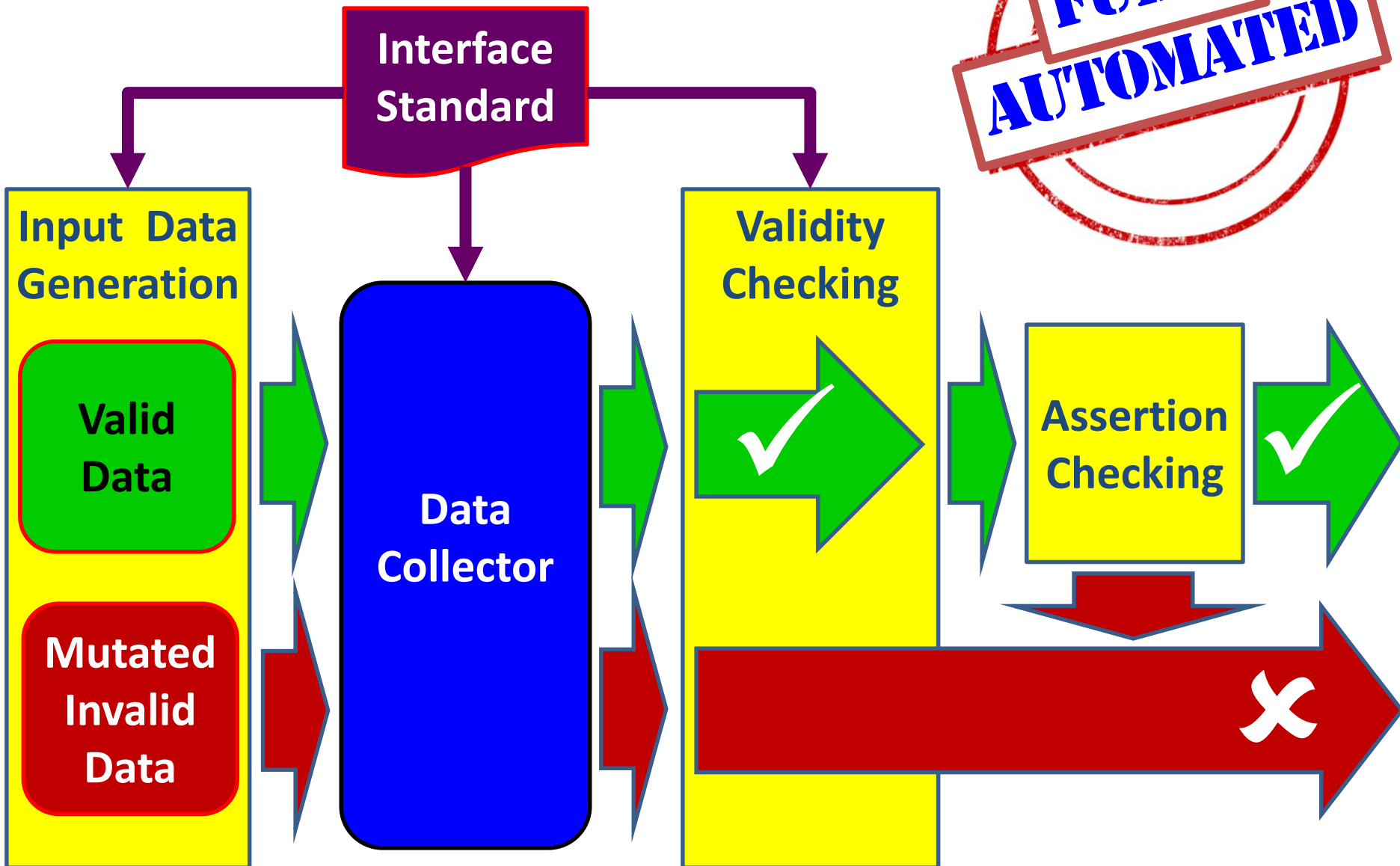
- **Airliner**
 - 3 GB/hour
- **CCTV**
 - 1 TB/month
- **Mobile Phone Operator**
 - 3 TB/day
- **Globally**
 - 2.5 Million TB/day



Data Validity



Fuzz Testing

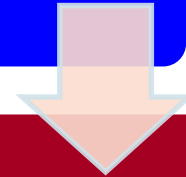


Data Analytics

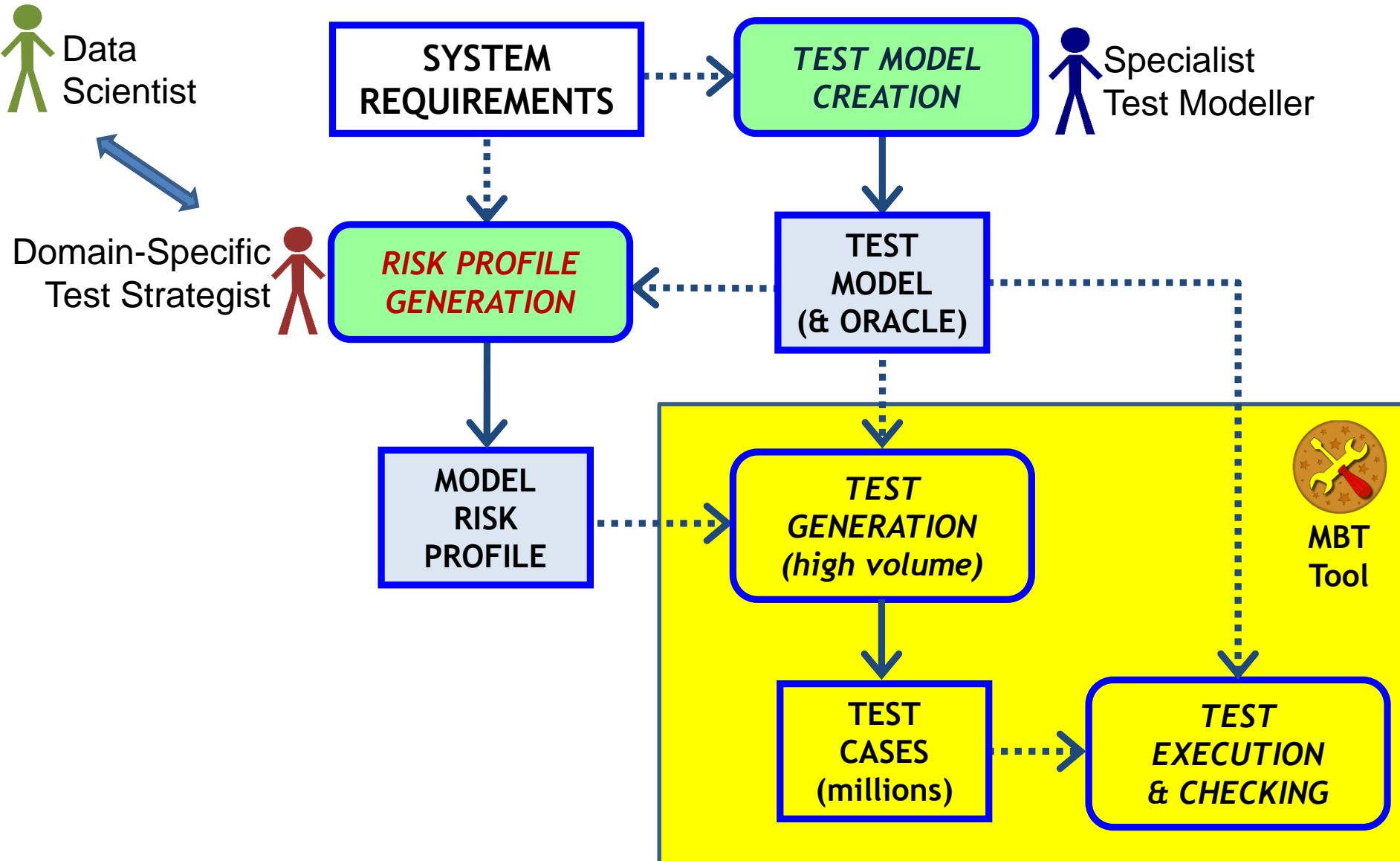
Data

마법

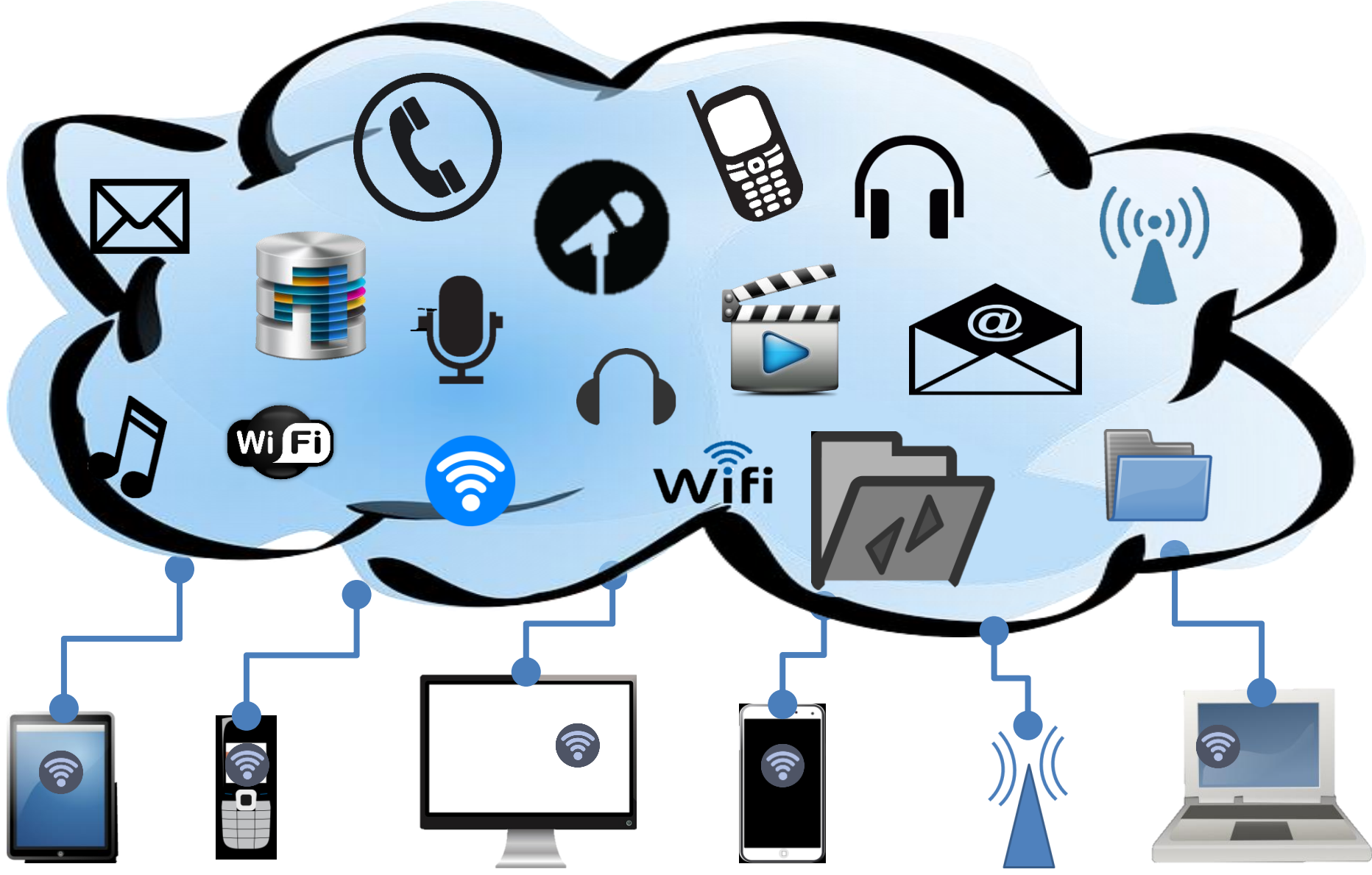
Assets



Model-Based Testing for Data Analytics



Cloud & Virtualization (& Containers)

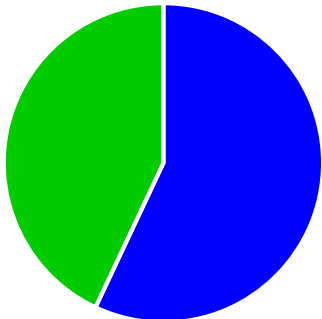


Why Cloud?

- **Power**
- **Elasticity / Scalability**
- **Affordability**
 - Pay per Use Model
- **Low Maintenance**
- **Reliability**
 - but not as good as you might think
- **BUT**
 - Security Fears (52% of users)
 - Lack of Control
 - Costs

Cloud Adoption

Global Cloud Services Market
predicted at \$555 Billion by 2020
(from \$210 Billion in 2014)



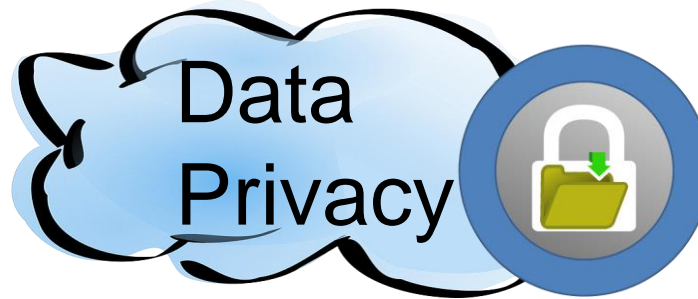
57% of organizations are already using
or are planning to use the cloud in 2015
(84% in the UK)

Most Important Cloud Issues

82%



81%



78%



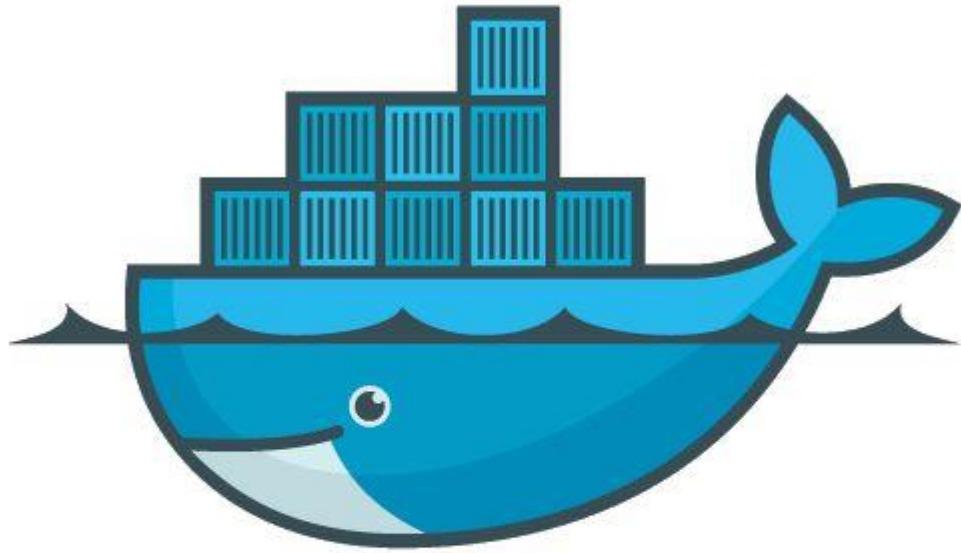
Cloud Testing

- **Testing using the Cloud**
 - Testing as a Service
 - Test tools (fewer licenses sitting idle)
 - Testing from the Cloud (e.g. generating virtual users, anywhere)
- **Testing of Cloud-based Apps**
 - Test Environments same as Production
 - 20-30% Cost Reductions
 - Performance/Load Testing
 - due to varied hardware architectures
 - Hybrid Cloud Testing
 - Security Testing
 - encryption/decryption
 - Chaos Monkeys...

Chaos Monkeys

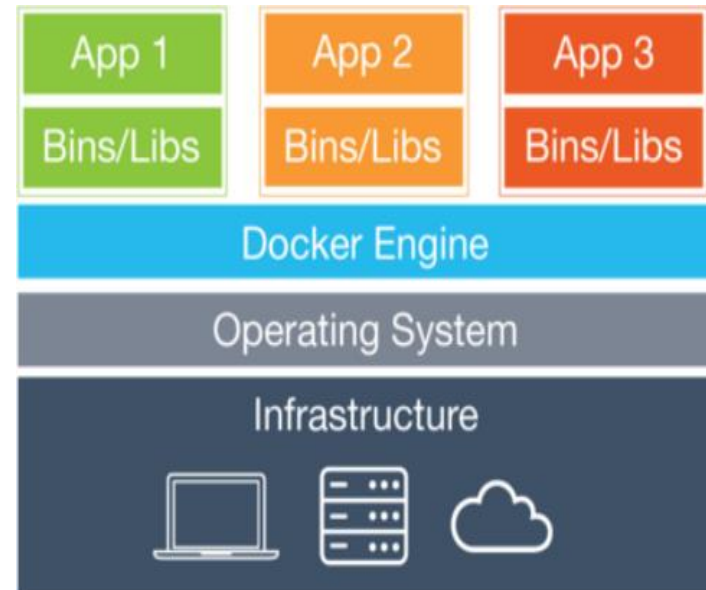
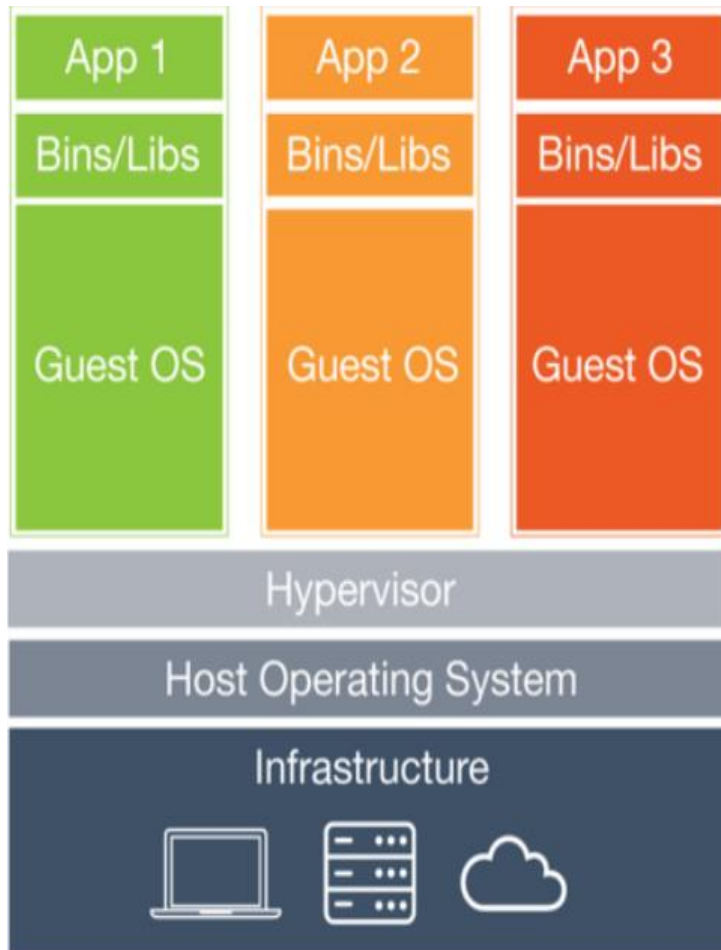
- **Open Source tools for testing Cloud-based systems**
- **Chaos Monkeys randomly disable (in work hours) instances to test whether the system can survive failures in the cloud infrastructure**
- **Simian Army**
 - Security Monkey, Janitor Monkey, etc.
 - Chaos Kong kills whole AWS regions
- **Netflix survived Amazon rebooting 10% of EC2 servers in Sept 2014 with no downtime**





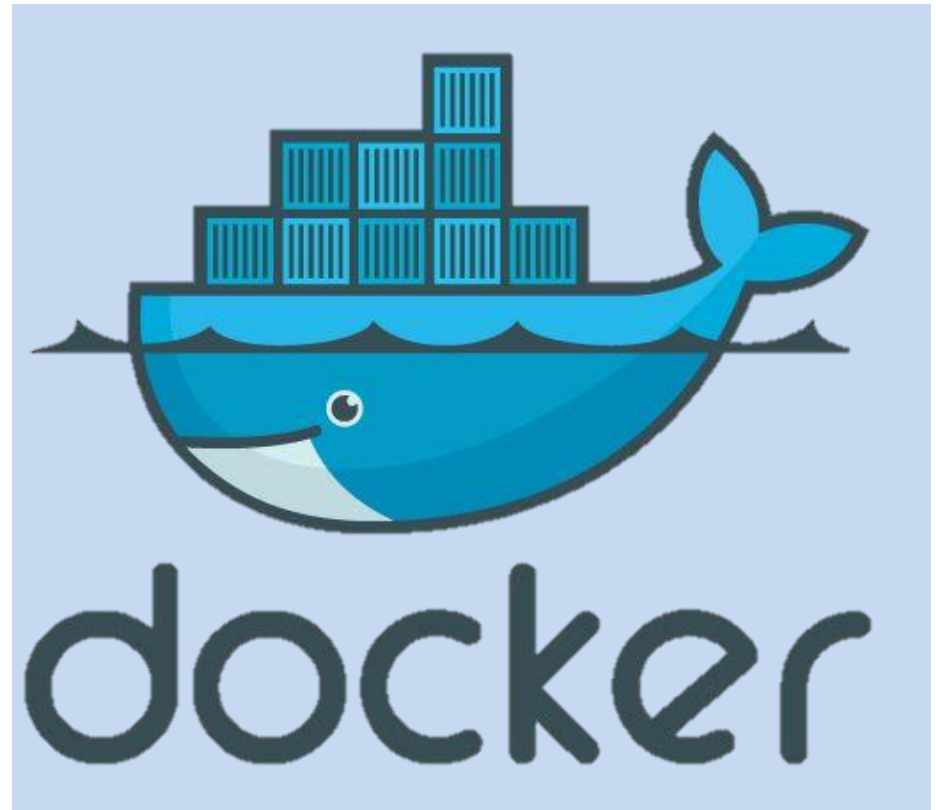
docker

Docker Container vs Virtual Machines

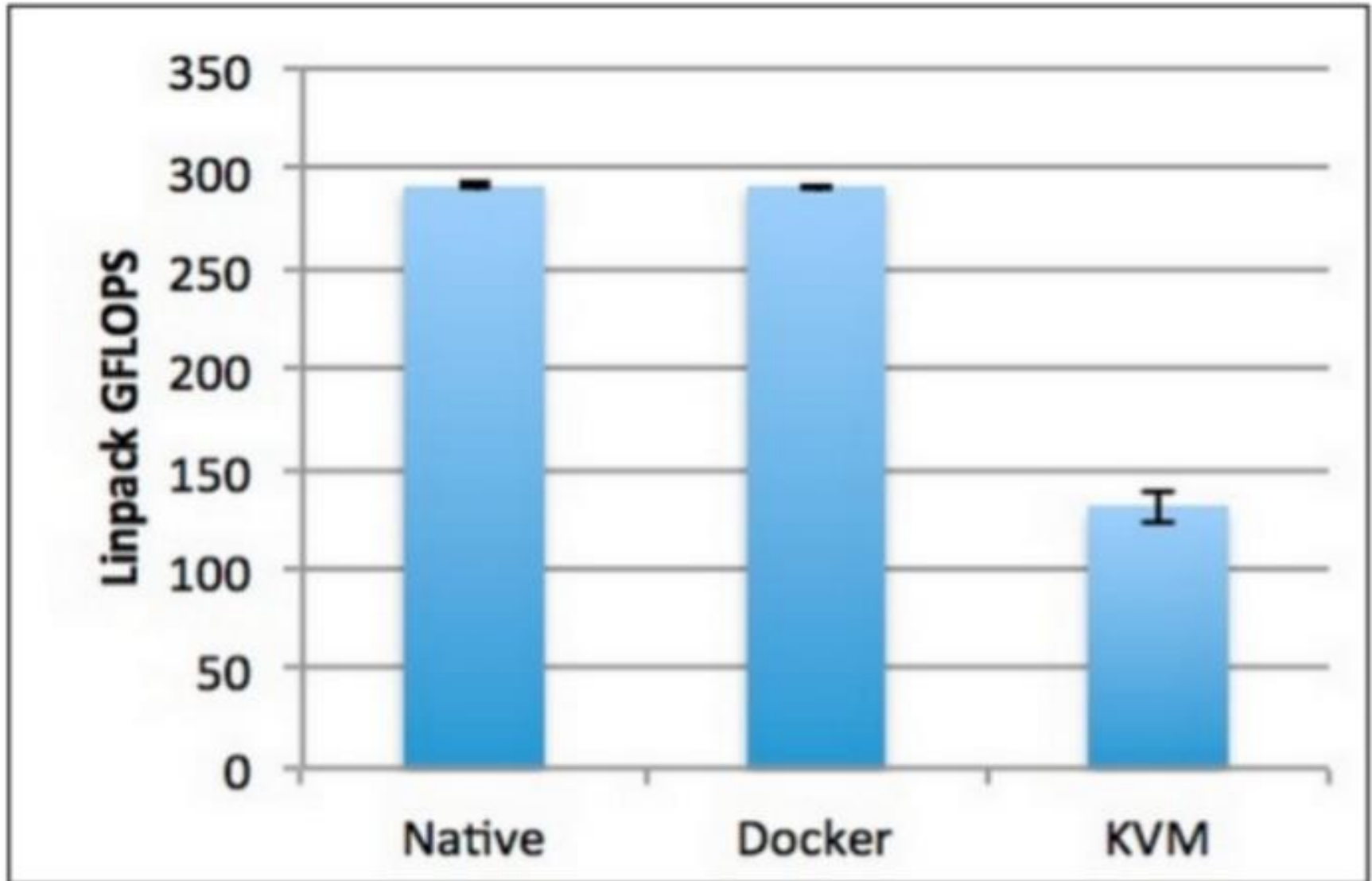


Top Motivations for Docker Containers

- **Build Hybrid Cloud**
 - 45%
- **VMware costs**
 - 44%
- **Testing Group Pressure**
 - 41%



Docker Speed vs Virtual Machine



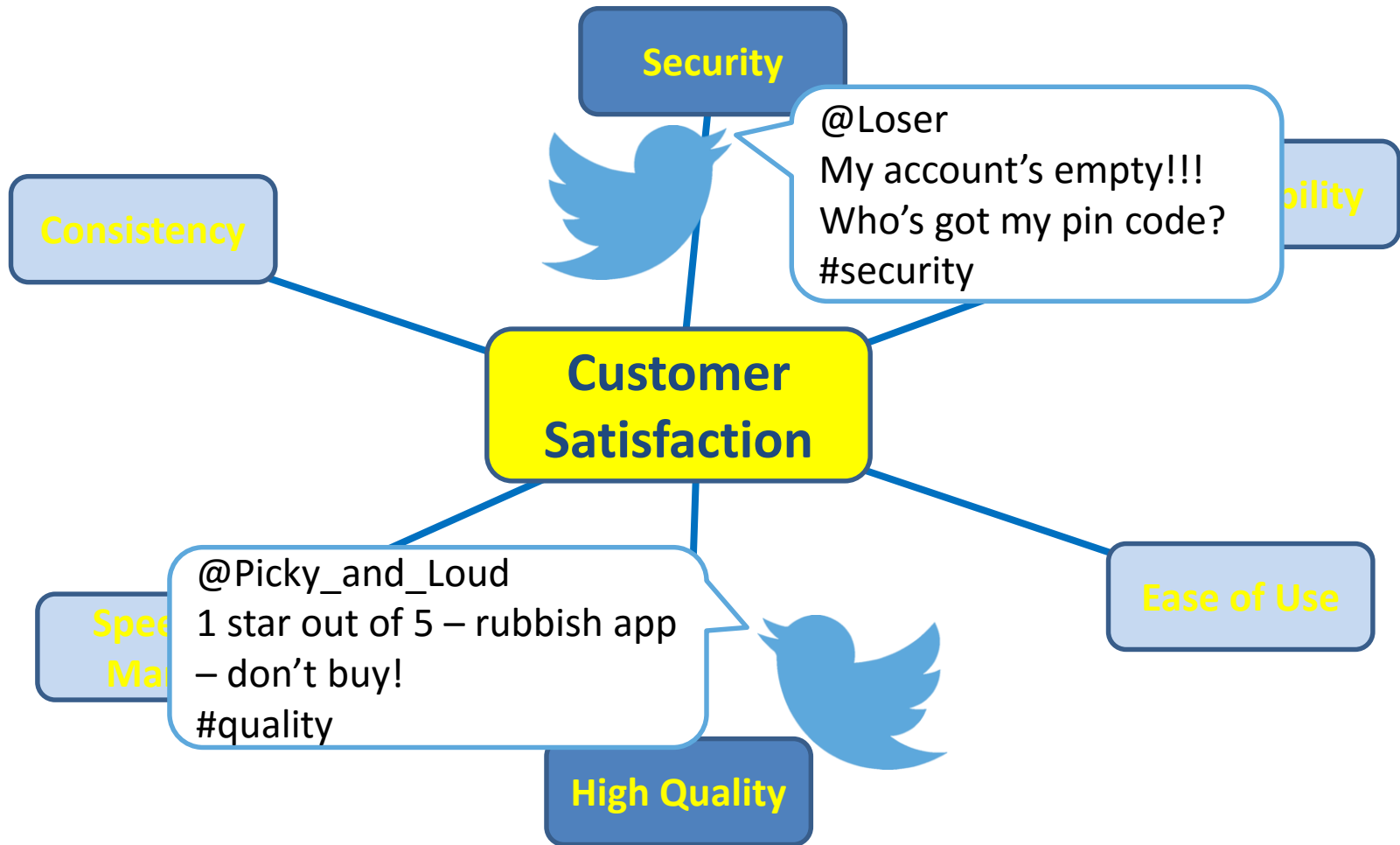
Social Media



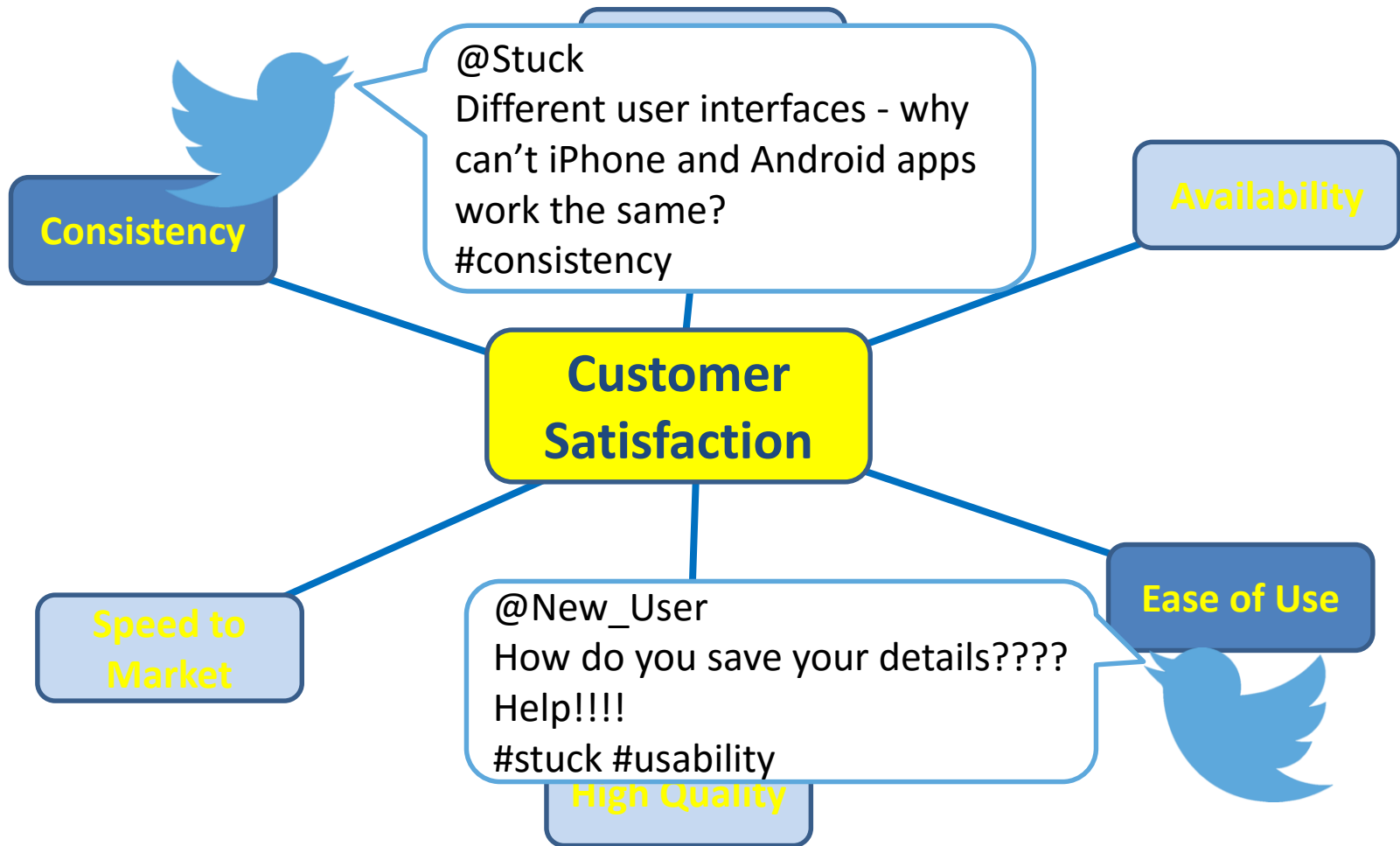
Customer Expectation → Satisfaction



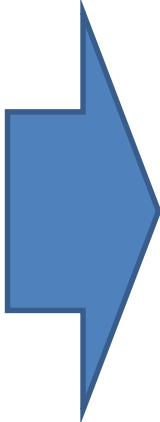
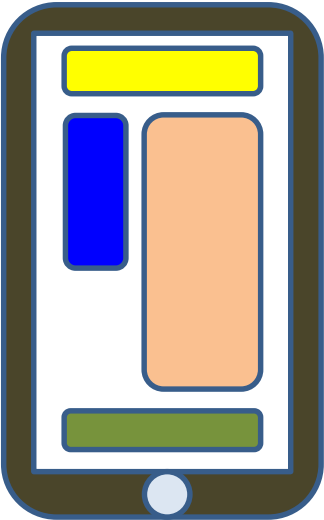
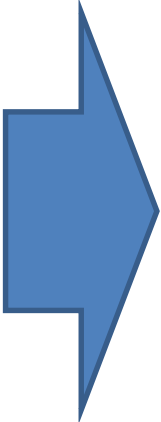
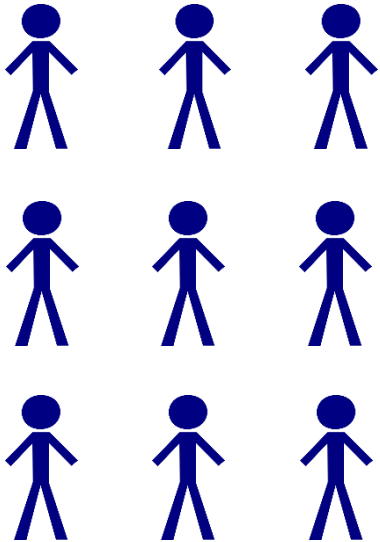
Social Media & Customer Satisfaction



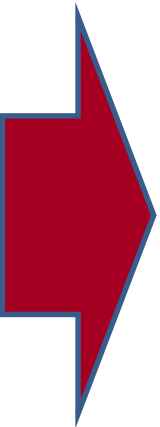
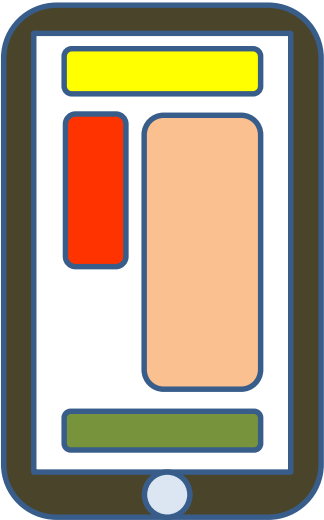
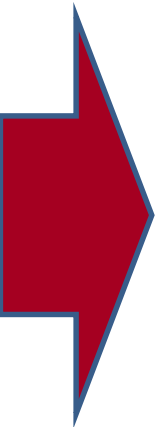
Social Media & Customer Satisfaction



A/B Testing

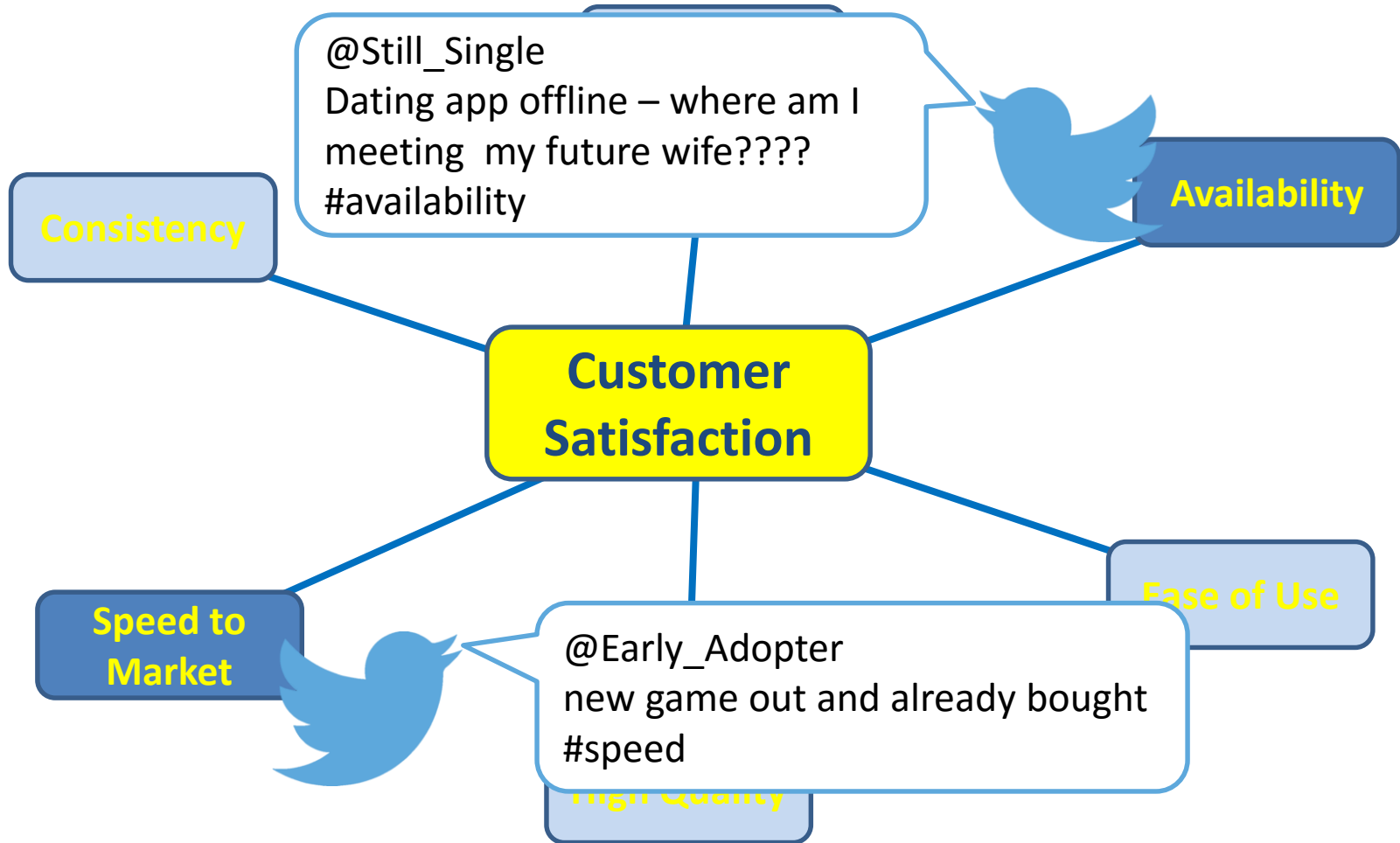


ORIGINAL
BENCHMARK

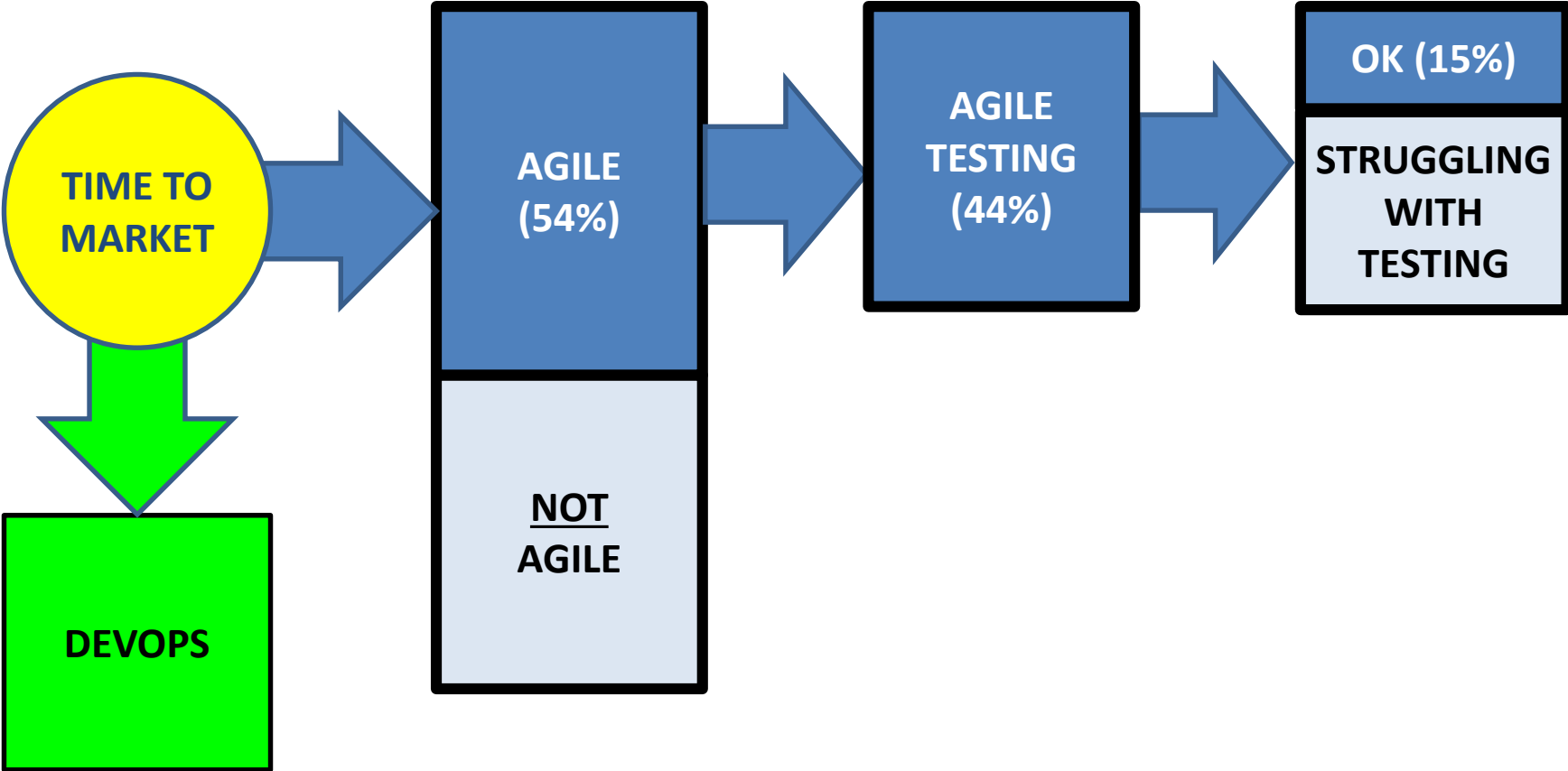


MORE SALES?
HIGHER PRODUCTIVITY?
HAPPIER USERS?

Social Media & Customer Satisfaction



Agile is Growing, but...



Cherry Picking the Best Agile Practices

- **Continuous Integration**
 - fast feedback on check-in
- **Customer Engagement**
 - talk to the customer – all the time!
- **100% Unit Regression Testing**
 - know if you break something
- **Test-driven Development**
 - assured 100% coverage
- **Behaviour-Driven Development**
 - automated acceptance testing
- **Continuous Delivery/Deployment**
 - and in production with DevOps

**THESE TWO ARE
'MUST-HAVES'**



Conclusions

- **Digital Disruption** & **Technology Enablers**
- **Testing Budgets** & **Testing Centres of Excellence**
- **Mobile** & **Crowd Testing**
- **Big Data** & **Fuzz Testing**
- **Data Analytics** & **Model-Based Testing**
- **Cloud** & **Chaos Monkeys**
- **Virtualization** & **Containers**
- **Social Media** & **A/B Testing**
- **Agile** & **Continuous Integration**

Thank you for listening 😊

Any Questions?

Credits/References

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