2015 **SSTC**

Seoul International
Software
Testing
Conference

Testing Trends
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STA STEN CONKRIT

2015 **SSTC**

Seoul International
Software
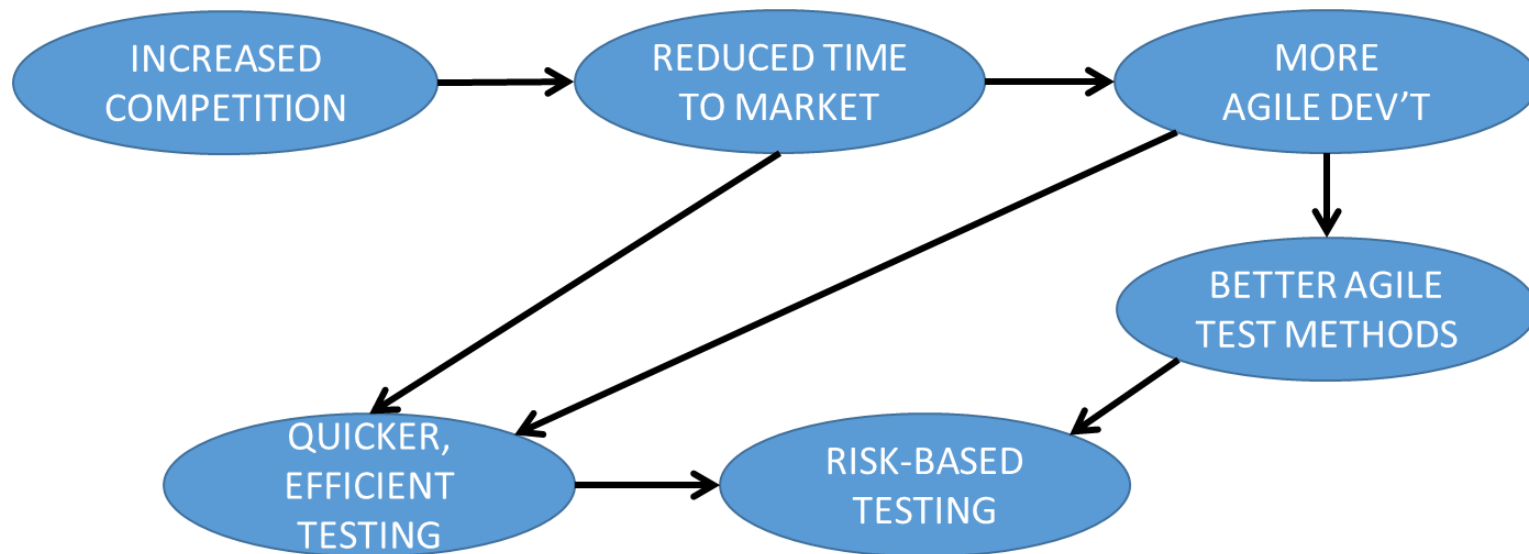Testing
Conference

Contents

Agile

Internet of Things

Risk-Based Testing & Standards

Crowd Testing

Gamification

Conclusions

Agile & Testing – Still Some Way to Go

```
INCREASED          →    REDUCED TIME      →    MORE
COMPETITION             TO MARKET              AGILE DEV'T
                                                   │
                                                   ▼
                                              BETTER AGILE
                                              TEST METHODS

QUICKER,           →    RISK-BASED
EFFICIENT               TESTING
TESTING
```

- World Quality Report 2014-15
  - 93% use agile for some projects in some way, but…
  - 36% of testing is done in agile projects
  - 61% feel their agile test approach is wrong

Cherry Picking the Best Agile Practices

- Continuous Integration
  - fast feedback on check-in
- 100% Unit Regression Testing
  - know if you break something
- Customer Engagement
  - talk to the customer – all the time!

THESE THREE ARE 'MUST-HAVES'

- Test-driven Development
  - assured 100% coverage
- Continuous Deployment
  - try it for production in DevOps

Evolution of the IoT (Internet of Things)

2000
WWW

2015
Mobile

2020
Internet of Things

~360 Million Users

~10 Billion Phones

~212 Billion 'Things'
(up to US$5 Trillion)

Connected People

Connected People
& Locations

Connected Everything

Internet of Things – A Simple Model
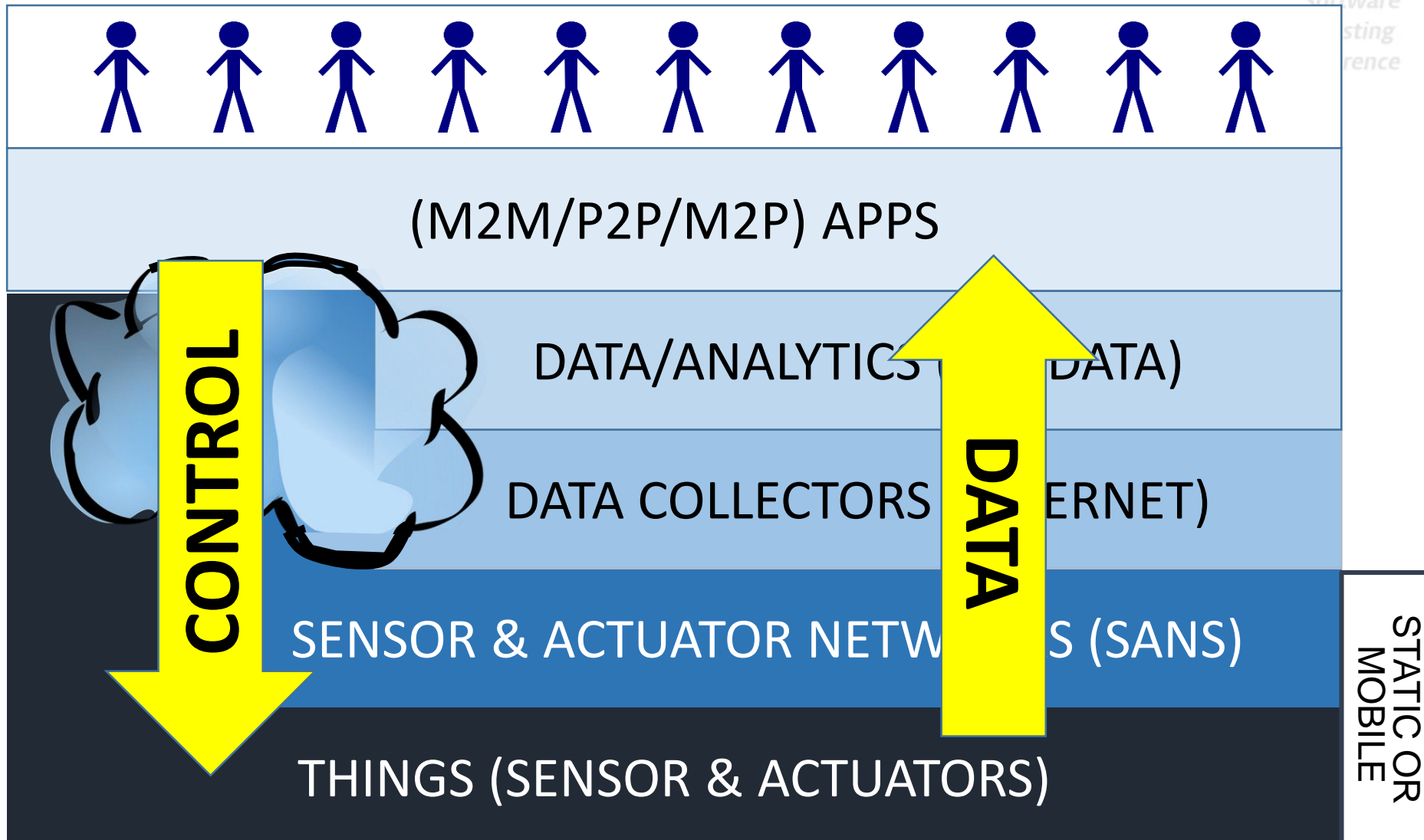
(M2M/P2P/M2P) APPS

DATA/ANALYTICS (BIG DATA)

DATA COLLECTORS (INTERNET)

SENSOR & ACTUATOR NETWORKS (SANS)

THINGS (SENSOR & ACTUATORS)

STATIC OR MOBILE

Internet of Things – Data & Control

(M2M/P2P/M2P) APPS

CONTROL

DATA/ANALYTICS (BIG DATA)

DATA COLLECTORS (INTERNET)

DATA

SENSOR & ACTUATOR NETWORKS (SANS)

THINGS (SENSOR & ACTUATORS)

STATIC OR MOBILE

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IoT – Certified Things & SANS

The testing of individual 'Things' and 'SANS' is the responsibility of the suppliers – they should meet defined interface standards with corresponding certification.
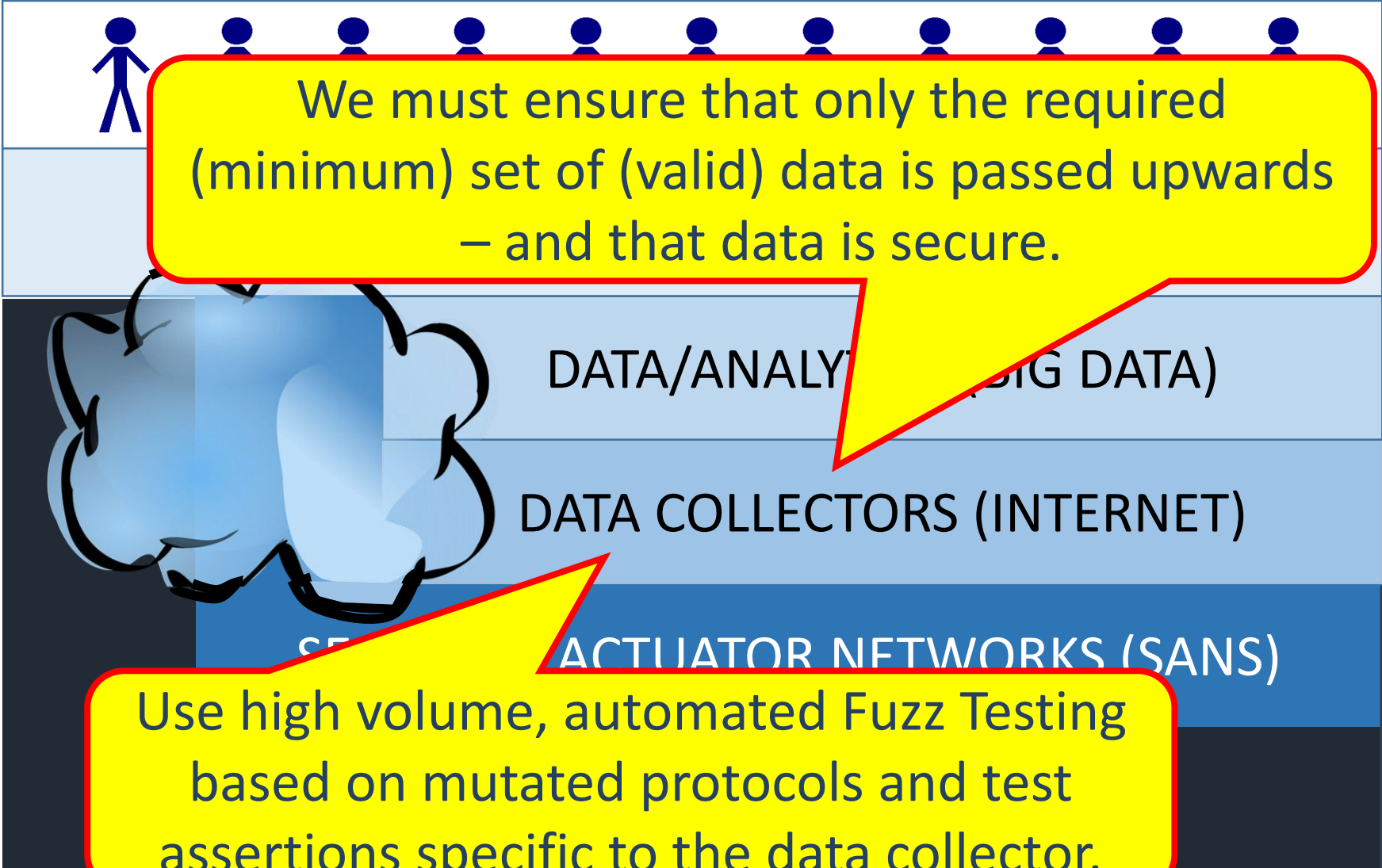
DATA COLLECTOR (INTERNET)

SENSOR & ACTUATOR NETWORKS (SANS)

THINGS (SENSOR & ACTUATORS)

STATIC OR MOBILE

Internet of Things – Fuzz Testing

We must ensure that only the required (minimum) set of (valid) data is passed upwards – and that data is secure.

DATA/ANALYTICS (BIG DATA)

DATA COLLECTORS (INTERNET)

SENSOR-ACTUATOR NETWORKS (SANS)

Use high volume, automated Fuzz Testing based on mutated protocols and test assertions specific to the data collector.

STATIC OR MOBILE

Big Data – Test Data = Real Data?

(M2M/P2P/M2P) APPS

DATA/ANALYTICS (BIG DATA)

Testers of Apps that are dependent on Big Data (especially real-time data) may find the creation of test data sets impractical and be forced to use real data, potentially opening up problems with data privacy.

STATIC OR

IoT – Analytics & model-based testing

For complex Apps based on data analytics we will need to build system models as the basis of model-based testing.
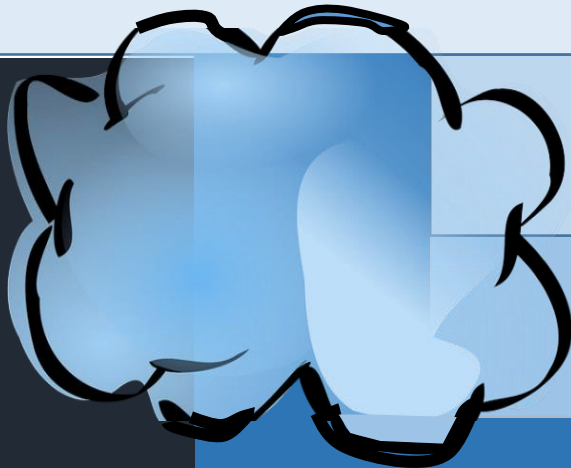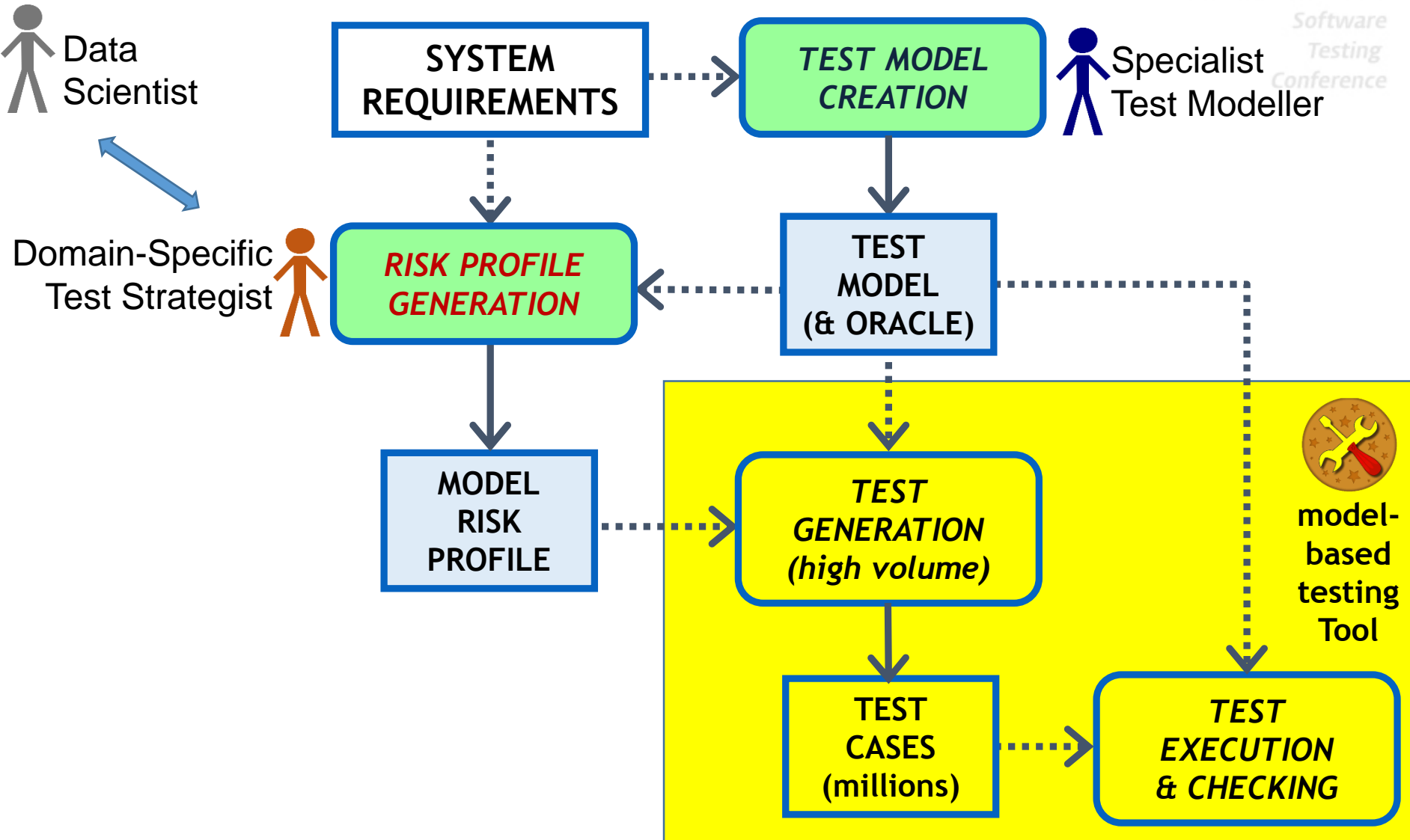
(M2M / P2P / M2P) AI

DATA/ANALYTICS (BIG DATA)

DATA COLLECTORS (INTERNET)

SENSOR & ACTUATOR NETWORKS (SANS)

THINGS (SENSOR & ACTUATORS)

STATIC OR MOBILE

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Risk-Based Model-Based Testing for Big Data

Risk-Based Testing (and Standards)

- Risk-Based Testing IS about generating a far more cost-effective test strategy that saves money and maintains quality

- Risk-Based Testing IS NOT about prioritization and an excuse to not test some features

HIGH RISK → HIGH RISK ⇨ MORE TESTING → More Testing

RISK-BASED TESTING ➜ SAME QUALITY & LOWER COSTS

LOW RISK → LOW RISK ⇨ LESS TESTING → Less Testing

ISO IEC IEEE

29119 Standards

Internet of Things – Release Testing

(M2M/P2P/M2P) APPS

A/B Testing may become the normal pre-release approach for non-critical applications, with users unaware that they are part of a test

SENSOR & ACTUATOR NETWORKS (SANS)

THINGS (SENSOR & ACTUATORS)

STATIC OR MOBILE

Internet of Things – End User Testing
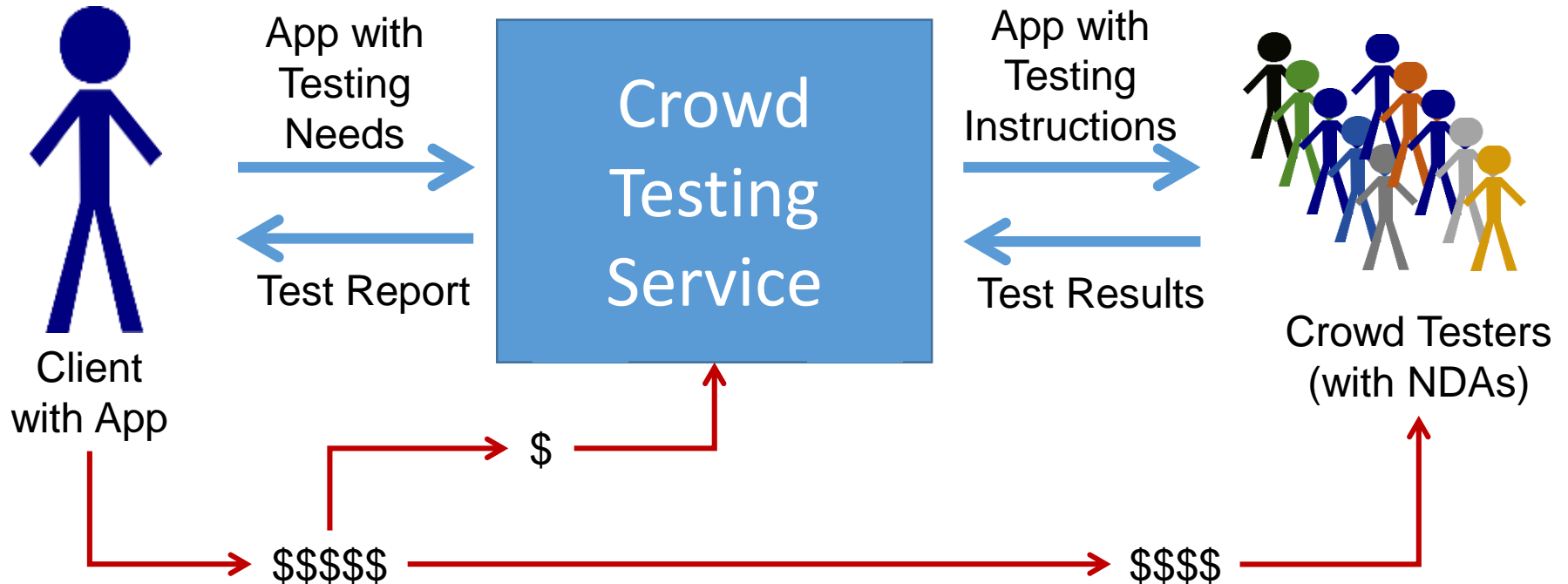
(M2M/P2P/M2P) APPS

DATA/ANALYTICS (BIG DATA)

For complex P2P and M2P Apps the User Testing will require such a variety of 'test' environments & users that it will be beyond the internal capabilities of most test organizations…hence crowd testing

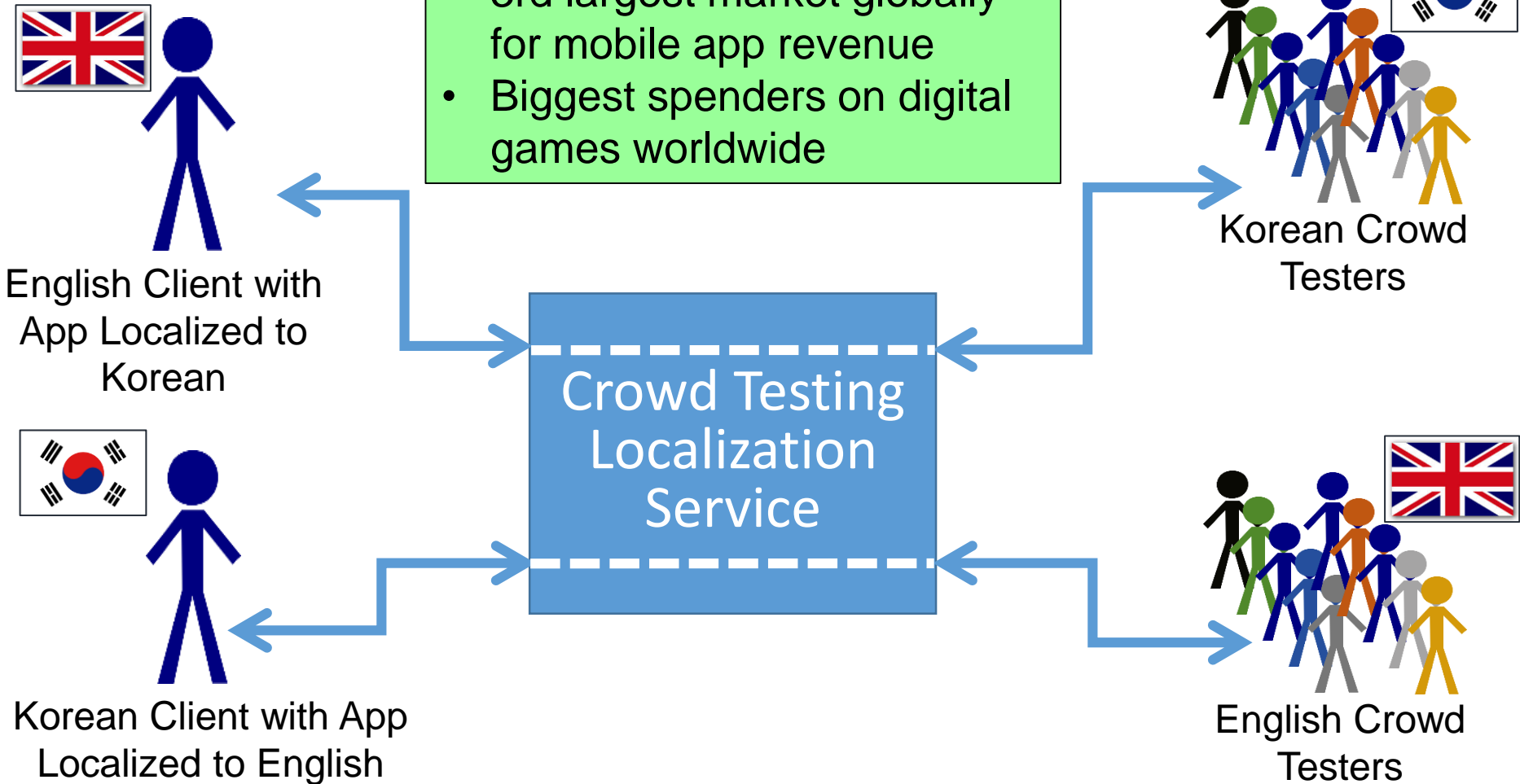THINGS (SENSOR & ACTUATORS)

STATIC OR MOBILE

Crowd Testing

Client with App

App with Testing Needs →

← Test Report

Crowd Testing Service

App with Testing Instructions →

← Test Results

Crowd Testers (with NDAs)

$

$$$$$ → $$$$

Crowd Testing & Localization

Why Localize to Korea?
- 3rd largest market globally for mobile app revenue
- Biggest spenders on digital games worldwide

English Client with App Localized to Korean

Korean Client with App Localized to English

Crowd Testing Localization Service

Korean Crowd Testers

English Crowd Testers
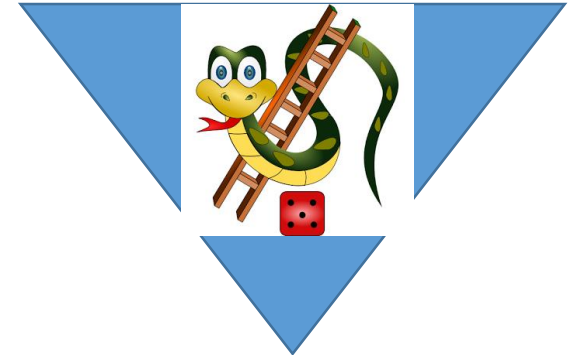
Gamification of Testing

Rewards

- Hidden Treasures
- Higher Coverage
- Coverage Measures

Scoring

- Measuring Progress
- Against tasks or others
- Special Challenge
- Completion Bonus

Competition

- League Tables
- Peer Pressure

Virtual Testing

- Testing in Games and Virtual Worlds
- User Interface Testing

Fast Feedback

- Exploratory Testing
- Validating Defects

Teams

- Encouragement
- Sharing Skills

Conclusions

- Agile
  - steal the best practices
- Internet of Things
  - the next BIG thing
- Risk-Based Testing & Standards
  - more important as budgets rise and timescales shrink
- Crowd Testing
  - Mobile apps, localization and home-based testing
- Gamification
  - Effective tester motivation

Thank You

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