**Specialist Group in Software Testing**

# THE TESTER

## SIGiST Spring Conference
## Tuesday 15<sup>th</sup> March 2016

## 56

**IN THIS ISSUE**

### From the Editor

Welcome to the SIGiST and the first edition of The Tester for 2016.

What a programme we have for you in 2016! Check out the invitation from our Programme Secretary on page 24. We have listened to attendee's feedback over the last year and are planning conferences that will get you infused with Testing! Starting with March, four international speakers and a plenary workshop: Lee Copeland presenting the opening keynote, and Alan Richardson presenting the closing keynote. In between, and for most of the day, is a workshop for everyone to attend presented by Lisa Crispin and Emma Armstrong on How to Improve your Communication as a Tester. Also, sign up for a fiffteen minute data collection research slot on improving the Testing Process with the University of Malta!

We are always looking for speakers / workshops for the conference, and articles for The Tester. If you want to speak check out the SIG website: http://www.bcs.org/category/10880 or contact me if you want to become a published author.

Phill Isles
The Tester Editor
phill.isles@bcs.org

### Conference Booking Instructions

To register online, please use the link below, or scan the QR code with your smart device. Please note the BCS booking system accepts multiple and third party bookings.

https://events.bcs.org/book/1825/

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# Conference Agenda

**BCS SIGiST – Spring 2016 Conference – Tuesday 15th March 2016**
**BCS 1st Floor, Davidson Building, 5 Southampton Street, London. WC2E 7HA.**

*Be lean, communicate well, push your effectiveness*

| Time | Session | |
|---|---|---|
| 09:25 | *Welcome – Steve Allott (SIGiST Marketing Coordinator)* | |
| 09:30 | Keynote<br>*Lee Copeland*<br>**"The Lean Startup Philosophy and Its Lessons for Testers"** | |
| 10:30 | *Networking Session – Jen Wheeler, Networking Secretary, SIGiST* | |
| 10:45 | Coffee , Tea & Refreshments | |
| Morning | Plenary Workshop | Research sessions by University of Malta team **Informing and Guiding the Testing Process using Human Computer Interaction Techniques** |
| 11:15 | *Lisa Crispin and Emma Armstrong*<br>**"Does my bum look big in this? How to answer yes safely"**<br>***Or…***<br>**"Don't shoot the messenger… How to communicate bad news"**<br><br>Part 1 11:15 to 12:50<br>*Continues after lunch* | |
| 12:50 | Lunch<br>(Vendor presentation 13:10 -13:40) | |
| Afternoon | Plenary Workshop | |
| 13:50 | Workshop continues<br><br>Part 2 13:50 to 15:30 | |
| 15:30 | Coffee , Tea & Refreshments | |
| 16:00 | Keynote<br>*Alan Richardson*<br>**"Push Your Functional Testing Further into Technology and Security"** | |
| 16:50 | *Summary of the day and close - Steve Allott (SIGiST Marketing Coordinator)* | |

The SIGiST committee reserves the right to amend the programme if circumstances deem it necessary.
**The Workshop for this programme is for ALL delegates.**

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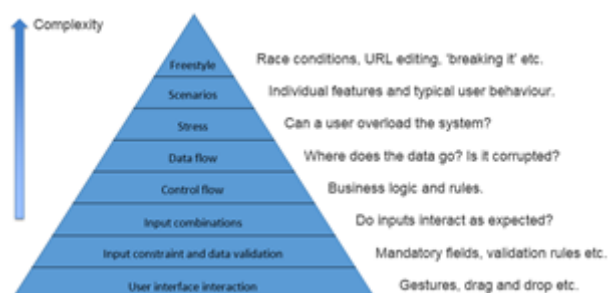
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**Visit our stand at the SIGiST conference
Tuesday 15th March 2016**

# SIGiST Conference Venue

The first SIGiST of 2016 will be held at the BCS London office.
Travel details and location below.

## London office guide

### How to get to the BCS London office

First Floor
The Davidson Building
5 Southampton Street
London WC2E 7HA

Telephone 01793 417666

These area and inset maps have been simplified in the interests of ease of understanding. Not all roads are shown. The inset map below is more accurate.

Access by car is very difficult due to the local one-way system. There are no car parking facilities at BCS London. The nearest car park is located on Drury lane, Parker Street, Parker Mews, London, WC2B 5NT.

The rear door in Exeter Street is to be used for deliveries only and is normally locked.

The main entrance is fully accessible to wheelchair users and should be used by all staff and visitors.

On arrival, report to the Davidson Building Reception who will direct you to the first floor.

### Travel tips from major London stations

**Charing Cross** – 6 minutes walk

**Waterloo** – 12 minutes walk across Waterloo Bridge, or buses 139 or 176 to Stop Ⓒ

**London Bridge** – onward rail link to Charing Cross

**Kings Cross or St Pancras** – Piccadilly Line to Covent Garden tube, or bus 91 to Stop Ⓑ

**Euston** – West End Branch of Northern Line to Charing Cross, or bus 91 to Stop Ⓑ

**Victoria** (rail and coach stations) – Circle Line to Embankment, but the most direct journey is via bus 11 to Stop Ⓐ

**Paddington** – Circle Line to Embankment or Temple, Bakerloo Line to Charing Cross or buses 15 or 23 to Stop Ⓐ

**Liverpool St** – Circle Line to Embankment or Temple, or buses 11 or 23 westbound

**Fenchurch St** – Walk to Tower Hill, then District or Circle to Embankment

# Presentation Abstracts and Speaker Biographies

## *Opening Keynote*

## Lee Copeland, Techwell

"The Lean Startup Philosophy and
Its Lessons for Testers"

The statistics are dismal. Mostly failures… Even though magazines, newspapers, blogs, and even movies tell stories of successful entrepreneurs most **startups** fail. Can testers learn from this?

Eric Ries was an entrepreneur with a history of startup failures under his belt. In 2011 he published The Lean Startup and revolutionized the way startups operate. Ries formulated the lean startup process which has these cornerstones: Build-Measure-Learn loop, Minimum Viable Product, Validated Learning, Customer Development, and The One Metric that Matters.

Lee Copeland has found lessons for testers in this lean startup approach. First, the minimum viable product suggests that we should consider a minimal set of tests, not striving for "completeness" at the beginning. This helps us implement the Build-Measure-Learn loop, which is similar to the Test Design-Test Execution-Learning loop of exploratory testing. The idea of customer development suggests that we should identify the different "customers" for our testing to determine which services they would actually like performed. Finally, the One Metric That Matters replaces the dozens of vanity metrics we gather now which don't really measure either the quality of our product or our testing.

Three key points:
- Learn the basic principles of the Lean Startup philosophy
- Discover how these principles apply to software testing
- Evaluate how you can use these ideas to improve your testing

*With more than thirty years of experience as an information systems professional at commercial and non-profit organizations, **Lee Copeland** has held technical and managerial positions in applications development, software testing, and software process improvement. At TechWell Corp., Lee has developed and taught numerous training courses on software development and testing issues, and is a sought-after speaker at software conferences in the United States and abroad. He is the author of the popular reference book, "A Practitioner's Guide to Software Test Design".*

# *Closing Keynote*

## Alan Richardson, Independent Test Consultant

### "Push Your Functional Testing Further into Technology and Security"

As testers we learn how to functionally test systems. We learn to analyse requirements and test 'What' a system should do. We can take our functional testing further. We can test 'How' the system does what it does, by understanding the technology used to build the system. We will find defects and issues that we would otherwise miss. Some of the defects would normally be associated with security testing, but we will find them without learning the techniques used for security testing.

This approach to testing is applicable to any Software Development methodology and doable by any tester. Alan will explain the specific steps he used to learn to test web applications and push his functional testing further. He will provide examples of tools he uses, and why he uses those tools. Alan also describes the thought process used to find the tools so that you can identify tools for your technology stack.

After this talk you will know how to increase the potential that your testing can identify deep system issues, and steps you can immediately take which will push your functional testing further.

Three key points:
- Interact with the system at a deep technological level to find more bugs. Many classified as security bugs and missed by security testing approaches.
- Tools are necessary to observe and manipulate the system, learn about some important web testing tools and how to find new tools for your technology stack.
- These skills are open to anyone prepared to put in the work to learn. Specific steps and approaches are provided as examples for learning to test web systems.

*Alan Richardson has over twenty years of professional IT experience: as a programmer, tester and test manager. Author of two books and several online training courses to help people learn Java, Technical Web Testing and Selenium WebDriver. He works as an independent consultant, helping companies improve their use of automation, agile, and exploratory technical testing. Alan posts his writing and training videos on SeleniumSimplified.com, EvilTester.com, JavaForTesters.com, and CompendiumDev.co.uk.*

## *Three hour Workshop - Plenary session!*
# Lisa Crispin & Emma Armstrong
### "Does my bum look big in this?
### How to answer yes safely"

Communicating effectively is tricky enough in our day-to-day lives, let alone when under the pressure of tight deadlines. As software delivery team members, especially as testers, we often have to communicate negative or difficult messages to others. It's vital that we can learn to do this without destroying people's trust or causing conflict.

Have you ever said something that someone has completely misinterpreted? Most of us work in teams. Although communication seems simple and is something we do every day, a lot of our communication is misunderstood, which can lead to developing the wrong thing!

To be good at most things in life we need to know more about them. In this workshop we will do several exercises together in groups to help us appreciate the complexities of communication. This will help us learn more about what enables us to be effective communicators and help our teams build shared understanding of the features we need to deliver. Learning ways to adapt our communication helps us to understand people and situations better, which helps to create an environment where problem solving and idea creation can thrive. A team which has good, open communication can collaborate towards the right end product. Being a good communicator and being able to resolve any differences means you build the trust and respect of your team that you need to be able to do your job well.

During the workshop we will do exercises around listening, following instructions, communicating and introduce techniques such as brain writing, and affinity mapping.  We will then look at how this communication relates to our day to day lives within the work place.

The hands-on session will:
- look at all the ways we communicate daily, then focus on the key communications of a test engineer and ways to do this well.
- look at the information testing can provide and ways to communicate that information so that it is received well.
- identify key skills a team needs, which is even more key as a tester helping to deliver quality.
- look at ways to build communication skills within common meetings.

*Emma Armstrong is a test engineer, who has been testing software since 2000.  In that time she's carried out both manual and automated testing and had the opportunity to dig into everything from compilers to web applications.  She's worked with most methodologies, gotten to grips with technologies ranging from chipset hardware to UI (and everything in between), managed test teams and is currently working on financial modelling software.  Over the past three years she has been speaking regularly at Agile, developer and tester conferences worldwide.*

*Lisa Crispin is the co-author, with Janet Gregory, of More Agile Testing: Learning Journeys for the Whole Team (2014), Agile Testing: A Practical Guide for Testers and Agile Teams (2009), co-author with Tip House of Extreme Testing (2002).  Lisa was voted by her peers as the Most Influential Agile Testing Professional Person in 2012.  Lisa enjoys working as a tester and sharing her experiences in the agile and testing communities.  Please visit www.lisacrispin.com and www.agiletester.ca for more.*

## *Research Sessions by University of Malta*

# Mark Micallef, Chris Porter, Neil Abela & Daniela Galea

## "Informing and Guiding the Testing Process using Human Computer Interaction Techniques"

The BCS SIGiST has an aim of supporting research in software testing. A team from University of Malta will attend the SIGiST in March, and carry out 15 minute data collection research sessions with SIGiST attendees. These will run in booked slots in parallel with the rest of the day; if you want to participate you will need to book in for a 15 minute slot, then slip out of the main room at the time for your session. The team will report back on the research results at a later SIGiST.  The research team leader, Mark Micallef, provided this explanation of the research:

Software testing is an intensely human activity, despite the industry's ongoing attempts to, as much as possible, propagate automation. However we argue that the future of software testing lies in machines and humans working together to inform and guide the testing process. To this end, we are current investigating two possible research directions. The first involves the use of eye-tracking technology to study strategies adopted by a manual exploratory tester, whilst the second involves the use of EEG data to understand tester perceptions while observing automatically generated test cases, involving both passes and fails.

To support this research effort, techniques from the field of Human Computer Interaction (HCI) are adopted. HCI is an interdisciplinary area of research and practice which has evolved throughout the years by attracting researchers and practitioners from various other disciplines, including cognitive sciences (*e.g.*, human factors and psychology) as well as design and communications.

- We are investigating HCI Techniques to inform and guide the testing process
- We are currently working on two specific projects involving eye-tracking and EEG data
- We will be present at the SIGIST Conference in March 2016 to explain our work and collect data from any willing participants in sessions that last 15 minutes.

*Mark Micallef is a lecturer at the University of Malta, has a Ph.D. in Software Engineering, founder of the PEST Research Lab where he is active in software testing research, and regularly consults for international companies on software testing and process improvement. He has a passion for software testing with over 15 years of industry experience and has a number of publications to his name in the field.*

*Chris Porter is a Lecturer with the Computer Information Systems department at the University of Malta's ICT Faculty. In 2015 he completed his PhD at University College London, following an MSc and BSc in 2008 and 2005 respectively from the University of Malta. His research interests lie in the area of human factors and information security, with particular emphasis on the measurement of potential user reactions to design decisions within the requirements development process. His research has been mainly applied in the public sector, particularly in the design of public facing and enrolment-centric e-services.*

*Neil Abela is a postgraduate student at the University of Malta specialising in Software Testing.  He is currently looking at leveraging HCI techniques to automate web applications testing, with a particular focus on the Oracle Problem.*

*Daniela Galea* is a student at the University of Malta specialising in Software Testing.  She is currently looking at using EEG data obtained from small commercially available devices to mitigate the Oracle Problem.

Read the article that accompanies this Research Session on page 12 below.

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## SIGiST White Paper Scheme

We have set up an area on the BCS website of a searchable repository for white papers and articles on testing and we are looking for contributors. That means you!

Do you have an existing paper you would like to repurpose and make more widely available through the SIGiST website?

- Then please send us the paper with three keywords for searching.

Would you like to write a new paper?

- Please send us the title and abstract together with the three keywords (or phrases)
- We will review the proposal and guide you through the authoring process
- For those who are thinking of speaking at SIGiST then this might be a good way to prepare a talk and get some useful feedback

If you have been thinking of writing or publicising an existing paper then this is the ideal opportunity. Please email your existing paper (with keywords) or your proposal to The Tester Editor, phill.isles@bcs.org

Past articles from The Tester will slowly be added to the repository as well.

Follow this link to the repository: http://www.bcs.org/category/18128

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## Write an article

We are always on the lookout for new content, so if you have a testing story you would like to share, a test technique you would like to evangelise or testing research you would like to publish, then The Tester is the place to do it. Simply email the Editor on phill.isles@bcs.org

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# SIGiST December 2015 Conference Sponsor



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UST Global were the sponsors of the Winter SIGiST conference in December 2015.  The SIGiST committee would like to thank them for their support.  Please see their article "Test Environment Management" later in this edition of The Tester.

# HCI – The Tester's New Sidekick?

## Mark Micallef and Chris Porter,
## University of Malta

Researchers at the University of Malta outline their work on combining HCI with software testing and call for research volunteers from attendees of the upcoming SIGiST conference.

## Abstract

Software testing is an intensely human activity requiring domain expertise, creativity and discipline in order to be done effectively.  The industry has spent the past two decades trying to move towards a vision whereby testing is mostly automated with the human tester having a significantly reduced scope.  However, even the staunchest proponents of test automation today admit that the role of test automation consists mainly of repeating that which the human tester has already done over successive releases of the same software product.  Does this scenario spell the end of the road for significant advances in test automation?  In the field of software testing research, we seek to understand the complex processes and interactions between testers and the system under test; as well as to use this knowledge to influence those same processes.  At the University of Malta, we have been investigating a hypothesis that there is a middle-of-the-road approach in which human testers and automation can work hand-in-hand in order to achieve new synergies.  We think that this can be achieved through the use of Human Computer Interaction (HCI) techniques.

## What is HCI?

Human Computer Interaction (HCI) is an interdisciplinary area of research and practice which has evolved throughout the years by attracting researchers and practitioners from various other disciplines, including cognitive sciences (e.g., human factors and psychology) as well as design and communications.  The field has produced tools and techniques which help requirements engineers, system designers and software developers steer their activities towards the production of usable and effective systems while encouraging positive user experiences.  Whilst the Encyclopaedia of HCI published by the Interaction Design Foundation boasts 52 chapters full of HCI tools and techniques, within the scope of this article we list four main developments of relevance to our discussion:

1. **Persona Development** aims to develop detailed representations of the users of a system or other persons of interest, in our case software testers.
2. **Eye Tracking / Eye Gaze Analysis** is a technique which uses specialised equipment to accurately record a user's interaction with a system-under-test.
3. **Concurrent and Reflective Think-Aloud (CTA/RTA)** are two techniques whereby participants are asked to verbalise their thoughts and actions during (in the case of CTA) and after (in the case of RTA) the performance of a task.  For example, a tester might state that she is going to "focus on the currency conversion mechanism because it has caused problems in the past".  This provides researchers with a richer knowledgebase when analysing data from sessions.
4. **Brain-Computer Interface** refers to a field of research that explores direct communication pathways between a human brain and an external device.  In our

context, we refer to commercially available headbands, which non-intrusively monitor electrical brain activity and send this data to a computer for further analysis – possibly in real time.

These are just four of the scores of tools and techniques that HCI can offer.  In the next section, we discuss how these can help in the world of software testing.

## HCI and Software Testing

The utility of deploying HCI techniques within software engineering has been explored for decades.  When it comes to software testing, HCI has so far been used to compliment non-functional testing such as usability testing or user experience testing.  However, we hypothesise that HCI can also be turned inwards towards the testing process and its participants such that it can help practitioners (1) understand the complex interactions between testers and products and (2) use this understanding to influence these same interactions, nudging them in ways that makes them more effective.

We are currently investigating this hypothesis by trying to answer two exploratory research questions centred on real-world problems.

## Research Question 1:  Is formal training necessary for exploratory software testers?

This question finds it roots in a heated discussion we observed at a SIGIST Conference in 2011 when the new ISO standard for software testing was introduced.  During that event and for months afterwards in various blogs and conferences, the community debated whether or not certifying someone as a tester made her more likely to be effective at her job or not.  One side argued that certified testers would approach testing with discipline and consistency whilst the other argued that much like a driving license does not make one a good driver, a testing certification does not guarantee a good tester.  Furthermore, end-users regularly find and report bugs even though they are not trained as testing professionals.

To examine this scenario further, we started by considering two different types of testers.  Take Carmen and George, two people who are both employed as software testers.  However, whilst George is formally trained and certified, Carmen has no training buy got the job because she is "good at finding bugs".   Since exploratory testing can be carried out by both trained and untrained testers, we start by limiting our investigation to this particular activity.  Our interest is further strengthened since exploratory testing is frequently referred to as ad-hoc testing and suffers from a reputation of delivering inconsistent results depending on the tester executing it.  Despite the fact that there are documented exploratory testing strategies which can be utilised, effectiveness has been shown to be dependent on the tester's knowledge, learning style and even personality.

In our study, we used HCI techniques to develop the two personas (Carmen and George) as well as a protocol for a controlled case study which utilises eye-gaze analysis and think-aloud techniques to determine what exploratory testing strategy is being used (consciously or unconsciously) by a tester at a given time.  We analysed a number of exploratory testing strategies from authors such as Whittaker, Bolton and Bach, and decomposed them into more granular behavioural patterns.  For example, in Whittaker's "Bad Neighbourhood" strategy a tester would focus her attention on functionality in which bugs have already been discovered.  This can be decomposed into behavioural patterns whereby (1) the user discovers a bug and (2) focuses attention of testing in the area where the bug was found.  Of course, there are

variations of this which are also taken into account but the example suffices to demonstrate our approach. By using HCI techniques to detect successive behavioural patterns during a testing session, we could look for sequences of patterns that indicate the use of particular strategies during a testing session. We then developed an online store, purposely injected a number of bugs for testers to find, and executed the study with a cohort of testers evenly split between participants who fit the Carmen persona and those who fit the George persona. This allowed us to answer questions such as "what types of strategies does each persona use?", "what overall combination of strategies does each persona use?", "what types of bugs are likely to be found by which persona?", "what is the ideal composition of a testing team?", and so on. Figure 1 depicts the set up in our usability lab during data collection sessions.
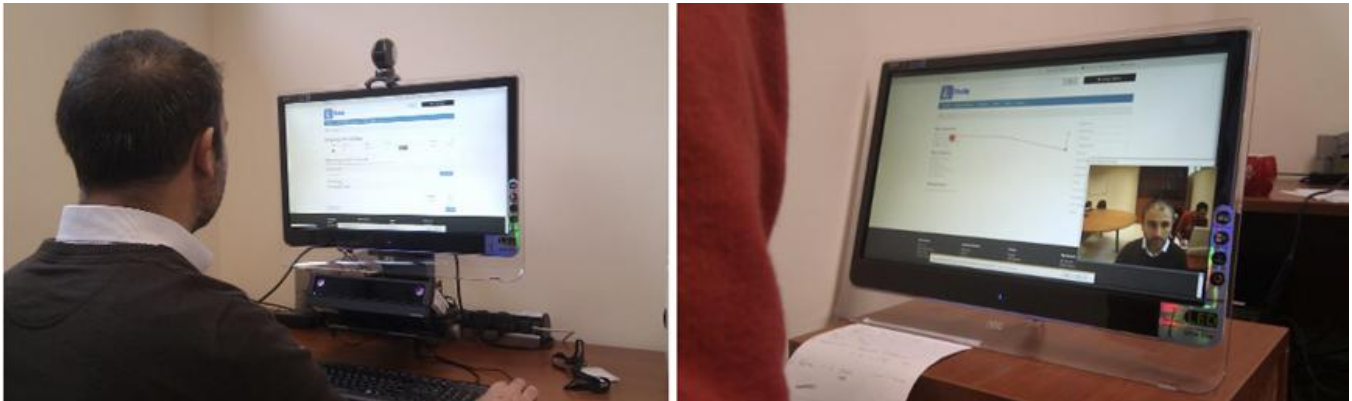


Figure 1 - Our setup with a participant on the left and the observer station on the right

Initial results provided interesting insights with empirical data showing clear distinctions between the Carmen and George persona in terms of utilised strategies, types of bugs found and effectiveness. Since we are still collecting data to reinforce the initial results of this study, we will refrain from elaborating on specific observations but hope to be given the opportunity to do so in a future article on this magazine and possibly at a SIGIST conference.

## Research Question 2:  Can HCI Techniques help mitigate the Oracle Problem?

Automated test case generation techniques have advanced to a state where they can reliably generate interactions with a system-under-test that produce a high level of coverage. However, apart from cases where a set of interactions cause a system to crash, it is very difficult to determine the expected outcome for a given test case that has been generated automatically. This is known as the Oracle Problem. In our second study, we examine the possibility of detecting whether a system has behaved appropriately to a given test case by monitoring a human observer's reactions to watching a test execute. Imagine a scenario whereby a domain expert observes a system being automatically tested whilst wearing a non-intrusive EEG headband[1] and being observed by an eye-tracker. We hypothesise that if we monitor changes in electrical signals in the observer's brain, we would be able to deduce whether the observer perceives that a test case has passed, failed, or is confused by the outcome of that test. By merging this data with information about which area of the screen the tester is looking at during the test (correcting for external off-screen stimuli), we can further guide test case generation to automatically generate tests in areas which are likely to contain bugs. The perceived setup of our study is depicted in Figure 2.

[1]An EEG headband is a device that monitors electrical activity in the brain whilst its user is exposed to certain stimuli.
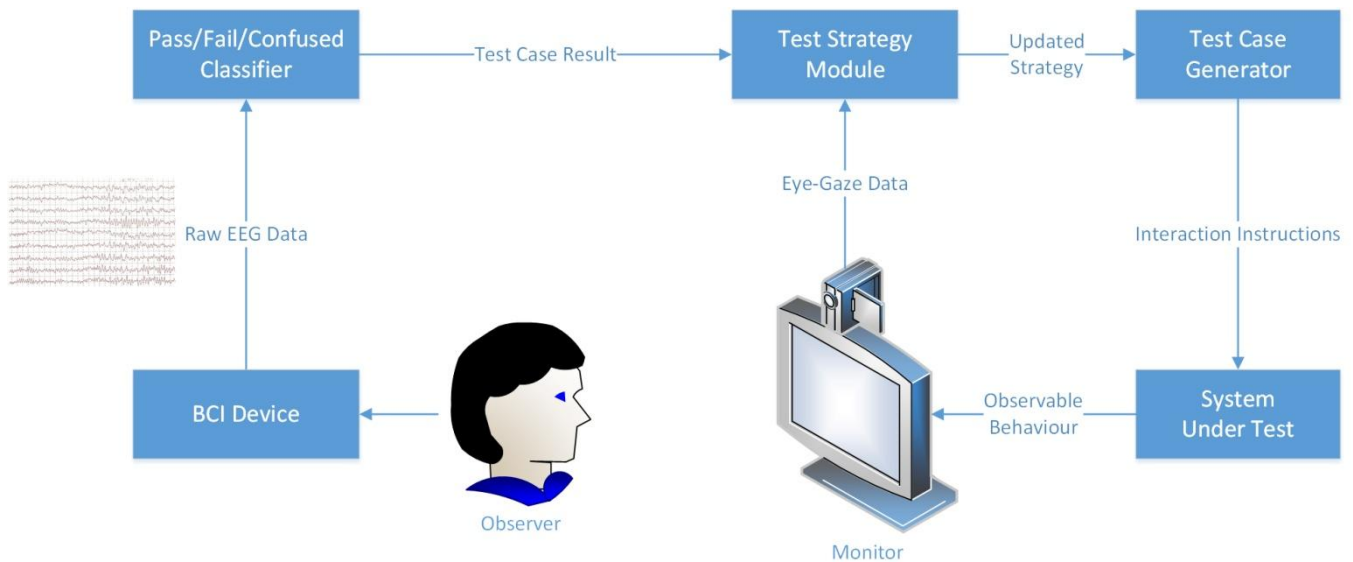
Figure 2 - Perceived setup of study on mitigating the Oracle Problem using HCI Techniques

This study is still in its infancy and we are currently collecting EEG data from volunteers with a view of devising user models and supporting algorithms to determine a pass/fail/confused outcome given a stream of EEG data.

## Conclusion

In this article we outlined ways in which we believe that the field of HCI is an untapped resource that can greatly improve our understanding of, and influence over, the software testing process.   We did so by investigating two research questions utilising only four of the scores of techniques that the field has to offer.  One can envisage that the number of interesting questions which can be answered, as well as the number of applications in which these and other techniques can be applied can only grow if studies show this to be a promising area of research.   We believe that HCI techniques really do have the potential of becoming the Tester's new sidekick.

## How can you help?

Our researchers will be present at the SIGiST Conference on 15th March 2016 and will be collecting data from volunteers throughout the day.  Participation should only take 15-20 minutes of your time and we promise to come back to SIGiST to present the results when we have them.  If you are attending the SIGiST conference and are interested in participating in our study, please send an e-mail to mark.micallef@um.edu.mt

# Mind maps: A killer way to increase your test coverage

## Prashant Hegde,
## Razorthink Software

### What is a mind map?

A mind map is a diagram used to visually organize information. It can be called a visual thinking tool. A mind map allows complex information to be presented in a simplified visual form. A mind map is created around a single concept. The concept is represented as an image in the centre to which the associated ideas are added. Major ideas are connected directly to the central concept, and other ideas branch out from those.

Mind maps are great for note taking, planning, studying, brainstorming, *etc*. The term 'mind map' was first used by Tony Buzan in 1974. I drew my first mind map when I was in school. I preferred mind mapping over text notes and it proved to be a great aid to revise and recall the concepts quickly. This is because the information in mind map is structured in a way that mirrors exactly how the brain functions - in a radiant rather than linear manner. A Mind Map literally 'maps' out your thoughts, using associations, connections and triggers to stimulate further ideas.

### How to draw a mind map

Tony Buzan the "Father of Mind Mapping" suggests the steps below:

**1. Start in the centre of a page.**

Why? Because starting in the centre, gives your brain freedom to spread out in all directions and to express itself more freely and naturally.

**2. Use an IMAGE or PICTURE for your central idea.**

Why? Because an image is worth a thousand words and helps you use your Imagination. A central image is more interesting, keeps you focused, helps you concentrate, and gives your Brain more of a buzz!

**3. Use COLOURS throughout.**

Why? Because colours are as exciting to your Brain as are images. Colour adds extra vibrancy and life to your mind map, adds tremendous energy to your Creative Thinking, and is fun!

**4. CONNECT your MAIN BRANCHES to the central image and connect your second and third level branches to the first and second levels, *etc.***

Why? Because your Brain works by association. It likes to link two (or three, or four) things together. If you connect the branches, you will understand and remember a lot more easily.

**5. Make your branches CURVED rather than straight-lined.**

Why? Because having nothing but straight lines is boring to your Brain.

**6. Use ONE KEY WORD PER LINE.**

Why? Because single keywords give your mind map more power and flexibility.

**7. Use IMAGES throughout.**

Why? Because each image, like the central image, is also worth a thousand words. So if you have only 10 images in your mind map, it's already the equal of 10,000 words of notes!

**PRO TIPS**
- If a mind map is getting too big or complicated try splitting it.
- Do not use long detailed sentences in mind maps. Using one word per line improves clarity and understanding. Using single keywords will make your mind maps more powerful and flexible.
- Develop your own personal style of mind mapping.

## How to use mind mapping techniques in software testing

Mind maps can be used in all the test stages from test planning to test case execution.  They can be used for:

- Test Planning
- Requirement analysis
- Impact analysis
- Task allocation
- Test case design
- Traceability
- Test reporting - Quick test reports

## Test Planning

While test planning, you can draw an initial mind map keeping in mind the list of tasks, schedules, tools, roles, responsibilities, milestones, *etc.* Present the mind map and discuss it with your stakeholders. Modify the mind map if any changes are required. One thing you will love about mind maps is its flexibility to adapt to changes. All you might have to do is to add or remove a node/branch. This flexibility might not happen when you draw on a paper, but mind mapping software assists any changes easily.

The final mind map shows you the scope of testing in one glance. This mind map can be used as a blueprint and later converted into a plan. This ensures that no test activity is missed.
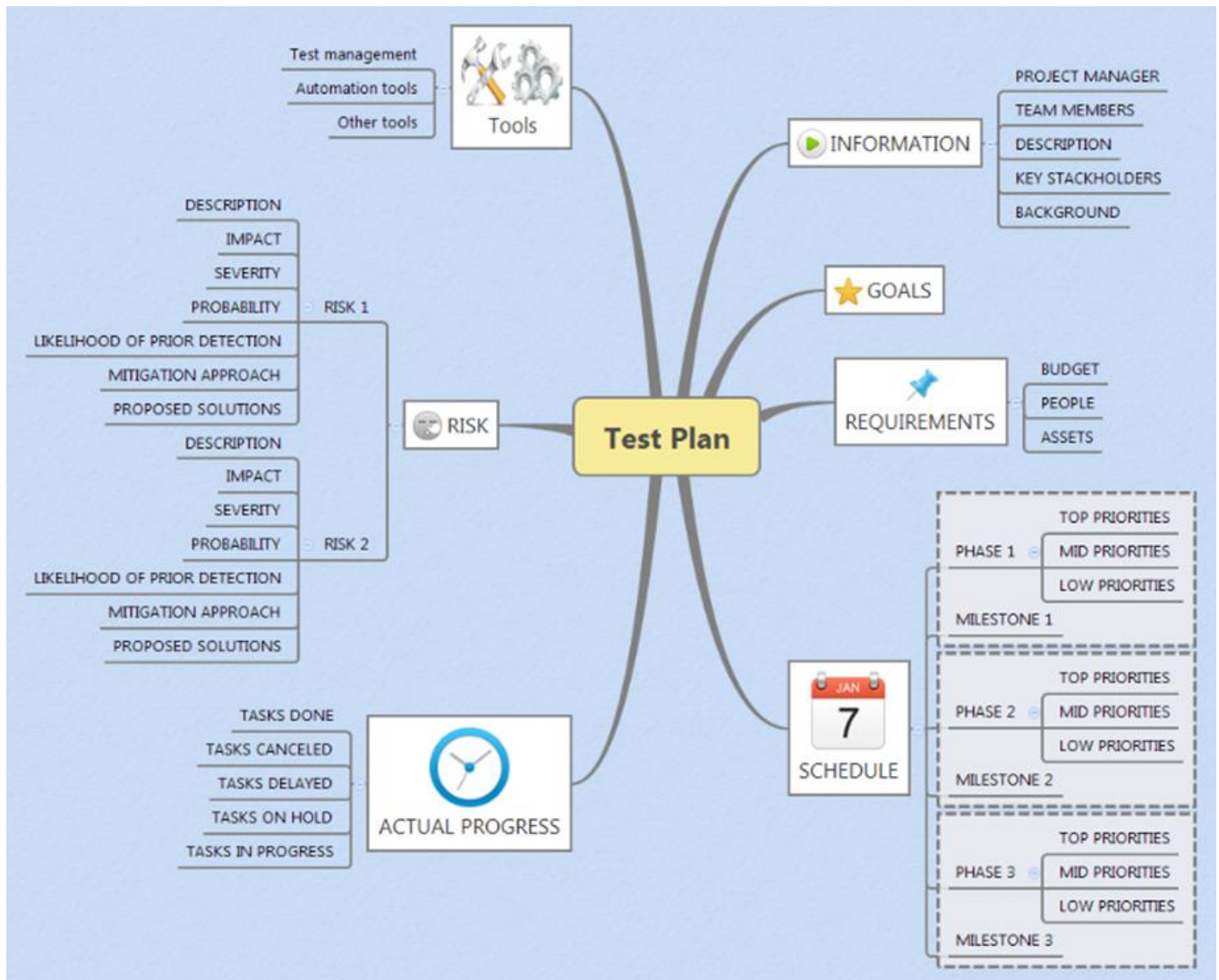


## Test case design

Mind maps are an efficient way of creating lean test cases. It reduces the time required for creating test cases yielding better results. Mind maps are very easy to maintain and are flexible to changing requirements.

Draw branches from every user story / epic and associate all its functionalities as sub-nodes. Start adding test ideas / test case for each functionality.
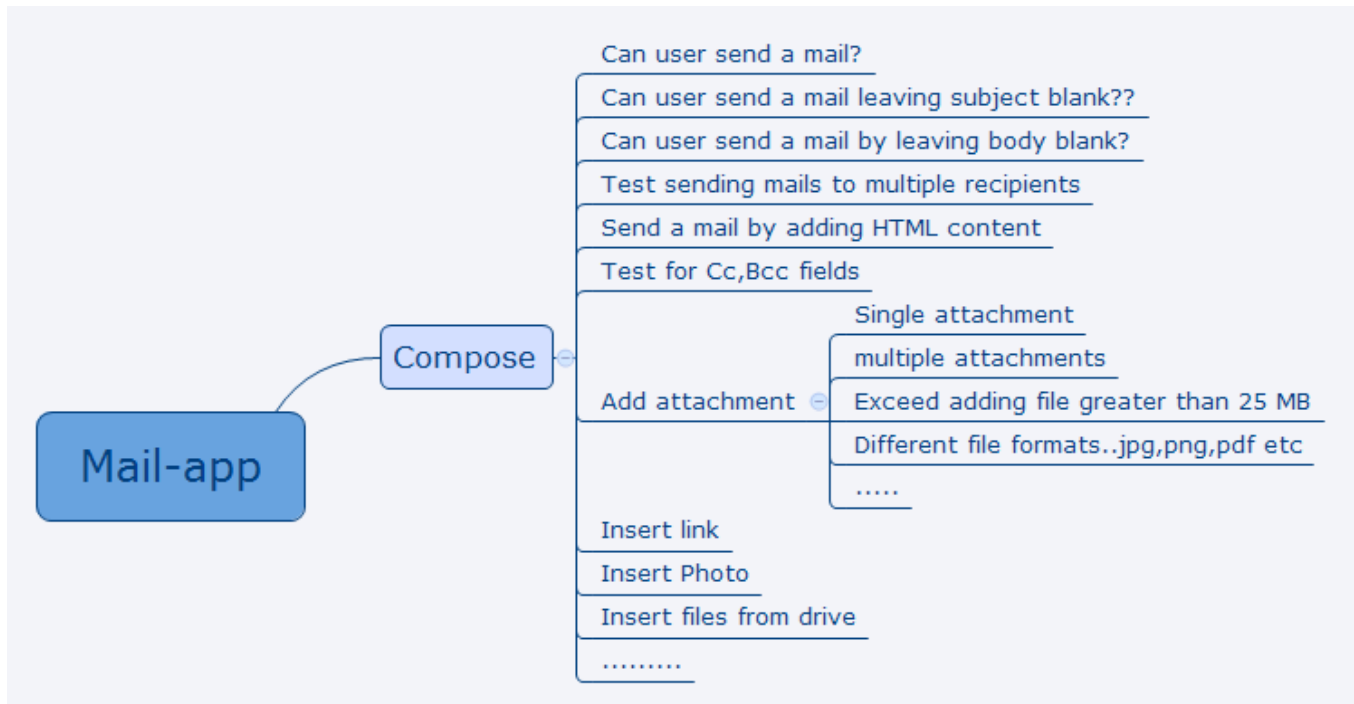
I created a mind map covering test ideas for the major functionality. My team started to expand the mind map by branching out more and more test ideas. We kept adding new nodes when we found unique scenarios that uncovered the bugs during our test sessions. This drastically increased our test coverage. The final mind map can be used as the basis for test case documents or it's cool if it's used as it is.

The good result of mind mapping is that you generate more ideas when drawing them. Collaborative mind mapping with the team gives you the best results.

## Traceability mind map

A traceability matrix is an essential tool for every tester to analyse and improvise the test coverage. You can use a mind map instead of a tabular traceability matrix.
To create a traceability mind map - add nodes of all the Epics. Draw branches from every module and associate all its user stories as subsequent nodes.  Now link the test cases for all functionality.  You can link the requirement number of the test management tool.
This ensures that you have not missed out writing test cases for any user story. This mind map gives you the birds-eye view of your test coverage. You can identify the areas where you need to strengthen your coverage.
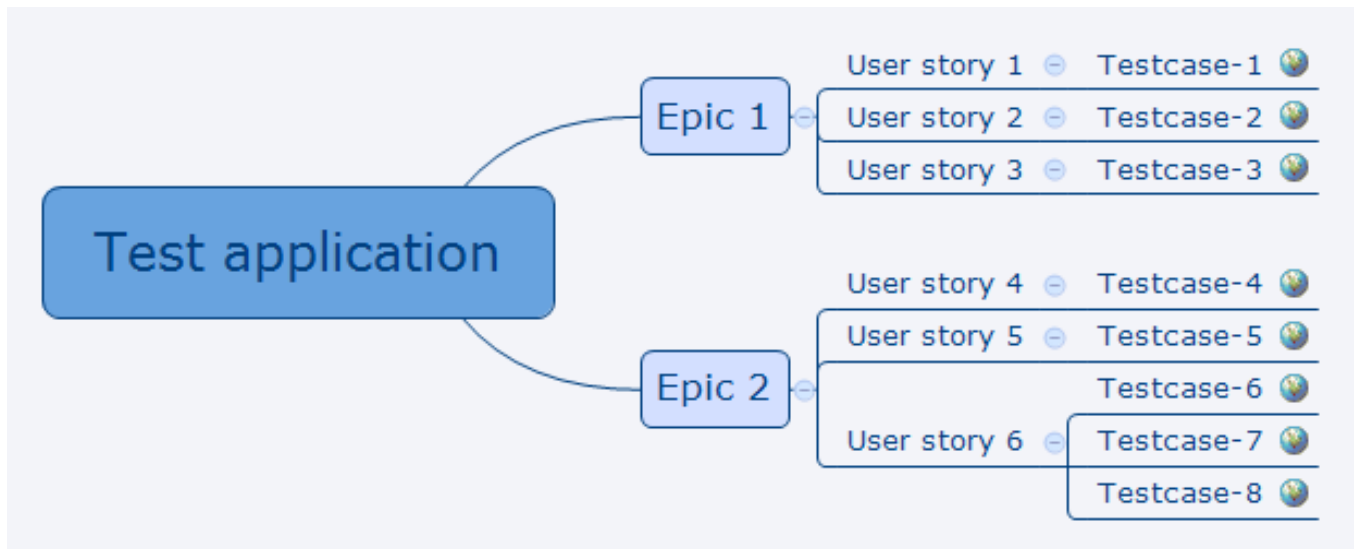
## You can use mind maps anywhere and everywhere!

Below is a mind map for "App store compliance-iOS":

## Tools

There are tons of commercial and open-source tools that let you visualize your ideas as a mind map. I prefer the following tools:

- Xmind(Windows/Mac/Linux)- Probably the most popular and free mind mapping tool.

- Coogle(Web app) - Coogle is a web app that lets your team collaborate and work on a single mind map.

The use of mind maps is getting popular with agile testers and lean test practitioners. When will you start using mind maps?

*Prashant is a passionate tester. He currently works as QA lead in Razorthink Software. He leads a small team and ensures that the products he works on meets the highest standards in tight schedules and deadlines. Prashant is a gamer, a biker, and a writer. He writes a blog on best practices in software testing in his spare time. Follow Prashant at his website -prashanthegde.in*

-------------------------------------------------

## Write an article

We are always on the lookout for new content, so if you have a testing story you would like to share, a test technique you would like to evangelise or testing research you would like to publish, then The Tester is the place to do it. Simply email the Editor on phill.isles@bcs.org
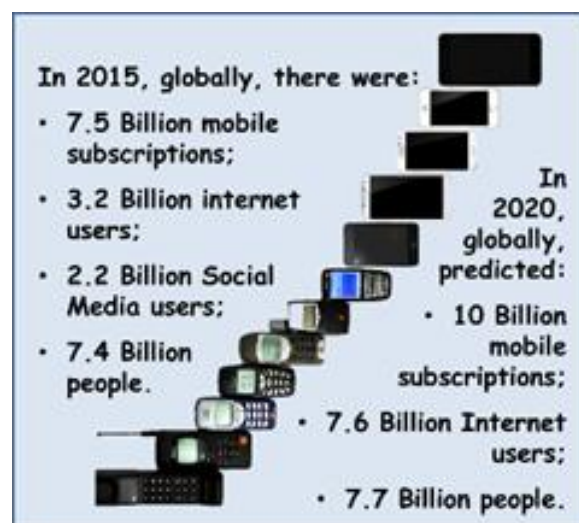
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# Global Trends - Digital Transformation & Testing

## Stuart Reid, STA Consulting & CONKRIT

New technologies such as social media, mobile, the cloud, big data and analytics are changing the way we live our lives - and how businesses fulfil their customers' expectations. Based on these technologies, the digital transformation provides us with the ability to quickly build apps of ever greater functionality and complexity. Businesses cannot afford to ignore this if they want to flourish, or simply survive. Similarly, the testing industry must adapt by addressing the new challenges presented by these technologies and exploiting the opportunities they offer.

## Social Media

Today's users are quite different from those of 15 years ago.  They are not tolerant of frequent failures and poor usability – they have grown to expect secure apps, which are available 24x7, with consistent usability irrespective of the channel used (e.g. desktop, laptop, tablet or phone; in the office, at home or on the train; etc.). If they don't like an app then they discard it and move to another one. What's more, through social media, users can easily tell us what they think of our apps. While this provides app developers with fast feedback, it also means that launching apps of unknown quality is a high-risk business.  Poor reviews affect the 'brand' and today's executives now have 'protecting the corporate image' as their number one testing objective. Testers should understand that safeguarding their company's brand is a major part of their job.



In 2015, globally, there were:

- 7.5 Billion mobile subscriptions;
- 3.2 Billion internet users;
- 2.2 Billion Social Media users;
- 7.4 Billion people.

In 2020, globally, predicted:

- 10 Billion mobile subscriptions;
- 7.6 Billion Internet users;
- 7.7 Billion people.

## Optimizing Testing

Across all technology areas, security is the primary focus for most organizations. For instance, users of the cloud worry that their apps and data are not private, while mobile opens up new channels with many potential security vulnerabilities.  The next highest focus area is performance, because of the need to provide a consistent user experience no matter what channel is being used. Functionality is now the third highest focus area, which highlights a move away from the traditional testing approach of concentrating on functionality, often to the detriment of other non-functional quality attributes.  Businesses are learning that it is better to de-scope functionality while maintaining focus on other quality attributes, rather than delivering lots of features that can be insecure, slow and difficult to use. Testers need to understand and align with this shift by offering the relevant non-functional skills to use alongside those used for traditional functional testing.
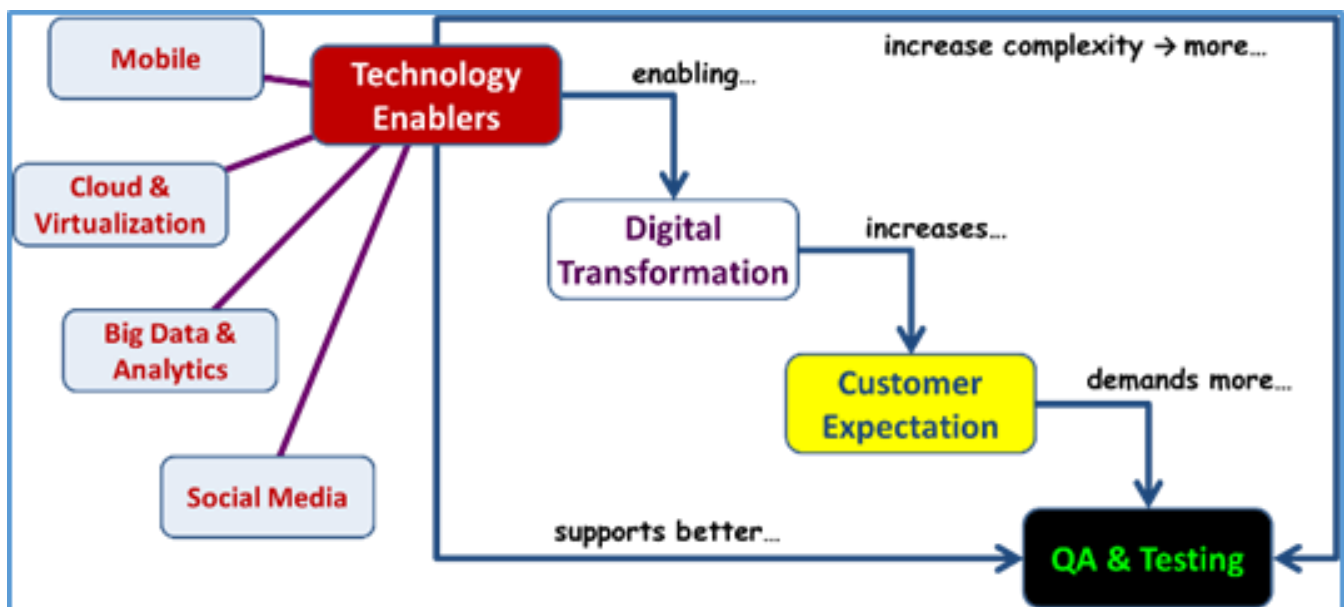


As systems become larger and more complex they require more testing, while users' rising expectations mean that quality levels also need to increase. These two factors are simultaneously driving us to provide better testing. The current trend is to spend more on testing resources; the proportion of IT budget spent on testing increased to 35% in 2015, with a forecast for this to rise to 40% by 2018. However, if more of the budget is spent on testing then there is less available to invest in new technology and for developing innovative products. Rather than spend more on testing, we need to use our current resources more efficiently by both optimizing our testing and exploiting the technology driving the digital transformation to make our testing more effective.

## Cloud Testing

The cloud provides users with access to near unlimited processing power and storage space, and they also have the benefit of an elastic resource which can expand and contract as needed, all of which is maintained by the cloud provider. The global market for the cloud (predicted at $555 Billion in 2020) is huge and the requirement for the testing of cloud-based software (on public, private and hybrid clouds) continues to grow. This is partially offset by the opportunities the cloud provides to support testing. The Software as a Service (SaaS) model

provides access to software testing tools when they are needed – for instance, testers need only pay to use performance testing tools when they use them rather than pay for an annual licence. The Platform as a Service (PaaS) model provides users with access to a virtual platform – allowing testers to purchase the use of virtual test environments (again, only when they are needed). Where the cloud is used as the production environment, there is an added benefit for the testing as then a cloud test environment identical to the production environment can be spun up to support fully-representative system and acceptance testing.

The cloud is also used by performance testers who wish to create realistic loads by creating many (often millions) of virtual users on the cloud and they can even distribute them across different regions to see how a system responds to a distributed user base. Test labs in the cloud can be used to support distributed testing as testers anywhere in the world can then access the same cloud-based test lab.  Another use of the cloud is to provide resources to speed up automated test execution times (typically for regression testing) to provide quicker feedback, for instance by providing a platform for running multiple unit and integration tests in parallel.

## Mobile Testing

Mobile technology is an integral part of the digital transformation. The revenue for mobile services is predicted to be in the region of $1.2 Trillion by 2018, by which time there are expected to be more mobile connections than there are people in the world.  Mobile is both a fast-growing opportunity and a challenge for software testing (two years ago about half of all organizations were performing mobile testing, whereas this figure is now well over 90%).

Most test managers believe that test environments and the availability of devices are their biggest challenges in mobile testing.  The difficulties of managing an internal mobile test lab are numerous, while the alternative of using an external test lab can be expensive.  Although the use of a lab is a necessity to gain initial confidence in the functionality of an app, it rarely addresses the fundamental issue of providing testers with a true hands-on experience. Usability issues, such as using the mobile device on the move, in sunlight, or in a noisy environment cannot be addressed in the lab.  Also, if tests are only performed in the lab then performance issues due to different connections and carriers are likely to be missed.
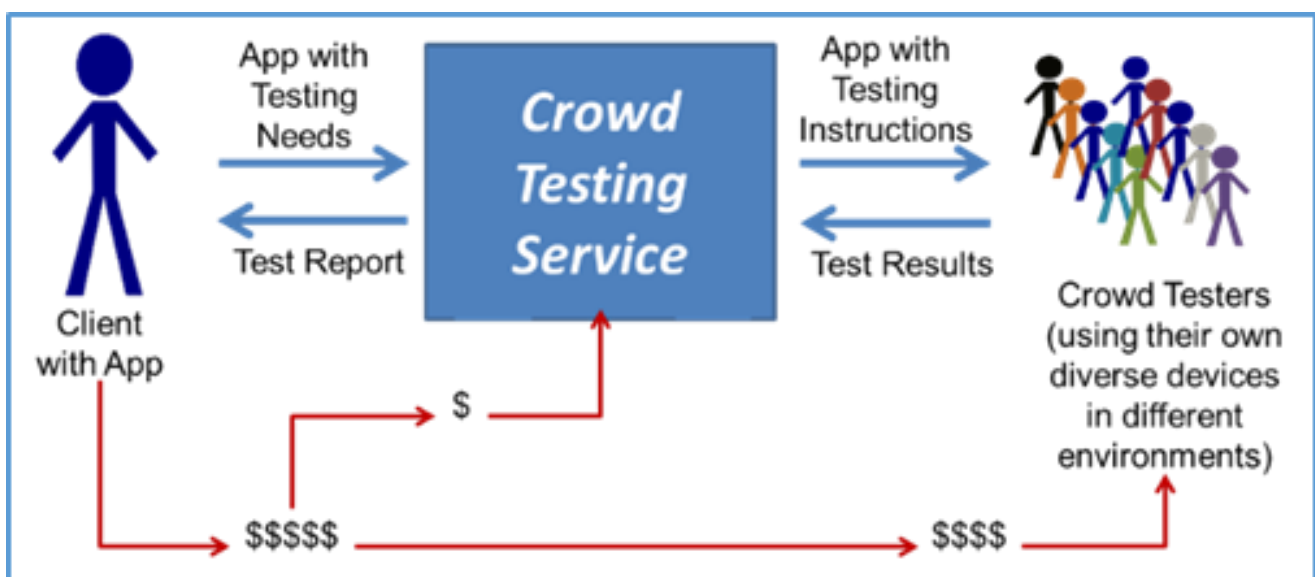
Coming a close second to 'protecting the corporate image' in executives' testing objectives is 'ensuring end user satisfaction'.  It is clear that testing needs to include more validation that apps keep the users happy rather than verifying that specifications are met. A complementary approach to the test lab is to get real users to test apps in the real world. Crowd testing allows you to select a (typically large) set of testers who are truly representative of an app's target audience, who use their own devices to perform the testing. Equally important, these crowd testers perform their testing in the app's target environment – the real world - with all its associated imperfections, such as poor connection speeds. If the real world for a localization test is a foreign country, with a different language and a different culture, then crowd testing can also be used to test that the application has been suitably localized for its new environment. Crowd testing should be considered a valuable part of any test strategy where we want to gain confidence in meeting end users' expectations.

## Big Data & Analytics

Although not on the same scale as mobile, big data is still big business. In 2015 it was forecast to generate about $35 Billion globally, increasing to $60 Billion by 2020. Testing big data (and the associated analytics) has two distinct perspectives.  First there is testing using big data and analytics. Although in its infancy, analytics can be used to focus testing on specific areas by providing information on how a system is used, so providing a solid basis for a risk-based testing approach.  Analytics can also be used to identify how similar, other systems have failed in use – so supporting a defect-based approach to testing.

Second, there is the question of how we test systems that employ big data and analytics technology. One of the most interesting problems is that data analytics is rarely simply deterministic – often the algorithms applied by data scientists to extract knowledge from big data are both complex and subjective.  Many apply a probabilistic approach, which makes the determination of whether test results are right or wrong a judgement based on probabilities, which really needs to be made by testing experts with the same level of expertise as data scientists (or by data scientists trained as testers). Another interesting characteristic of data analytics is how quickly the results are needed – big data often has a required velocity.  For instance, if big data is being used to control a smart city, then results are needed very quickly and so performance testing of these systems incorporating real-time big data is required.

When testing big data systems, we must manage lots of test data.  In this context test data typically needs to be large scale, and setting up test environments becomes even more complex when the applications require the data to change in real-time.  In many cases the big data will be personal, and so data protection also becomes an issue.  There is already a growing industry in the field of test data sanitization, and as big data becomes used more widely this will create further opportunities in this area.

## Testing Centre of Excellence

To keep up with the speed and size of delivery provided by the digital transformation technologies, we must improve the effectiveness and efficiency of our testing. For organizations that are large enough, an effective approach is to implement a Testing Centre of Excellence (TCoE). Organizations find they need an increasing number of specialists to test the new technologies associated with digital transformation – and the TCoE is often the most efficient way to resource these specialist skills. By implementing a TCoE, organizations create

a central resource of testing knowledge and skills that can be shared by all projects.  This means that specialists are used more efficiently, with internal specialists being able to concentrate on their specialist area and external specialists only being brought in when a specific need is identified.

Test automation is a separate area where a TCoE can play an important role in optimizing testing, with a TCoE being able to provide advice, skills and cost-effective access to testing tools that may be too expensive for individual projects to afford.  In 2015, on average, 30% of testing budgets was spent on testing tools, while manual test cases still account for over half of all testing.

## Conclusion

This article has provided a brief introduction to some of the testing challenges and opportunities that come with the digital transformation.  There are many more.  For a fuller description please find a more detailed set of articles at http://www.stureid.info/wp-content/uploads/2015/08/Global-Trends-v1.1.pdf, where a full list of references for this article is also provided.

**Stuart Reid** is Chief Technology Officer at STA Consulting & CONKRIT.  He has over 30 years' experience in the IT industry, working in development, testing and education.  Application areas range from safety-critical to financial and media.  Stuart supports the worldwide testing community in a number of roles.  He is convener of the ISO Software Testing Working Group, which has already published a number of software testing standards and is currently developing new standards in the areas of Reviews and Model-Based Testing.  He also founded the International Software Testing Qualifications Board (ISTQB) to promote software testing qualifications globally.

# Test Environment Management

## Anuchandran Nair, UST Global

Are you happy the way your Test Environments are managed?

Do you think your test environments are as important as your production environments?

I have asked this question to IT professionals from different companies in critical roles across the SDLC such as program/project managers, portfolio test managers, test managers, testers, developers, business analysts and business stake holders. The answer was a resounding YES from almost all of them. It was only few of the business stake holders who were a little skeptical.

Business may see a Test environment (a mirror copy of a Production environment) as an extravagant waste – always wondering "how much money did the Test environment cost?" & "how much money is it making in return?" Unfortunately, calculating how much money the company could potentially lose through little or no testing is a very tricky exercise.

While everyone accepts that it is important to focus on test environments, there is a lack of clarity to the question "Is it managed well in your company?" Multiple feedbacks on this were consolidated into a cause effect analysis as shown below:
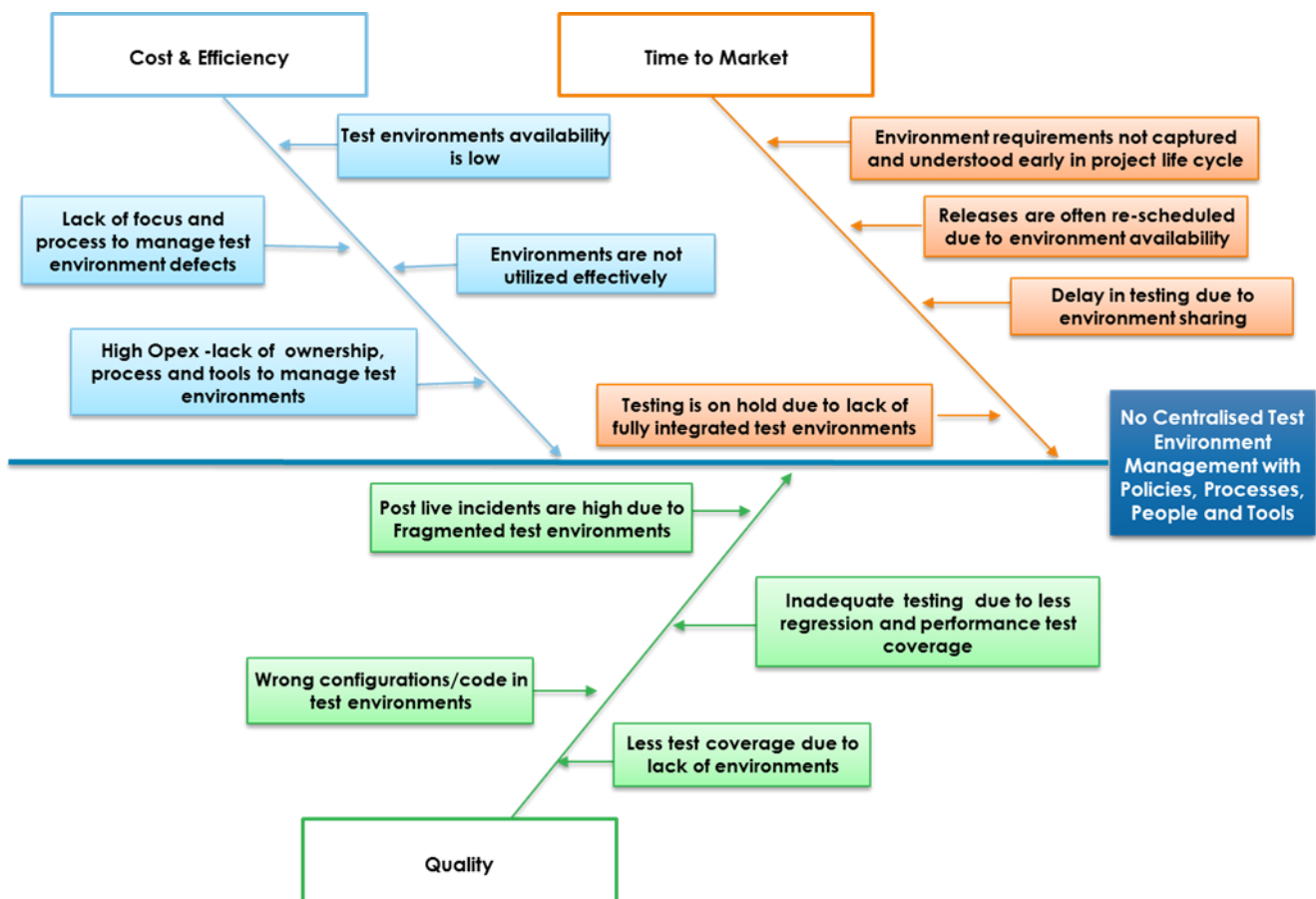


Figure 1: Fishbone Diagram – Cause and Effect analysis of Test Environment challenges

The above analysis is based on the below feedback:

**I thought I would have an integrated test environment with all systems including those required for regression -** This is often a complaint heard from Test managers during smoke testing where they realize that the end to end flow cannot be tested without a particular test environment that is missing. Due to this, testing cannot be continued until this environment is ready. This leads to testers waiting till environment is setup and leads to financial loss due to the delay.

**I assumed test environments were in place until yesterday when my test manager told me that it is being used by another project -** Project managers are forced to keep the project on-hold until test environments are available. Test environment booking and conflict management are major challenges in many organizations, resulting in indefinite delay in testing and release.

**Release will be re-scheduled due to low availability of test environments -** Project managers are forced to re-visit go live date due to delay in testing, most often due to the low availability of environments. Monitoring, pro-active maintenance and overall support to test environments are often assigned least priority. As a result, frequent incidents lead to low availability of test environments.

**We pay high maintenance cost for test environments but they are not available to projects when they need them -** There are multiple unattended test environments in a landscape created by projects in the past and subsequent projects end up creating new environments. These environments are not tracked or maintained centrally with the right level of code. Although not used, IT ends up spending a lot on storage and support costs.

**Projects give requirements today and want the environments ready yesterday -** The complexity and efforts involved in delivering and supporting test environments are often misunderstood by projects. Environment delivery managers are not engaged initially, from solution design workshop capturing detailed requirements, producing end to end test environment diagram and validate with project manager and test manager before start building environments.

**It is very expensive to provision and support test environments and managing their availability is challenging -** Computer services team faces complications in building and delivering environments due to complex architecture of modern applications with typically tens, if not hundreds, of servers and large number of configuration settings and data for all systems connected together. The real-time interdependency on other systems exacerbates this further.

**Testing is often blocked due to environment** issue - I have heard this complaint from almost everyone in testing space. This may not be always true and there could be code defects misinterpreted as environment issue. In most cases, there is no single point of contact to own these issues, carry out root cause analysis by coordinating respective technical teams and fix defect/incident. One of the major challenges noticed everywhere is a lack of support from services team to fix non-production incidents as their priority is to fix production incidents.

**Post-live incidents are high due to Fragmented test environments** - Yes, this is a fact in many companies. Test environments are not a replica of production and it is compromised due to high cost in building and supporting test environments. This will impact test coverage and integrity of testing will often lead into major post live incidents heavily impacting business.

**Business has complained on the delay in release and increased QA cost in projects -** Time to market is key to the success of business in a highly competitive digital world where **IT** is the differentiator. Based on feedback from project managers, QA cost is increasing and becoming bottleneck with planned releases. Most often, testing is delayed due to lack of environments or issues in environments.

Traditionally, Test Environments were embedded within respective delivery portfolios, programs or projects. Day-to-day delivery faced typical challenges as mentioned earlier associated with this model. Companies are now establishing a Centralized Test Environment Management Service with the objective of streamlining Test Environment delivery and driving cost efficiencies.

A typical to-be state of high level Test environment management function within the project life cycle is provided below:
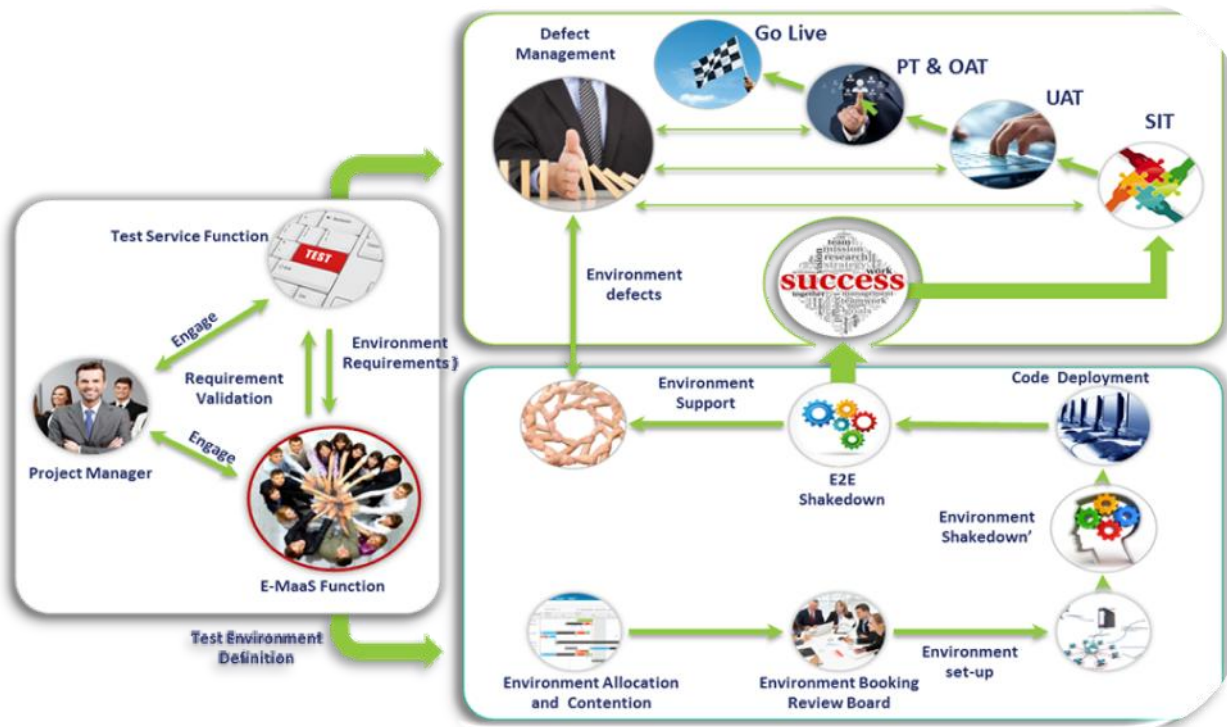


**Anuchandran Nair** [anuchandran.nair@ust-global.com | LinkedIn], Senior Advisor at UST Global, is a Subject Matter Expert in IT strategy, IT Governance and IT service management. He has envisioned and designed methodologies in IT outsourcing area. He has architected Test Environment Management service framework for UST Global. He holds Masters in Computer Science and is an ITIL V3 Expert and ISO 20000 Auditor.

# BCS SIGiST 2016 – your invitation

## Isabel Evans, SIGiST Programme Secretary

The BCS SIGiST 2016 programme is being planned at present. We have taken into account your feedback on topics you would like, and also themes of change and continuity within the industry. We have four events planned for London in 2016, and are evaluating the possibility of one in Manchester. This is your invitation to participate, learn, and contribute to an exciting programme of themed days. All the programmes will appear on the SIGiST website as they are confirmed (http://www.bcs.org/category/9264).

### London events 2016

**Summary dates for your diary:**

- Spring: Tuesday 15th March 2016: Be lean, communicate well, push your effectiveness
- Summer: Thursday 9th June 2016: IT's for all
- Autumn: Thursday 15th September 2016: Testing - it's fundamental and it's changing
- Winter: Wednesday 7th December 2016: Challenge yourself!

## Spring: Tuesday 15th March 2016

- Theme: **Be lean, communicate well, push your effectiveness**
- **Two keynotes**
- **One plenary workshop**
- **Four internationally known speakers**
    - **Lee Copeland, Lisa Crispin, Emma Armstrong and Alan Richardson**
- **Chance to participate in a research project on the effectiveness of test approaches**

Mark your diaries and book to attend the March 2016 SIGiST now! The speakers and topics are confirmed. We are honoured to have with us four internationally renowned speakers and test experts, each of whom will provide unique insight, experience and practical ideas. Lee Copeland will speak on Lean Start Ups and the lessons for testers. Lisa Crispin and Emma Armstrong will facilitate a plenary workshop on communication and overcoming communication difficulties. Alan Richardson – the Evil Tester himself – will explain how as a tester you can start to become more technical and look for security as well as functional issues.

**You asked in feedback to the SIGiST for** more participative sessions, and so Lisa and Emma's workshop is the main session for the day, enabling all participants in the day to work on communication skills. For the full agenda, abstracts and speaker bios, see elsewhere in The Tester. Additionally we are pleased to have a research team from the University of Malta who are investigating how we test, using EEG and eye tracking techniques: they are looking volunteers from us all to take part in 15 minute research sessions through the day. Your chance to participate in research to improve the industry.

Booking now open: http://www.bcs.org/category/9264
See above, page 3, onwards for agenda, abstracts and speaker information.

## Summer: Thursday 9th June 2016

- Planned theme: **IT's for all**
- **Two keynotes**
- **Two 90 minute workshops**
- **Presentations, case studies and discussions**
- We are planning to cover a number of topics requested in feedback from SIGiST including accessibility, usability, and other attributes that underpin the user experience.

IT is ubiquitous; everyone is using it or is affected by it. This means as testers we need to widen our scope and understanding. User experience, usability and accessibility are **topics you asked for in feedback to the SIGiST**, and they are all of huge importance to the industry. We are negotiating with speakers to provide workshops and talks on these topics in June, and also I hope to arrange speakers and discussions on availability of IT and information, testing ethics, IT and society.  We hope to provide hands on experiences in a demo lab. Contributors so far planned: Dave Williams on accessibility, Steve Green and Test Partners with an accessibility workshop and demos; Nick de Voil with a usability case study and workshop.  I will have more to tell you when the rest of the speakers are confirmed, but mark your diaries for 9th June 2016.

## Autumn: Thursday 15th September 2016

- Planned theme: **Testing - it's fundamental and it's changing**
- **Two keynotes**
- **Workshops**
- **Presentations and discussion**
- We are planning to cover some fundamental but often neglected subjects such as test data, as well as presentations with latest research and changes in test practice.

Some of you have asked for more on testing basics and fundamentals sessions, and some of you have asked for more advanced sessions and thoughts on the future of testing, **based on your feedback** in the September SIGiST we are planning a mix of speakers and topics including workshops, discussions and presentations. Speakers booked so far include: Professor Mark Harman, Derk Jan de Grood, Chris Cooper Bland, Neil Thompson, and Malcolm Lees. Their topics cover data, architecture, disciplined agile, performance engineering, a simple planning tool, latest research on testing. I hope also to book a testing fundamentals workshop and a discussion session. More to follow when the topics and remaining speakers are confirmed. For now, reserve 15th September in your diary.

# Winter: Wednesday 7th December 2016

- Planned theme: **Challenge yourself!**
- **Keynotes, presentations, soap box sessions, discussion, workshop, participation**
- We are planning to run sessions which cover challenges within testing, but also sessions where you will be invited to challenge yourself and to learn.

In the December event, we'll be asking you to challenge yourselves, and to learn about challenges. Our opening keynote is already confirmed as Mieke Gevers, who will speak about the challenges of Performance Testing. Stuart Reid will run a hands-on workshop to provide a test design and techniques challenge for participants. David Oxley will speak on the challenges of security testing. We also hope to run soap box sessions, so any of you can speak for 5 minutes on a topic close to your heart, and to have discussions. We also want to launch a couple of new speakers, who we will pair up with mentors during the year to prepare them for a short speaking slot.

## Do you want to speak at events?

There are still speaking slots available in London for June, September and December, so if you would like to speak, and have something to say that fits the theme for the day, please contact us. I am also starting to collect ideas and speakers for 2017...

If you have experience in these areas and would like to speak, even if you have never spoken before, or if you have a talk on another topic, please contact me via
http://www.bcs.org/category/10880.

## Do you want to sponsor events?

If your company works in these areas providing tools, software or consultancy/training you might want to sponsor an event, if so please contact Hiedi Homan via
http://www.bcs.org/upload/pdf/sigist-vendor-information-sheet.pdf

*The SIGiST committee reserves the right to amend the programmes if circumstances deem it necessary. Workshops in June, September and December will have limited places.*

# Event Listings

If you would like your event listed here, please contact the Editor phill.isles@bcs.org

## 2016

## March

**SIGiST**
15 March 2016
London, UK
http://www.bcs.org/server.php?show=nav.9264

## May

**STAREAST**
1 - 6 May 2016
Orlando, US
http://stareast.techwell.com/

**Trondheim Test Conference - TTC2016**
11 - 13 May 2016
Trondheim, Norway
http://event.dnd.no/ttc/

## June

**Belgium Testing Days**
13 – 16 June 2016
Brussels, Belgium
http://btdconf.com/

**SIGiST**
9 June 2016
London, UK
http://www.bcs.org/server.php?show=nav.9264

## September

**SIGiST**
15 September 2016
London, UK
http://www.bcs.org/server.php?show=nav.9264

**STARWEST**
TBC 2016
Anaheim, US
http://starwest.techwell.com/

## October

**EuroSTAR**
31 October – 3 November 2016
Stockholm, Sweden
http://www.eurostarconferences.com/

## December

**SIGiST**
7 December 2016
London, UK
http://www.bcs.org/server.php?show=nav.9264

**Agile Testing Days**
5 – 8 December 2016
Potsdam / Berlin, Germany
http://www.agiletestingdays.com/

## Did you get your Personal Development Plan email with suggested potential CPD activities?

The BCS Personal Development Plan (PDP) uptake is going well, with thousands of registered users already actively recording their CPD Development Goals, Activities and preferences. It's not just about recording details though, as there is a Resources section that shows live feeds of potential CPD activities, and a tailored email is sent every 2 months with details of the latest videos, articles, blogs, books and research in your specified field of interest. If you haven't registered yet, you can see the content from the latest PDP bulletin for topics relating to solution development and implementation here http://www.bcs.org/content/ConWebDoc/50854 or by going to the CPD Portal at:  http://www.bcs.org/pdp/.

The BCS Personal Development Plan is free to use; BCS members can use their Member Secure Area login and password to access it at https://pdp.bcs.org/, and non-members can use most of the facilities (using the same link) and registering to create their own user name and password. You can use it on a PC / laptop or compatible tablet PC or smartphone.

**Specialist Group in Software Testing**

# THE TESTER

## SIGiST Summer Conference
## Thursday 9th June 2016

### 57

**IN THIS ISSUE**

### From the Editor

Welcome to the *SIGiST* and *The Tester* for June 2016.

The theme for June's conference is *IT's for all!* Sponsored by Test Partners, we have a great selection of talks and workshops, from international speakers, with subjects including Information Ethics, User Experience, Assistive Technologies and Enabling Education Globally. Come along and join in the discussions!

In this edition of The Tester look out for details of our new speaker mentoring programme, details of an opportunity to work with the BCS, and details of our events planned for the rest of 2016.

Did you miss our BCS SIGiST conference in Manchester in April? "*Northern Lights*", a one-day event of conference presentations was held at the Capita IT Professional Services office in central Manchester. We received good feedback from delegates attending, so are planning to run more events outside of London.

Phill Isles
The Tester Editor
phill.isles@bcs.org

### Conference Booking Instructions

To register online, please use the link below, or scan the QR code with your smart device. Please note the BCS booking system accepts multiple and third party bookings.

https://events.bcs.org/book/1957/

Join our Linked-In Group:

http://www.linkedin.com/groups?mostPopular=&gid=3466623

Follow us @SIGiST

# Conference Agenda

| | |
|---|---|
| **BCS SIGiST – Summer 2016 Conference – Thursday 9th June 2016** **BCS 1st Floor, Davidson Building, 5 Southampton Street, London. WC2E 7HA.** | |

## *IT's for all*

| Time | Session | |
|---|---|---|
| **09:25** | ***Welcome – Stuart Reid, Chair, SIGiST*** | |
| **09:30** | Keynote / Discussion ***SW testing, IT and Information Ethics: Question the unquestioned*** *Nathalie Rooseboom de Vries van Delft, Managing Consultant Testing, Capgemini* | |
| **10:30** | *Networking Session – Jen Wheeler, Networking Secretary, SIGiST* | |
| **10:45** | Coffee , Tea & Refreshments | |
| **Morning** | **Presentations** | **Workshop** |
| **11:15** | ***Optimising the user experience of a website Case study*** Nick de Voil, De Voil Consulting | ***Accessibility Testing with Assistive Technologies*** *Steve Green and Paul Crichton TestPartners Ltd* |
| **12:00** | ***Software Localisation and Software Localisation Testing: An Overview and Case Study*** Dr Mark Rice (short talk) | |
| **12:20** | ***Enabling education globally through mobile technologies*** Julian Harty, Commercetest, (short talk) | |
| **12:45** | ***Q&A / discussion leading into lunch*** Led by Nathalie | |
| **13:00** | Lunch and networking, discussion in networking area Test Partners Ltd – test lab / accessibility tools / demos ___*Vendor presentation 13:10- 13:40* **Test Partners Ltd**___ | |
| **Afternoon** | **Presentations** | **Workshop** |
| **14:00** | ***Why Effective Accessibility is a Mind-set not a Checklist*** *Dave Williams, Independent Consultant* | ***Evaluating and testing the usability of software applications*** *Nick de Voil De Voil Consulting* |
| **14:45** | ***Quality in use: The beating heart of the user experience*** *Isabel Evans, Independent Consultant* | |
| **15:30** | Coffee, Tea & Refreshments | |
| **16:00** | *Keynote / Discussion* ***Making IT Good for Society: the Power of the Testers*** *David Evans - Director for Policy and Community (BCS)* | |
| **17:00** | ***Close - Stuart Reid, Chair, SIGiST*** | |

The SIGiST committee reserves the right to amend the programme if circumstances deem it necessary.
**Workshops will have limited places.**

# Conference Sponsor

**Test Partners**

## Test Lab & Consultancy Services

Whether you're looking for a turnkey testing service or flexible resourcing to support your own testing team, Test Partners' Consultancy division and Test Lab in central London can provide all the testing resources and facilities you require.

### Test Lab

Our Test Lab in central London is designed to respond rapidly to testing requests, efficiently handling projects lasting from a few hours to many years.
We can support any development methodology, from waterfall to agile and can ramp the team size up and down as required.
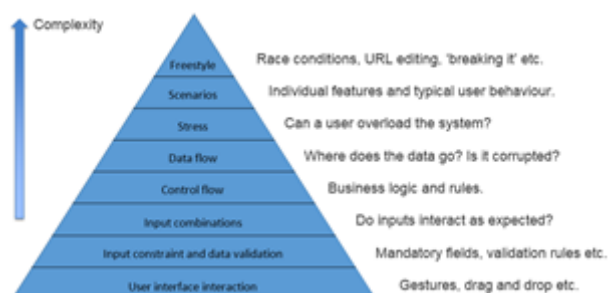
### Exploratory Testing

Since 2001 we have been the UK's leading exponents of exploratory testing and have developed a unique approach that is far more efficient and effective than scripted testing.

- Context – what are the available time, resources, risks, constraints, objectives etc.
- Inventory – what is there to test?
- Oracles – how do we know if it's right?
- Test plan – Risk-based. Lightweight and flexible
- Test approach – what tools and techniques will we use?
- Reporting – minimal but sufficient
- Management – ad-hoc, formal or session-based

From our "building blocks" to our 8-layer testing model, everything we do is driven by the context of each project, to maximise efficiency.

### Consultancy

Our Consultancy division supplies experienced test resources and proven processes to provide you with information about the quality of your software via on-site services including:

- Test Process Review / Health Check
- Strategy and Planning
- Test Management
- Test Analysis, Script Development and Execution
- Test Automation & Regression Testing

### Compatibility Testing

- Our comprehensive Compatibility Testing Lab facilities include a wide range of Windows and Mac hardware and software to enable testing on every end-user environment you could want.
- Every Microsoft and Apple operating system and service pack since 1995.
- Every version of popular browsers such as Internet Explorer, Firefox, Safari, Opera and Google Chrome.
- Every version of major plug-ins such as Flash Player, Shockwave, Adobe Reader, Windows Media Player, .Net Framework etc.
- Nearly 100 mobile devices.

## Accessibility Testing

We offer a comprehensive range of accessibility testing and consultancy services to support development projects from concept through to launch and maintenance.

- Concept review
- Wireframe review
- Creative design review
- Template (WCAG) testing
- Expert review with assistive technologies
- Final (WCAG) testing
- User testing with disabled participants
- Automated testing

## BS8878 Accessibility Governance



Our BS8878 governance programme is ideal for clients wanting to achieve and maintain the highest level of website accessibility.



## Accessibility Training

- JAWS Screen Reader Training
- WCAG Testing Training
- Accessibility Training for Project Managers

## UX Lab Hire

Situated in the centre of the City of London, our purpose built user testing study lab and observation room are available for hire.



The study lab has a top-end PC with microphones and cameras, while the observation room is a comfortable environment in which to watch the testing.

## London Open Device Lab

The Open Device Lab is a free facility for testers and developers to come and test the layout and behaviour of their mobile apps and websites on all our mobile devices.



We've got about 90 phones and tablets including all the popular Apple, Samsung and Google Nexus models. To make a booking, please email odl@testpartners.co.uk

## Find us on Procurement Portals

**G-Cloud**
www.digitalmarketplace.service.gov.uk/g-cloud/search?q="Test+Partners+Ltd"

**Ariba**
discovery.ariba.com/profile/AN01011471333

www.testpartners.co.uk
0800 612 2780
enquiries@testpartners.co.uk

**Visit our stand at the SIGiST conference
Thursday 9th June 2016**

# SIGiST Conference Venue

The June 2016 SIGiST conference will be held at the BCS London office. Travel details and location below.

## London office guide

### How to get to the BCS London office

First Floor
The Davidson Building
5 Southampton Street
London WC2E 7HA

Telephone 01793 417666

These area and inset maps have been simplified in the interests of ease of understanding. Not all roads are shown. The inset map below is more accurate.

Access by car is very difficult due to the local one-way system. There are no car parking facilities at BCS London. The nearest car park is located on Drury lane, Parker Street, Parker Mews, London, WC2B 5NT.

The rear door in Exeter Street is to be used for deliveries only and is normally locked.

The main entrance is fully accessible to wheelchair users and should be used by all staff and visitors.

On arrival, report to the Davidson Building Reception who will direct you to the first floor.

### Travel tips from major London stations

**Charing Cross** – 6 minutes walk

**Waterloo** – 12 minutes walk across Waterloo Bridge, or buses 139 or 176 to Stop Ⓒ

**London Bridge** – onward rail link to Charing Cross

**Kings Cross or St Pancras** – Piccadilly Line to Covent Garden tube, or bus 91 to Stop Ⓑ

**Euston** – West End Branch of Northern Line to Charing Cross, or bus 91 to Stop Ⓑ

**Victoria** (rail and coach stations) – Circle Line to Embankment, but the most direct journey is via bus 11 to Stop Ⓐ

**Paddington** – Circle Line to Embankment or Temple, Bakerloo Line to Charing Cross or buses 15 or 23 to Stop Ⓐ

**Liverpool St** – Circle Line to Embankment or Temple, or buses 11 or 23 westbound

**Fenchurch St** – Walk to Tower Hill, then District or Circle to Embankment

# Presentation Abstracts and Speaker Biographies

## *Opening Keynote*

### Nathalie Rooseboom de Vries van Delft
### Managing Consultant Testing, Capgemini

SW testing, IT and Information Ethics:
Question the unquestioned

This special session is a keynote mixed with a "house-of-commons-like" debate about ethics. Nathalie will discuss the "ethical conduct of IT", and its users; this session is guaranteed to be food for thought.  The keynote gives the attendee insight in the world of privacy and sensitive data: what it is, what is permitted and what not.

About 7 years ago Nathalie got an interest in (software testing) ethics and in extension interested in (non-)ethical behaviour around collection of data.  She'll consider how governments and enterprises are mining information and how they use this to steer society in a certain direction.  She'll make the attendee aware of the dangers of giving data away in whatever form.

It's time now to realise that especially our community, as 'guardians of quality' take a more active role in truly protecting a society that is defined as an 'information society' or at least are aware of the dangers and speak up!  We need to make sure that software isn't released with (mandatory) use of data that isn't needed for the use of that particular system or company.

Three key learning points:
- Awareness on (un)ethical use of (personal)data
- Debate on what is ethical conduct in relation to data and testing
- Wake people up to the new digital connectiveness and its possibility to exclude or include  groups / people of our society

*Nathalie Rooseboom de Vries van Delft is a testpassionista in optima forma.  She's actively involved in the (inter)national testing community, she speaks at (inter)national conferences, is member of the Belgium and Netherlands Software Qualification Board (BNTQB) and publishes regularly in different expert media.  Her favourite topics are (information) ethics, test architecture and the non-traditional, out-of-the –box, fun topics like 'Mappa Testi' and 'Unusual Testing; lessons learned from being a casualty simulation victim'.  She currently works at Capgemini as Managing Test Consultant.*

# *Closing Keynote*

# David Evans
# Director for Policy and Community (BCS)

## Making IT Good for Society:
## the Power of the Testers

In this closing keynote and discussion, David Evans will reflect on the day, the debates and the questions raised during networking and presentations.

He will lay down a challenge for the testing community: What can and what will the testing community do to help make IT good for society?

- The challenges for Society as IT becomes increasingly ubiquitous
- The role and responsibilities for IT projects and teams to meet those challenges
- The power the testing community has; perhaps without realising our influence.

*David Evans is Director for Policy and Community at the BCS.*

*David joined BCS, The Chartered Institute for IT in 2006.  He is Director for Policy and Community. After a physics degree at the University of Southampton, David started his career in IT, then moved into a variety of marketing, communications and policy roles.*

*He has worked in a range of organisations from technology startups to global technology firm Intel Corporation.  David's background covers science and technology, marketing and communications, public policy and politics.  In addition to being a professional member of BCS, he is also a member at the Institute of Directors.*

*BCS Making IT Good for Society*: http://www.bcs.org/category/18771.

## *Track Session*



# Nick de Voil
# De Voil Consulting

## Optimising the user experience of a website - case study

Website build projects sometimes seem to be subject to a different set of rules from other software development efforts, reflecting their history of sponsorship by Marketing rather than IT departments.

At the same time, attempts to bring website development under control using a requirements engineering approach can contribute to the creation of an unimaginative product that may satisfy a number of stakeholders, but does not delight or inspire anyone.

The solution to both these problems is a user centred approach where testing has a crucial role. With the help of examples from his own experience, Nick describes how to build testing into the project lifecycle in such a way that new insights progressively gained from users can be integrated with predefined business objectives.

Nick will also briefly discuss the new BCS Foundation Certificate in User Experience.

Three key points:
- The relevance of testing at different stages of the project lifecycle
- Your website can't be all things to all people – what things should it be for what people?
- To what extent can subjective experience be described in quantifiable terms?

*Nick de Voil is a certified management consultant specialising in creating digital transformation through the combination of business analysis and user experience. His thirty years of experience have also included roles in systems testing and test management, as well as software development and project management.*

*In a voluntary capacity Nick is the Member Experience Director of IIBA UK, the UK Chapter of the International Institute of Business Analysts. Nick was a contributor to the book 'Business Analysis & Leadership'. He was one of the participants in BCS' inaugural User Experience Competency Framework workshop, which eventually led to the creation of the BCS Foundation Certificate in User Experience, and he created the world's first training course in user experience for business analysts.*

http://www.devoil.com/about_us/nick_de_voil/

# *Track Session (short talk)*



# Dr Mark Rice

## Software Localisation and Software Localisation Testing: An Overview and Case Study

This presentation explores the high-level processes of software localisation and software localisation testing, in addition to discussing the importance of these processes and some of the challenges facing the software localisation industry today.  While software localisation occurs for many forms of software, the motif of this presentation is video games.

Three key points:

- Software localisation and software localisation testing are vital concepts, particularly for video games
- Numerous challenges face software localisation and software localisation testing, many of which were not present in the Golden Age of video games, such as social media criticism
- In particular, there is a lack of software localisation testing certification.

*Mark Rice has previously worked as a functional & localisation software tester and project manager in the area of video games.  He has a PhD in psychology and is qualified in Advanced ISTQB (Test Manager/Agile), Scrum, ITIL, PRINCE2, TMMi and Six Sigma.  Mark is also an affiliate of the ISTQB.*

## *Track Session (short talk)*

# Julian Harty
# Commercetest

## Enabling education globally through mobile technologies

There are vast disparities between formal school education globally.  In the 2/3rds world, with perhaps 4/5ths of the population, much of the schooling is meagre, with marginal resources, and even teachers are scarce with some schools having 1 teacher for 800 pupils, and 1 to 50 is commonplace.  Good teachers are inspirational and can help transform the lives of even the most disadvantaged.  However if pupils have to get by with mediocre teaching, missing syllabus texts, and huge classes, in poorly equipped schools, their chances of success are minimalised.  In these circumstances, mobile technologies, based on low-power, low-cost devices can help improve the teaching, learning and education.

Julian has initiated various pilot projects using mobile technologies internationally and been involved in many more projects as a result.  In this short session he'll share experiences, some of the challenges (and their solutions), and demonstrate how we can help practically, even if we're only able to dedicate small amounts of time and resources.  Also, helping address the problems is fulfilling and far better than griping about problems at work! ☺

Three key points:

- Appropriate mobile technologies can and do help improve learning, teaching and education.
- Appropriate includes obtaining and providing relevant content, in mother tongues, that fits with the context and situation of the environment and the learners
- Analytics can help all parties to improve the work and the results.

*Julian's mission is to help people live better lives through technology and particularly mobile technologies.  His mission and his work has led him to work globally for high-tech software companies such as Google, eBay, Salesforce, etc. and he's tried to help many other people find more fulfilling work.  He's also written various books, spoken at many conferences, and received occasional awards for who he is and what he does.*

*Morning Workshop*

# Steve Green and Paul Crichton
# Test Partners Ltd

## Accessibility Testing with Assistive Technologies

Test Partners invite you to take part in a hands-on workshop with a variety of assistive technologies.

If you are developing or maintaining a website and have an interest in accessibility, this practical session will be of interest to you.

We'll show you the basics for using three different assistive technologies – a screen reader, screen magnifier and voice recognition software. Once you know a few key techniques for each one, you will take them for a test drive on a website of your choice. It promises to be a fun event, which will give you an insight into the rewards and challenges that users face every day. You may even pick up a few tips that you can apply to your own digital projects.

Three Key Points:

- Learn how people use screen readers, screen magnifiers and voice recognition software
- Learn how to use assistive technologies and test with them
- Learn which assistive technologies to use and which not to use

*Steve Green is the Managing Director of Test Partners Ltd and Paul Crichton is the Head of Accessibility and Digital Inclusion.  They have specialised in website accessibility testing and consultancy for 15 years and have conducted hundreds of projects for organisations including the BBC, Microsoft and the Financial Conduct Authority.*

*Both are proficient in the use of assistive technologies and have a great deal of experience in conducting user testing sessions with people with a variety of disabilities.  They have developed an "Accessibility throughout the development lifecycle" framework, an efficient and effective means to ensure a high level of accessibility in both waterfall and agile development projects.*

http://www.testpartners.co.uk/

# Q&A / discussion leading into lunch
# Led by Nathalie



We want you to go into the lunchtime networking session ready to discuss, debate and argue!

Nathalie will pose some questions raised by the morning speakers and start the debate!

## *Lunchtime Bonus Sessions*

# Our sponsors, Test Partners Ltd, will provide delegates with experiences and a presentation about accessibility.

Test Partners Ltd will provide a practical experience in the exhibition / lunch area.  This will be designed for people to participate for as little as a few minutes if they wish.  It is intended to give them an idea of the user experience rather than how to do testing.  Examples include:

- A visual representation of the screen reader user's experience.
- A screen magnifier.
- Gloves that simulate dexterity impairments.
- Glasses that simulate a variety of visual impairments.

## Vendor presentation 13:10- 13:40 Test Partners Ltd

Test Partners Ltd will present on the BS8878 accessibility governance framework for large organisations and their "Accessibility throughout the development lifecycle" framework that is suitable for projects and organisations of any size.

http://www.testpartners.co.uk/

*Track Session*

# Dave Williams
# Independent Accessibility Consultant

## Why Effective Accessibility is a Mind-set not a Checklist

Accessible products and services enable the widest possible population to work, learn and play.  This session seeks to describe how we can get their without bankruptcy or a breakdown.

You will:

- Appreciate the legal, economic and ethical benefits of accessibility.

- Grasp the spirit of accessibility beyond perceivable, operable and understandable.

- Realise how with modest effort you can make a massive difference to the accessibility

  of your product or service without feeling intimidated by guidelines.

While accessibility testing tools, processes and techniques are valuable assets for revealing specific problems, often ten minutes observing a disabled person trying to complete a task can provide deep insights into the accessibility of your website or app.

This session humanises accessibility by drawing on personal examples when small tweaks made a significant impact on the accessibility of my workplace.

*Dave Williams is a compelling communicator with extensive experience in assistive technology and community media.*

*For 15 years, Dave's professional focus has been in: product management, marketing communications and audio production for a variety of clients including: blindness NGOs, assistive technology manufacturers, broadcasters, universities, colleges and schools.*

*Dave is a blind parent, braillist and strong advocate for accessibility.*

www.DaveWilliams.co.uk

## Track Session

# Isabel Evans
# Independent Consultant

## Quality in use: The beating heart of the user experience

In today's business environment, the user experience, commercial imperatives and the needs of society have become overwhelmingly important. It is vital that testers understand quality in use and the user experience, in order that we focus projects correctly. "Quality in use" measures the human, business and societal impacts of products. It is underpinned by technical and engineering attributes, and these build together into the beating heart of "User Experience". How well are people supported to effectively and efficiently carry out their tasks? Is the product accessible to all the people who want to use it? Does the experience of using the product generate human reactions of trust, excitement and encourage users to continue using and recommending the product? Do we reach the customers' hearts as well as their purses?

Isabel uses examples from real projects to discuss how testers design tests derived from the user personas, contexts of use, and acceptance criteria. This requires testing during early testing of concepts and designs and later testing on built products. Referring to standard ISO25000/ISO25022 Isabel defines attributes that build from the Internal Engineering qualities (functional attributes, performance measures, security) to the Quality in Use (usability, context coverage, freedom from risk) and User Experience attributes (trust, excitement, flow) which directly affect the human heartbeat.

Three key points:

- Importance of focusing on stakeholders
- Quality in use as a measure of what customers require
- Balancing the big picture and the detail

*Independent quality and testing consultant **Isabel Evans** has more than thirty years of IT experience in quality management and testing in the financial, communications, and software sectors. Her quality management work focuses on encouraging IT teams and customers to work together via flexible processes designed and tailored by the teams that use them. Isabel authored Achieving Software Quality Through Teamwork and chapters in Agile Testing: How to Succeed in an eXtreme Testing Environment; The Testing Practitioner; and Foundations of Software Testing. A popular speaker at software conferences worldwide, Isabel is a Chartered IT Professional and Fellow of the British Computer Society, and has been a member of software industry improvement working groups.*

## *Afternoon Workshop*

# Nick de Voil
# De Voil Consulting

## Evaluating and testing the usability of software applications

In this workshop, you will learn – or consolidate your understanding of – some of the key principles underlying usability evaluation and testing in the context of a user-centred design (UCD) process.  There will be brief presentations of theory followed by interactive discussions and group work addressing the practical application of the ideas.  Participants will have a chance to raise their own issues.

We will discuss topics including, but not limited to: the definition and measurement of usability metrics; the benefits of a UCD process; the roles of different project participants; difficulties with participation and ways of addressing these; expert review and heuristics versus "user testing"; the implications of continuous and phased release strategies; reporting usability test results.

Three key points:

- Discuss to what extent your organisation can benefit from a UCD process
- Understand the difference between formative and summative evaluation
- Learn from common mistakes made by usability testers

*Nick de Voil is a certified management consultant specialising in creating digital transformation through the combination of business analysis and user experience. His thirty years of experience have also included roles in systems testing and test management, as well as software development and project management.*

*In a voluntary capacity Nick is the Member Experience Director of IIBA UK, the UK Chapter of the International Institute of Business Analysts. Nick was a contributor to the book 'Business Analysis & Leadership'. He was one of the participants in BCS' inaugural User Experience Competency Framework workshop, which eventually led to the creation of the BCS Foundation Certificate in User Experience, and he created the world's first training course in user experience for business analysts.*

http://www.devoil.com/about_us/nick_de_voil/

# BCS SIGiST Mentoring:
## New and Improving Speakers 2016

Never been a speaker at a conference but you have a story to tell?

Spoken at events once or twice and now want to improve your presentations?

Loads of testing experience but never presented to your peers?

Think you have a more interesting story to tell than the ones we have told you?

The BCS SIGiST can help you become a speaker.

At the December 2016 conference in London we are offering up to 4 new or improving speakers the chance to speak. The theme for the day is *Challenge Yourself* and we want you to tell us about a testing challenge you have faced, how you overcame, or – even more interesting – how you failed and the lessons you learned.

If you are a successful applicant for this scheme, you will:

- be mentored by one of four world class testing experts and speakers who will:

    o advise how to make a really appealing abstract to submit
    o guide you in preparing your submission,
    o explain the presenting technology
    o review and help you rehearse your presentation
    o introduce you when you speak at the BCS SIGiST conference in London

- present a 10 to 15 minute talk at the BCS SIGiST on Wednesday 7th December 2016

We are privileged to have as your mentors this year:

| Dorothy Graham | Graham Thomas | Mieke Gevers | Julian Harty |
|---|---|---|---|
| dorothygraham.co.uk | www.badgerscroft.com | http://bit.ly/23gbi2O | http://bit.ly/1WbFQRo |

# BCS SIGiST Mentoring

How do I apply? Download the [application form](#) and send it to the BCS Programme Secretary, Isabel Evans (email address on the form) in an email titled "SIGiST New Speakers"

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What we are looking for at this stage is **your idea** for a presentation.

Write that in the abstract. Then fill in the key points you wish to highlight.  These don't need to be perfect yet.

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When do I need to do this? NOW! The deadline is **31st July 2016**.

What is the process the SIGiST will use to select the successful applicants? The Programme Secretary and Mentors will review the applications, select four and assign each one to a Mentor.

What happens then?  You will provide an improved abstract submission **by the end of August**, and a presentation **in December**. Your mentor will provide advice, review comments and discuss your ideas with you during this time, but you are responsible for your content and delivery.

I'm not based in London; can you help me with travel?  Ask your company to pay your expenses as part of your professional development. If that is not possible, discuss with the Programme Secretary as we pay expenses in some circumstances.

When and where is the conference? Weds 7th December 2016, BCS Offices, Davidson Building 5 Southampton Street London WC2E 7HA.

## *Challenge yourself!*

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# SIGiST White Paper Scheme

We have set up an area on the BCS website of a searchable repository for white papers and articles on testing and we are looking for contributors. That means you!

Do you have an existing paper you would like to repurpose and make more widely available through the SIGiST website?

- Then please send us the paper with three keywords for searching.

Would you like to write a new paper?

- Please send us the title and abstract together with the three keywords (or phrases)
- We will review the proposal and guide you through the authoring process
- For those who are thinking of speaking at SIGiST then this might be a good way to prepare a talk and get some useful feedback

If you have been thinking of writing or publicising an existing paper then this is the ideal opportunity. Please email your existing paper (with keywords) or your proposal to The Tester Editor, phill.isles@bcs.org

Past articles from The Tester will slowly be added to the repository as well.

Follow this link to the repository: http://www.bcs.org/category/18128

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# Write an article

We are always on the lookout for new content, so if you have a testing story you would like to share, a test technique you would like to evangelise or testing research you would like to publish, then The Tester is the place to do it. Simply email the Editor on phill.isles@bcs.org

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Belgium Testing Days or 'The BTD', the outstanding, 'hands-on', European-based, international Software Testing conference, for and by international professionals, covering all aspects of software quality, is back again!

Mark your calendar for **13th - 16th June 2016** to attend at the
Brussels Marriott Hotel Grand Place.

The central theme for BTD 2016 is "The Quality Shift" combined with a "Doing Conference":  hands-on workshops, open spaces, round table discussions, tracks, keynotes and lots of opportunities for networking with your peers and the speakers.  Take a glimpse at the conference program http://btdconf.org/program-2016/  to get an overview of the famous, world-class experts lined up to speak, and the range of hot topics that will be covered.

This year The BTD welcomes 25+ great internationally acknowledged gurus, captains of industry and leading experts, covering a range of exciting topics. Speakers include Johanna Rothman, Troy Hunt, Tauhida Parveen, Doug Hoffman, Dorothy Graham, Stuart Reid, Isabel Evans, Gil Zilberfeld, to name just a few.

Get more quality and value for a low price.  Competitive pricing means The BTD can work out cheaper than a formal training course, but you get so much more!
Don't miss attending BTD 2016!

http://btdconf.org/

# Pragmatic Approach to Data Warehouse Testing

## Shankar Mani and Bijoymon Soman,
## UST Global

## Introduction

In today's dynamic and fast evolving business landscape, organizations have to maintain an ever imperative acumen to play out strategies to be the leader in the competitive market. Fostering a customer centric approach should be a vital factor while defining and delivering business services that guarantees better value and strengthens the brand connect. Organizations will have to look back into their past business data to assess the customer response to their previous strategies. And for this, they need to consolidate the disparate Business Process Management (BPM) serviced source information into holistic story telling data view and analyse meaningful insights for making intelligent and focused decisions intended for creating strategic business transformations. This warrants the CIO Office for investments into the implementation of a Data Warehouse system to leverage better business intelligence. As a newfound sixth sense, this enables for making proactive business impacts targeted at improving customer loyalty, market planning, risk management, fraud detection, cost reduction, logistics management, etc. Such a strong foundation laid will enable consumer base expansion in both existing and newer markets. Business growth achieved by strategic merger/acquisition between organizations can also look towards achieving benefits from a Data Warehouse system. Vast amount of system and data consolidation will eventually align data towards serving common business objectives and needs of the merged organization.

Organizations usually source specialized IT skills to do meticulous planning, analysis and understanding of the application landscape and plan to siphon the echelons of information they house in disparate locations into the consolidated Data Warehouse. Further consideration must also be given regarding the implementation strategy and technology, resources to be used to perform the data Integration process alongside pioneering a data practice team with robust data governance processes. Testing plays a key role here as the success of the organization's decisions relies on these critical source data streams and consolidation has to build a high quality Single Source of Truth. In this whitepaper we will focus on how the traditional Data Warehouse testing can be customized so that testing team can play a key role in Data Warehouse program implementation through the pragmatic shift left strategy across the Software Development Life-Cycle (SDLC).

## Key Challenges to Data Warehouse Testing

- Ambiguous requirements specifications which are not granulized to a point where they can be visualized by the data architecture, solution design, development and testing teams.
- Relative time taken on discussing and finalizing requirements is more during Data Profiling and Data Modelling phase, due to multiple stakeholders involved from business.

- Data modelling and architecture issues which pop up only in the test execution phase.
- Estimating the effort and timelines for a thorough testing is difficult due to the following reasons:
  - Heterogeneous sources presenting varying levels of Data Quality and Volume
  - Limited documentation on business rules of the source systems and corresponding data flavours
- Targeting to achieve 100% comprehensive data validation is not feasible manually in many cases while staying within the CQT (Cost, Quality & Time factor) of the project.
- Performance bottlenecks in solution design that can be identified figuratively only during test execution phase.

## Data Warehouse Implementation Approach for Optimized Results

Core principles of Testing that advocates for quality gains, stay intact when it comes to testing a Data Warehouse/Business Intelligence (DWH/BI) application/environment too. However the strategy adopted and methods employed to do verification and validation will get customized for Data Warehouse testing. All specific testing objectives will be attuned to validate that the required data from the respective sources are consolidated into the desired aggregation level with adequate quality standards and also be aligned to the existing business & IT operational timings of the organization. These are further validated and reinforced by the level of desirable outcomes that are visible to consume by the Reporting Layer.
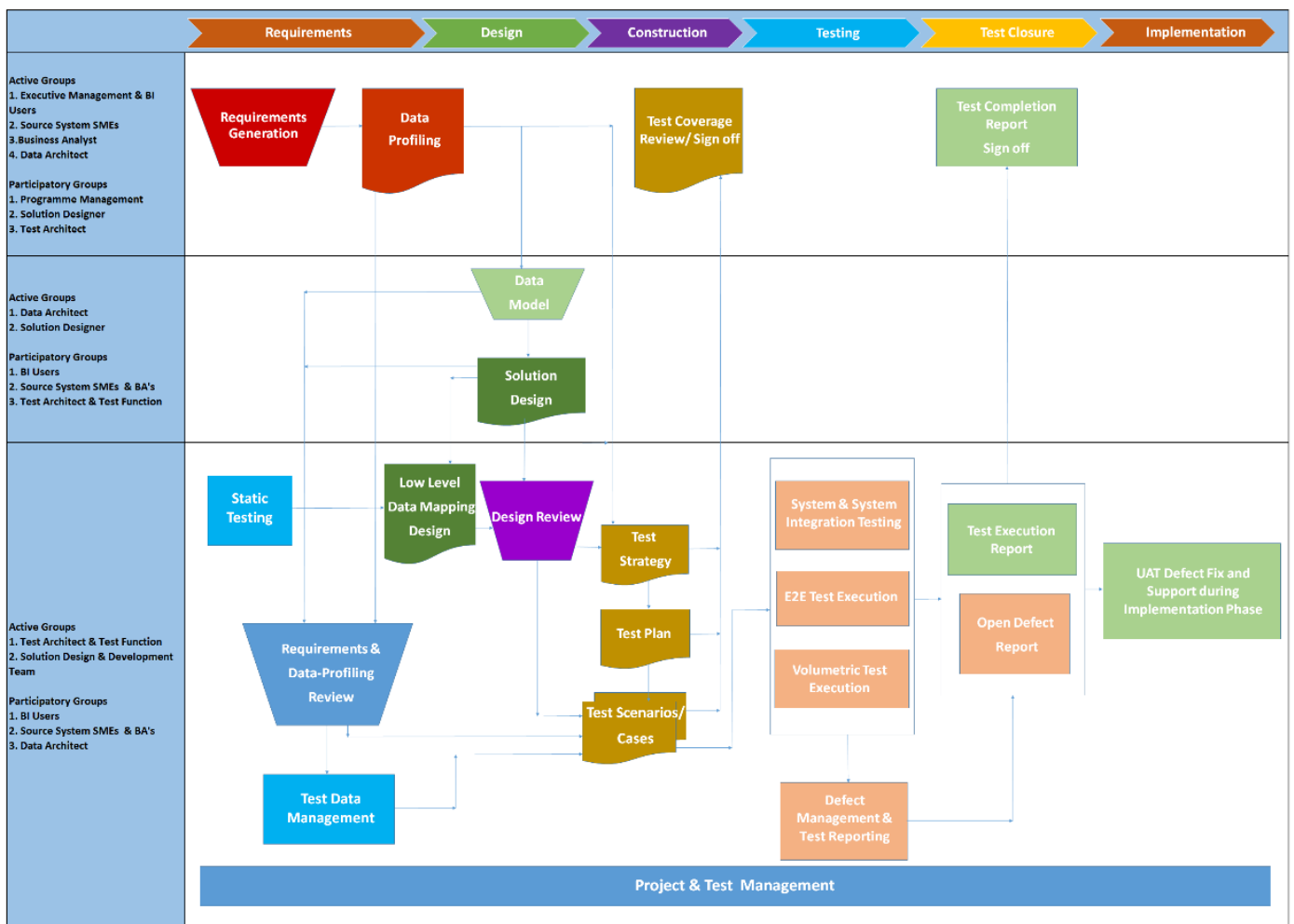


Figure 1: Depiction of Stakeholder involvement in alignment with each phase of the Program Implementation

## Requirements Engineering & Data Profiling Phase

Laying out an implementation roadmap on the subject areas for a data warehouse system is one of the critical success factors for the program. Business Team & IT Subject Matter Experts (SMEs) in consultation with the implementation team should prioritize the migration of data sources on the factors presiding on majority of organizational data, business criticality and in line with the operational flow of the business. Data that represents the business stream yielding major share of revenue for the organization should obviously be prioritized above other categories of data that rank next in business priority. Rationale behind this is that large scale data integration project will have to go through the initial project pains until everything gets into a stable rhythm for operations. A scalable delivery model with processes and standards is needed to efficiently leverage the resources for catering to the most critical data volumes. Based on the prioritization done, Design activities will commence for each of the subject areas with BI Users, Business Application SMEs, Business Analysts, Data Architects, and Solution Designers & Test Architects participating in workshops and deriving the detailed business use cases. A comprehensive study (commonly known as AS-IS Data Profiling) should happen for all  business process flows within each of the source systems that are identified for the subject areas, which will define the business rules, data flavours and data quality check filters that will then flow into the newly developed Data Warehouse systems as factual information. Data architect uses this information to model a robust and scalable Star/Snow-Flake Schema (of Dimensions and Facts) to handle the data from multitude of Sources, finally representing the consolidated business facts on each of the subject areas.

The expected outcomes at this stage are the following:

- Approved Low-Level Requirements – High-level requirement statements (BI Reporting) need to be granulized to provide specific low-level requirements against data model and the traceability to be established to the Requirements Traceability Matrix (RTM). This will specify details to source systems for history and daily loads across multi-channel systems, volume of history and daily data, the suitable application of the respective source fields, corresponding business transformations and data aggregation considerations, exception handling and data recycling considerations.
- Approved Data Profiling Sheet – Low-level requirements to identify all operational and historical data source fields that need to be mapped against target dimensions and facts. This should also cover the flavours of business scenarios and data that will be generated in daily and historical loads with the volumes expected, tracing it to approved NFR's.
- Approved Physical Data Model – Cater to all types of data sources identified considering difference in characteristics of the data coming from multiple sources and also hierarchies of dimensions.
- Business Analyst and BI team can use this information to create a visual representation of the requirements by depicting how the data will be consumed by business users in the reporting world. This should be signed off by the BI Users across various portfolios and by Data Architecture and Integration Solution Practice and leveraged to create end to end test validation suite.

## Effective Solution Design and Development Considerations for Data Warehouse

With the productive information that came out of the as-is assessment, the solution design team would need to analyse and plan on sourcing the relevant data from history archives and daily transactional sources. Solution should ensure adequate processes in place for data cleansing, enrichment, standardization and deduplication, caveat that the functional

requirements are also satisfied to provide the desired level of granularity in the Facts roll-up and drill-down analysis. History data load and daily data load are to be calibrated to suit the end objective to maintain full referential integrity and seamless data. Solution Design team must map the low-level requirement statements to the Extract-Transform-Load (ETL) framework designed for the Data Warehouse. Development team should provide a detailed low-level design to state the details of the ETL Logic for source extraction stage, transformation stage and target loading stage. This should also state all ETL Job stages to perform the migration, the source systems and the target system environments and respective connection details, ETL framework layer logic to handle data error handling, data recycling and performance enhancement. Testing team will leverage this to create test scenarios relevant to technical dynamics of the ETL based on the clarity available in the Low-Level Design (LLD). Also, the LLD should be able to show traceability to the RTM wherever applicable (although not required or is least applicable).

The expected outcomes at this stage are the following:

- High-Level Design (HLD)
    - Extraction logic from all identified Sources with details to data hierarchy representation, normalization/de-normalization mapping to low-level requirements.
    - Data life cycle in source systems should be applied in data warehouse system (Slowly Changing Dimension (SCD) Types, Delete etc.).
    - Dimensions/Facts batch load order in alignment with data model.
    - Integration of the solution to ETL framework.
- Requirement traceability matrix to be updated by the solution design and development team which should be signed off by BA, Business SME and Program Manager.
- Low-Level Design – ETL Logic for source extraction, transformation, mapping and target loading stage. This should also state all ETL job stages to perform the data migration along with source and target systems environments and connection details. This should also provide ETL layer logic to handle data errors, data recycling and performance enhancement.
- Deployment process (Code & Target Table structures) to be defined with key owners and to be done through a configuration management process.

## Aligning Test Function Activities for a Pragmatic Project Delivery

The testing practice should get involved right from the requirement analysis phase to vet and baseline requirements along with business and project delivery team. As data warehouse is meant to be the single consolidated view of truth of data from all sources, the target data model should be able to accommodate the varying characteristics of the source data coming in as part of historical data and daily data loads. Verification should commence from an approved data profiling sheet to validate the data flavours and the RTM should then connect these further into high-level BI reporting and low-level data warehouse requirements.

As part of the project workshops project stakeholders and test function should be part of the data model walkthrough and sign off with where details to 'one to one', 'one to many' and 'many to many' relationships between multiple tables can be understood in relationship to dimensions/facts. Data model tests will seek to validate the data relationships among the business entities (Dimensions and Facts) beyond the basic table level constraints. Testing team should also ensure a walkthrough of high level design and low level design from the solution design team and development team respectively. They must ensure to see the

traceability of the HLD Logic to the data warehouse requirements being clearly identified. The extraction aggregates, filters and the field level logic should justify the low level requirements. This will help the testing team to prepare test scenarios relevant to business cases that test for data flavours and data hierarchies from the HLD Logic that maps to the low level Data Warehouse requirements.

At this point, the Testing Team should ensure that the Project RTM should be updated to capture the connectivity of the Requirements to next level deliverables like Low-Level Data Warehouse Requirements, Physical Data Model, High Level Design Sections, Low-Level Design Sections, Test Scenarios, Test Cases and Defects. Only by strengthening the connectivity of all levels, we will be able to make an End-To-End Traceability to validate if all details required to form the Single Consolidated View of Truth are properly identified and captured. RTM is to be provided as a key delivery by the Solution Design and Development Team which should be signed off by Business Analyst (BA), Business Team and Program Manager.

In addition to the conventional straightforward technical ETL testing scenarios which are purely based on solution Design and the Source to Target mapping sheet, testing should step up the game by considering test scenarios and test cases prepared to test the business perspectives of the transactional data being demanded into Data Warehouse and how they roll-up and drill-down capabilities are possible in the data. These are critical business test Scenarios which could test for the following business relations:

a. Data Hierarchies followed for source entities
b. Data flavours of various types of transactional business flows and any specific characteristics associated
c. Interrelation between multiple interconnected fields
d. Adaptability of each of these conditions when considered for various geographies or demographics

The data quality issues in existing legacy and operational systems should also be considered. Any manual data fix processing carried out in source systems would mean that we need to properly take care of extracting only the data that has been corrected through these means. We need to migrate only the cleansed data and at the same time for daily loads, we should think if the same cleansing process needs to be built into the to-be system as well, if the previous system is going to be decommissioned. At the end of the Day, BI Users should be using the cleansed, enriched, de-duplicated and standardized data suitable for use with reporting standards.

## Test Planning and Estimation, Test Design, Test Environment & Data

- Testing effort for Dimension and Fact Components involved in a data model should be based on classifying them based on complexity levels. The amount of complexity can be graded based on the number of sources, number of Fields, amount of Transformations, recycling factors, data volume and above all the amount of business use cases involved in order to satisfy full test coverage.
- Business SME, Business Analyst & Data Architect should approve the End to End test scenarios to cover the business functionalities and data model.
- Solution Design should approve the test scenarios and test cases to cover the ETL Logic for source extraction stage, transformation stage and target loading stage, data error handling, data recycling & performance enhancement.

- Data mining will be performed on the basis of approved data profiling sheet and will be leveraged as test data for system test cases. Plan for data sourcing should take into account of testing the historical and daily data Load. Further to that, the test conditions that cover the updates and deletes on data should also be planned and monitored between the loads.
- Dev Ops Model of build integration can be implemented so that the test function will be able to plan the test execution effort for the defect fixes and new features being available with each build. This will reduce the turnaround time for testing team and also reduce the amount of time to be spent of regression.

## Accelerators for Testing Phase

Automation Tool is a key lever to deliver any Data Warehouse testing project with an optimized cost with high data fidelity validation on the committed delivery timelines. After analysing the requirements, design and testing scope look out for a tool in the market which can suffix in meeting the below validation areas else plan to develop an In-house tool solution which will cater to these validation points:

- Data completeness & data quality (across various sources and target database)
- Static validation of data structures in multiple environments
- Business transformation rule validation
- Volumetric test data outcome validation
- Duplicate data check
- Durable key check
- SCD Validations (Types 1 to 4) & Deletes
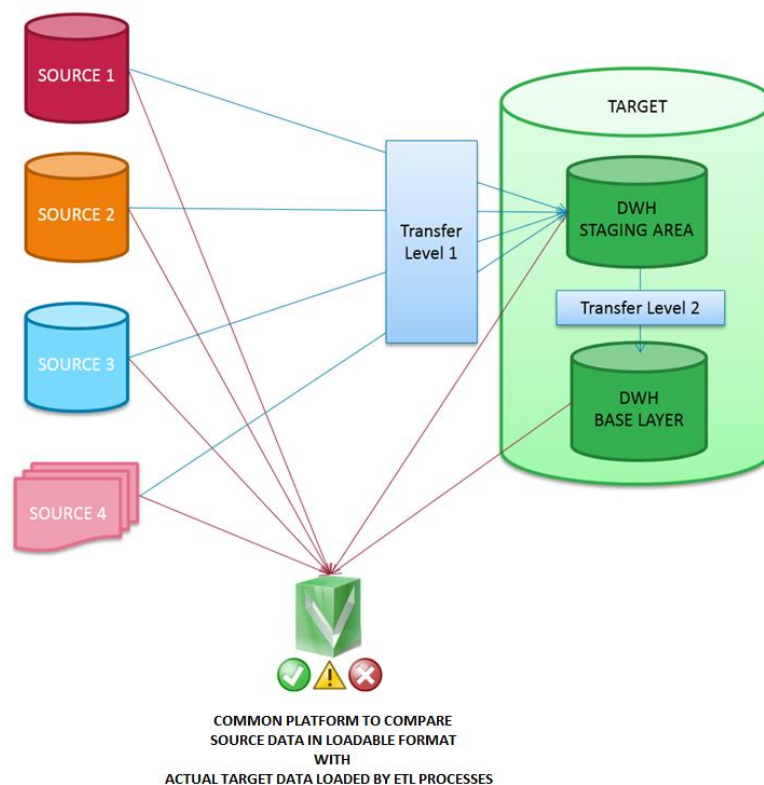- Reporting capability (for the above features)



Figure 2: Depiction of Functional Flow for seamless Data Comparison between Source and Target

The Physical Implementation of the comparison platform should ensure scalability in terms of the number and type of Source Data Stores, the Data Volume in each of them and overall, the layers (Staging or Base) at which comparison is warranted.

Automation tool if implemented can be leverage even by the development team during their unit / integration testing phase and flush out defects early in the project lifecycle.
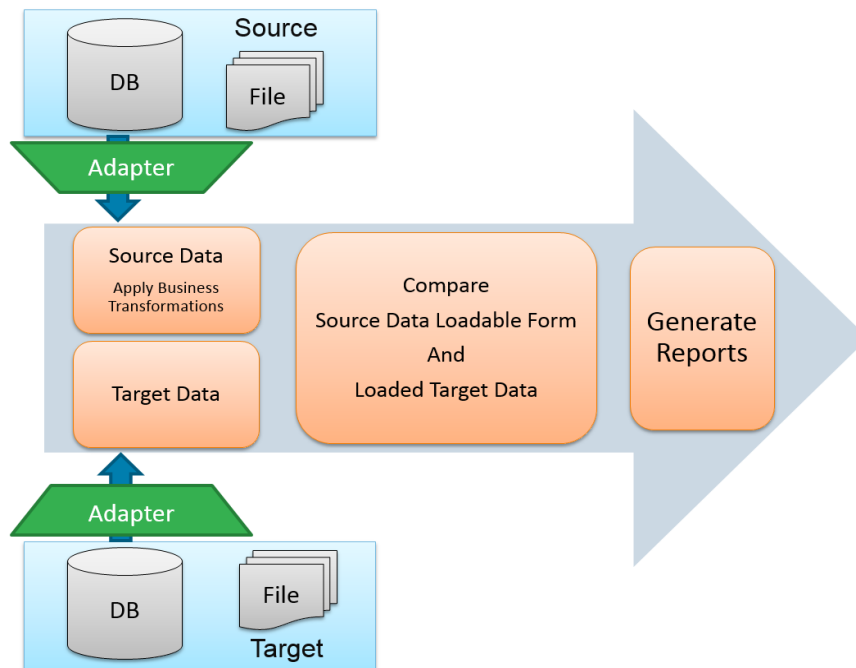


Figure 3: Depiction of Physical Layout Plan showcasing scalability across different types of Data Sources and Data Volume

Once the testing phase is completed, the automated scripts could still be used and maintained for following purposes:

- By the Development Team during deployment to Production environment and Job and Data Monitoring phase
- By the Maintenance Team to quickly sanity check the Jobs post patch deployments
- By the SDLC Team to perform Test Driven Development while implementing Enhancements to functionalities

## Effective Program governance practices to be ensured by the Customer

Even if the customer has handed over the initiative to the vendor/ internal IT team who are specialized in the data integration space, it still forms the responsibility of the business team to have the complete ownership and governance of the data of their organization. They should be able to comprehend the data needs as defined in the requirements for reporting and have an authoritative say on the business process that generate and handle data in Online Transactional Processing Systems (OLTP). Overall they need to strategically align the partner teams to meet the business delivery priorities for the program.

The program manager should ensure the involvement of business system SMEs and BI Users in project workshops to detail and granulize the requirements for use by other stakeholders.

SMEs should explain the business process and data representations in OLTP systems and BI Users should quantify the data needs and see the granularity levels available in both the history and daily data sources. The program manager should take accountability of maintaining the RTM  by getting it updated by various functions with the traceability rooted into granular level requirements derived during the project workshops as this will instil the team with confidence to proceed into each stage . It will also ensure water-proofing of all the BI level user stories with the right data scoping brought about by the consideration of the right set of data sources as well as data flavours. Customer should also track the project's KPIs to progressively evaluate the adherence of the project deliveries to the expected success criteria and accordingly fine tune the same during the course to steer it towards achieving the organizational business goals on time with quality.

## Key Factors to Successful Implementation of Data Warehouse System

In a nutshell, to successfully implement a data warehouse system, the following criteria should be considered:

- Project requirement workshops should strive to relate the holistic view of the reporting needs of executive management (and other end users of the reports) to the enterprise architecture requirements put in place by the engineering team

- Pragmatic plan should be in place to support the staged implementation, even encompassing the phase for solution prototyping for all end to end scenarios

- Project plan should consider prioritizing the design and implementation of the key business areas and data volumes where the BI Reporting is crucial for the client executive board

- Implement effective communication methods with all stakeholders and implementation partners through meetings and workshops from inception to project pilot phase

- Business team, System SME's, Business Analyst and BI team to be part of each stage gate criteria of the SDLC for walkthrough and approvals

- Design and data model should give enough consideration on the time and effort for ETL jobs of history and incremental data loads as this time should factor into the business operational job timings

- Data quality is the key success criteria in Validation where processes should be defined with the objective of providing 100% reliable business data in the Data Warehouse system

- Automated Validation using a reliable platform should be a strong compliment to functional and performance cycles, so as to ensure 100% Data Coverage for quality assessment for scenarios targeted at atomic level validation to those modelled on specific transactional user stories.

- Identify the frequency and updates of data from all external and internal sources so that operational aspects are design to align with the relevance required by business reporting needs.

**Shankar Man**i is Test Manager with over 12 years' experience, currently working with the Europe Delivery Team of UST Global. He has worked in different sectors retail, financial services & logistics as test manager, test consultant and played key roles for delivering large programs for the clients.

**Bijoymon Soman** is a Data Warehouse & BI Test Expert with over 9 years' of testing experience, spanning varied technology platforms for Banking & Financial Services and Retail Clients. He has over 5 years' of experience purely in BI & DW and ETL Testing with extensive knowledge on functional business processes.



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## Write an article

We are always on the lookout for new content, so if you have a testing story you would like to share, a test technique you would like to evangelise or testing research you would like to publish, then The Tester is the place to do it. Simply email the Editor on phill.isles@bcs.org

---------------------------------------------

# Opportunities with BCS, The Chartered Institute for IT

BCS will be commencing development on the next Digital Industry Trailblazer Apprenticeships Standards over the forthcoming months and we are searching for a number of **subject matter experts** with a **breadth of industry knowledge and experience** in the following disciplines to assist us:

- Infrastructure Technician (Priority for Development)
- Digital Marketer
- Cyber Security Technologist
- Software Tester
- Software Development Technician
- Unified Communications Trouble-shooters
- Data Analysts
- Cyber Intrusion Analysts

Your role as a subject matter expert on the development panel would include the following:

- Providing industry expertise and knowledge
- Building a syllabus for each knowledge module
- Creating a bank of questions (items) for each knowledge module
- Tailoring our end-point-assessment model to the Standard, including developing a Grading Framework
- Building a bank of synoptic projects for the end-point-assessment
- Creating or reviewing courseware

Our aim is to develop a valid, fair and reliable assessment that meets the knowledge, skills and behaviours defined in the standard which are documented in the Occupational Briefs located here: https://www.thetechpartnership.com/recruit-and-train/apprenticeships/trailblazer-apprenticeships/available-now/

If you are interested in being involved in this opportunity, helping people embark on their career in IT, please contact us.

**Please email product.development@bcs.uk with an expression of interest and a brief summary of your experience (CVs are also welcome).**

# BCS SIGiST 2016 – your invitation

## Isabel Evans, SIGiST Programme Secretary

The BCS SIGiST 2016 programme is underway. We have taken into account your feedback on topics you would like, and also themes of change and continuity within the industry. We have four events planned for London in 2016, and one in Manchester. This is your invitation to participate, learn, and contribute to the rest of an exciting programme of themed days for 2016. I am also planning the 2017 programme so do consider whether you would like to speak at a future SIGiST. All the programmes will appear on the SIGiST website as they are confirmed (http://www.bcs.org/category/9264).

### London events 2016

**Summary dates for your diary:**

- Summer: Thursday 9th June 2016: **IT's for all**
- Autumn: Thursday 15th September 2016: **Testing - it's fundamental and it's changing**
- Winter: Wednesday 7th December 2016: **Challenge yourself!**

## Summer: Thursday 9th June 2016

Booking now open: http://www.bcs.org/category/9264
See above, page 6, onwards for agenda, abstracts and speaker information.

## Autumn: Thursday 15th September 2016

- Planned theme: **Testing - it's fundamental and it's changing**
- **Two keynotes**
- **Workshops**
- **Presentations and discussion**
- We are planning to cover some fundamental but often neglected subjects such as test data, as well as presentations with latest research and changes in test practice.

Some of you have asked for more on testing basics and fundamentals sessions, and some of you have asked for more advanced sessions and thoughts on the future of testing. **Based on your feedback** in the September SIGiST we are planning a mix of speakers and topics including workshops, discussions and presentations. Speakers booked so far include: Professor Mark Harman, Derk Jan de Grood, Chris Cooper Bland and Neil Thompson. Their topics cover data, architecture, disciplined agile, performance engineering, a simple planning tool, and the latest research on testing. We'll also have a testing fundamentals workshop run by Mark Winteringham & Dan Ashby of the Software Testing Clinic, and Derk-Jan will run a planning workshop. Reserve 15th September in your diary.

# Winter: Wednesday 7th December 2016

- Planned theme: **Challenge yourself!**
- **Keynotes, presentations, soap box sessions, discussion, workshop, participation**
- We are planning to run sessions which cover challenges within testing, but also sessions where you will be invited to challenge yourself and to learn.

In the December event, we'll be asking you to challenge yourselves, and to learn about new challenges. Our opening keynote is Mieke Gevers, who will speak about the challenges of Performance Testing. Stuart Reid will run a hands-on workshop to provide a test design and techniques challenge for participants. David Oxley will speak on the challenges of security testing. Antony Marcano will discuss the challenges that 2017 will bring for us as technology continues to change.

We will also run soap box sessions, so any of you can speak for 5 minutes on a topic close to your heart, and to have discussions. Additionally, we hope to launch 1 to 4 new speakers who have been mentored by four of the best international speakers!

## New speakers: a chance to be mentored and speak in December

We want to launch some new speakers, who we will pair up with mentors during the year to prepare them for a short speaking slot at the December conference. Our mentors are Julian Harty, Graham Thomas, Mieke Gevers and Dot Graham! Please see http://www.bcs.org/category/18795 and the article on the New Speaker Mentoring Scheme in this edition of the Tester. The closing date to apply is end July, so if you, or someone you know, would like the chance to start on the route to being a speaker, please apply.

## Do you want to speak at events?

We now have a nearly full programme for September and December, but there are still chances to speak, and I am starting to plan 2017. If you want to speak, please apply at http://www.bcs.org/category/10880, or let us know ideas for topics and speakers you'd like to see at the SIGiST.

## Do you want to sponsor events?

If your company works in these areas providing tools, software or consultancy/training you might want to sponsor an event, if so please contact Hiedi Homan via http://www.bcs.org/upload/pdf/sigist-vendor-information-sheet.pdf

*The SIGiST committee reserves the right to amend the programmes if circumstances deem it necessary. Workshops in June, September and December will have limited places.*

# Event Listings

If you would like your event listed here, please contact the Editor phill.isles@bcs.org

## 2016

### June

**SIGiST**
9 June 2016
London, UK
http://www.bcs.org/server.php?show=nav.9264

**Belgium Testing Days**
13 – 16 June 2016
Brussels, Belgium
http://btdconf.com/

### September

**SIGiST**
15 September 2016
London, UK
http://www.bcs.org/server.php?show=nav.9264

### October

**STARWEST**
2 – 7 October 2016
Anaheim, US
http://starwest.techwell.com/

**EuroSTAR**
31 October – 3 November 2016
Stockholm, Sweden
http://www.eurostarconferences.com/

### December

**SIGiST**
7 December 2016
London, UK
http://www.bcs.org/server.php?show=nav.9264

**Agile Testing Days**
5 – 8 December 2016
Potsdam / Berlin, Germany
http://www.agiletestingdays.com/

## Did you get your Personal Development Plan email with suggested potential CPD activities?

The BCS Personal Development Plan (PDP) uptake is going well, with thousands of registered users already actively recording their CPD Development Goals, Activities and preferences. It's not just about recording details though, as there is a Resources section that shows live feeds of potential CPD activities, and a tailored email is sent every 2 months with details of the latest videos, articles, blogs, books and research in your specified field of interest. If you haven't registered yet, you can see the content from the latest PDP bulletin for topics relating to solution development and implementation here http://www.bcs.org/content/ConWebDoc/50854 or by going to the CPD Portal at:  http://www.bcs.org/pdp/.

The BCS Personal Development Plan is free to use; BCS members can use their Member Secure Area login and password to access it at https://pdp.bcs.org/, and non-members can use most of the facilities (using the same link) and registering to create their own user name and password. You can use it on a PC / laptop or compatible tablet PC or smartphone.

**Specialist Group in Software Testing**

# THE TESTER

## SIGiST Autumn Conference
## Thursday 15th September 2016

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### IN THIS ISSUE

### From the Editor

Welcome to the *SIGiST* and *The Tester* for September 2016.

What a line up we have for the September conference! Sponsored by Test Partners and Endava, we have a great selection of talks and workshops, from international speakers. Subjects covered include automated smart testing, test data, testing in the new world, testing in a changing world, DevOps and conflicts in teams. Come along and join in the discussions, and sign up for the hands-on workshops!

Look out for details of our 2017 conference dates and perhaps think about submitting a talk or workshop idea, or an article for The Tester.

Did you miss our BCS SIGiST conference in Manchester in April? "**Northern Lights**", a one-day event of conference presentations. We received good feedback from delegates attending, so let us know if you would be interested in having another event outside of London.

Phill Isles
The Tester Editor
phill.isles@bcs.org

### Conference Booking Instructions

To register online, please use the link below, or scan the QR code with your smart device. Please note the BCS booking system accepts multiple and third party bookings.

https://events.bcs.org/book/2047/

Join our Linked-In Group:

http://www.linkedin.com/groups?mostPopular=&gid=3466623

Follow us @SIGiST

# Conference Agenda

| Time | Session | |
|------|---------|---|
| 09:10 | **The BCS SIGiST Annual General Meeting 2016** | |
| 09:25 | **_Welcome – Stuart Reid, Chair, SIGiST_** | |
| 09:30 | Keynote<br>**_Automated smart test design and its applications in software transplantation, improvement and Android testing_**<br>Professor Mark Harman | |
| 10:30 | _Networking Session – Jen Wheeler, Networking Secretary, SIGiST_ | |
| 10:45 | Coffee , Tea & Refreshments | |
| **Morning** | **Presentations** | **Workshop** |
| 11:15 | **_Riding the wave – testing in the new world_**<br><br>Chris Cooper Bland, Endava | **_The Software Testing Clinic_**<br><br>Dan Ashby and Tony Bruce |
| 12:15 | **_Test Data, Information, Knowledge, Wisdom: the past present & future of standing, running, driving & flying_**<br>Neil Thompson | |
| 13:00 | Lunch in networking area<br><br>**_Vendor presentations 13:10- 13:40_**<br><br>Birds of feather discussion sessions, including Mark Harman on Android testing | |
| **Afternoon** | **Presentations** | **Workshop** |
| 14:00 | **_DevTestOps – Big Bang or Evolution?_**<br><br>John Stinson | **_Subway mapping - Test Progress Reporting in Agile Context_**<br><br>Derk-Jan de Grood, Valori |
| 14:45 | **_An overview of conflict in Software Engineering teams_**<br>John Karn | |
| 15:30 | Coffee, Tea & Refreshments | |
| 16:00 | Keynote<br>**_Testing: it's fundamental and it's changing_**<br>Derk-Jan de Grood, Valori | |
| 17:00 | **_Close - Stuart Reid, Chair, SIGiST_** | |

The SIGiST committee reserves the right to amend the programme if circumstances deem it necessary.
**Workshops will have limited places.**

**Specialist Group in Software Testing**

**The BCS Specialist Group in Software Testing**

# Notice of Annual General Meeting

Notice is hereby given that the Annual General Meeting of the BCS Specialist Group in Software Testing (SIGiST) will be held on Thursday 15th September 2016. The venue for this meeting will be the BCS, First Floor, The Davidson Building, 5 Southampton Street, London., WC2E 7HA.

## Agenda

❖ Welcome and Introductions

❖ Apologies for absence

❖ Minutes of the 2015 AGM (and matters arising)

❖ Reports
  - Chair
  - Treasurer
  - Standards Committee
  - Programme Secretary

❖ Committee elections
  - Secretary
  - Social Media Co-Ordinator

❖ To consider any nominated business

Items for inclusion on the AGM agenda should be emailed to maureen.shannon@bcs.org. Additions to the agenda must be received no less than fourteen days prior to the meeting. Nominations for committee posts should be submitted following the election process and should be emailed to maureen.shannon@bcs.org by 26th August 2016.

# SIGiST Election process

Elections will normally take place at the SIGiST Annual General Meeting (AGM) in September. In extraordinary circumstances (*e.g.* early resignation) the SIGiST committee has the power to invite someone to take on any of the vacant roles until either the AGM or an Extraordinary Meeting when the role will be filled using the election process described here.

Elections are required in two sets of circumstances:
1. Automatically after a SIGiST Committee member(s) has held a position for 3 years.
2. If a SIGiST committee member resigns before the completion of their 3 year tenure.

The basic process to be adopted for any election follows:

| Task | Timescales |
| --- | --- |
| When an election is to take place at an AGM the available positions should be announced. Otherwise, for an Extraordinary Meeting, an email will be sent to all registered email addresses on the SIGiST database announcing the election(s). | No later than 30 days prior to the election. |
| The name of any member accepting nomination for election or re-election as an Officer or as a Committee member should be submitted in writing to the Secretary, with an accompanying short manifesto (no more than a page of A4) describing what they expect to bring to the role, by two members of the Group and with the written consent of the nominee.  See the Member Group Rules for further details. | At least 20 clear days prior to the election (after this point no more applications will be accepted). |
| A list of applicants for each job is released to the SIGiST members via email together with their manifestoes. | At least 10 days prior to election. |
| Election takes place during AGM or Extraordinary meeting. | At the AGM or Extraordinary Meeting. |

| Rules |
| --- |
| 1. Each candidate may stand for as many positions as they want (and can vote for every position available – subject to items 4 and 5 below), but may only hold one position.  In the event that someone is elected to more than one position then they must immediately decide which position they wish to take up and vacate the other positions.  The second-placed candidates for the vacated positions are then elected to those positions. |
| 2. Should the nominations number equal to or less than the vacancies, the nominees will be deemed to have been duly elected without an election. |
| 3. A simple majority is required to be elected to a position. |
| 4. Only members as defined in Member Group Rules may vote. |
| 5. Voting is only allowed if the member is physically present at the AGM |
| 6. The formal voting process will take place on the day of the meeting (a simple show of hands). |

# Conference Sponsor



# Test Lab & Consultancy Services

Whether you're looking for a turnkey testing service or flexible resourcing to support your own testing team, Test Partners' Consultancy division and Test Lab in central London can provide all the testing resources and facilities you require.

## Test Lab

Our Test Lab in central London is designed to respond rapidly to testing requests, efficiently handling projects lasting from a few hours to many years.
We can support any development methodology, from waterfall to agile and can ramp the team size up and down as required.
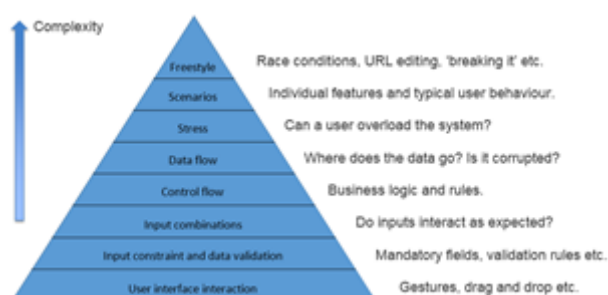
## Exploratory Testing

Since 2001 we have been the UK's leading exponents of exploratory testing and have developed a unique approach that is far more efficient and effective than scripted testing.



- Context – what are the available time, resources, risks, constraints, objectives etc.
- Inventory – what is there to test?
- Oracles – how do we know if it's right?
- Test plan – Risk-based. Lightweight and flexible
- Test approach – what tools and techniques will we use?
- Reporting – minimal but sufficient
- Management – ad-hoc, formal or session-based

From our "building blocks" to our 8-layer testing model, everything we do is driven by the context of each project, to maximise efficiency.



## Consultancy

Our Consultancy division supplies experienced test resources and proven processes to provide you with information about the quality of your software via on-site services including:

- Test Process Review / Health Check
- Strategy and Planning
- Test Management
- Test Analysis, Script Development and Execution
- Test Automation & Regression Testing

## Compatibility Testing

- Our comprehensive Compatibility Testing Lab facilities include a wide range of Windows and Mac hardware and software to enable testing on every end-user environment you could want.
- Every Microsoft and Apple operating system and service pack since 1995.
- Every version of popular browsers such as Internet Explorer, Firefox, Safari, Opera and Google Chrome.
- Every version of major plug-ins such as Flash Player, Shockwave, Adobe Reader, Windows Media Player, .Net Framework etc.
- Nearly 100 mobile devices.

## Accessibility Testing

We offer a comprehensive range of accessibility testing and consultancy services to support development projects from concept through to launch and maintenance.

- Concept review
- Wireframe review
- Creative design review
- Template (WCAG) testing
- Expert review with assistive technologies
- Final (WCAG) testing
- User testing with disabled participants
- Automated testing

## BS8878 Accessibility Governance



Our BS8878 governance programme is ideal for clients wanting to achieve and maintain the highest level of website accessibility.



## Accessibility Training

- JAWS Screen Reader Training
- WCAG Testing Training
- Accessibility Training for Project Managers

## UX Lab Hire

Situated in the centre of the City of London, our purpose built user testing study lab and observation room are available for hire.



The study lab has a top-end PC with microphones and cameras, while the observation room is a comfortable environment in which to watch the testing.

## London Open Device Lab

The Open Device Lab is a free facility for testers and developers to come and test the layout and behaviour of their mobile apps and websites on all our mobile devices.



We've got about 90 phones and tablets including all the popular Apple, Samsung and Google Nexus models. To make a booking, please email odl@testpartners.co.uk

## Find us on Procurement Portals

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enquiries@testpartners.co.uk

**Visit our stand at the SIGiST conference
Thursday 15th September 2016**

# Conference Sponsor





http://www.endava.com/

See our article "The changing world of software testing" by Mark Firth later in The Tester.

# SIGiST Conference Venue

The September 2016 SIGiST conference will be held at the BCS London office. Travel details and location below.

## London office guide

### How to get to the BCS London office

First Floor
The Davidson Building
5 Southampton Street
London WC2E 7HA

Telephone 01793 417666

These area and inset maps have been simplified in the interests of ease of understanding. Not all roads are shown. The inset map below is more accurate.

Access by car is very difficult due to the local one-way system. There are no car parking facilities at BCS London. The nearest car park is located on Drury lane, Parker Street, Parker Mews, London, WC2B 5NT.

The rear door in Exeter Street is to be used for deliveries only and is normally locked.

The main entrance is fully accessible to wheelchair users and should be used by all staff and visitors.

On arrival, report to the Davidson Building Reception who will direct you to the first floor.

### Travel tips from major London stations

**Charing Cross** – 6 minutes walk

**Waterloo** – 12 minutes walk across Waterloo Bridge, or buses 139 or 176 to Stop Ⓒ

**London Bridge** – onward rail link to Charing Cross

**Kings Cross or St Pancras** – Piccadilly Line to Covent Garden tube, or bus 91 to Stop Ⓑ

**Euston** – West End Branch of Northern Line to Charing Cross, or bus 91 to Stop Ⓑ

**Victoria** (rail and coach stations) – Circle Line to Embankment, but the most direct journey is via bus 11 to Stop Ⓐ

**Paddington** – Circle Line to Embankment or Temple, Bakerloo Line to Charing Cross or buses 15 or 23 to Stop Ⓐ

**Liverpool St** – Circle Line to Embankment or Temple, or buses 11 or 23 westbound

**Fenchurch St** – Walk to Tower Hill, then District or Circle to Embankment

# Presentation Abstracts and Speaker Biographies

## *Opening Keynote*

## Professor Mark Harman, UCL

### Automated smart test design and its applications in software transplantation, improvement and Android testing

This talk will review the existing state-of-the-art and practice in automated smart test case design. It will outline exciting emerging technologies that automatically "transplant" and "genetically improve" software, guided by testing. Transplantation transfers code from one system, a donor, into another unrelated system, the host, thereby transferring functionality from donor to host. Genetic improvement automatically improves operational characteristics such as execution time, memory requirements, and energy consumption.

We will see how transplantation and improvement can be guided by testing, offering breakthroughs in problems such as reuse, and the simultaneous satisfaction of multiple platforms, environments and stakeholders. The talk will conclude with recent results from a practical automated smart test design tool for Android, called Sapienz, which automatically achieves high coverage and fault revelation, while reducing the length of fault-revealing test sequences.

Three key learning points:
- We can automatically test android code
- We can automatically transplant functionality
- We can automatically improve existing systems

*Mark Harman is professor of Software Engineering in the Department of Computer Science at University College London, where he directs the CREST centre and is Head of Software Systems Engineering. He is widely known for work on source code analysis, software testing, app store analysis and Search Based Software Engineering (SBSE), a field he co-founded and which has grown rapidly to include over 1,600 authors spread over more than 40 countries. The UCL CREST centre, which celebrates its 10th anniversary in 2016, is widely regarded as one of the world's leading research centres in software testing. Its research is used by many organisations including Daimler, Ericsson, GCHQ, Google, Huawei, Microsoft and Visa.*

*Mark Harman has given over 30 keynote talks with various different conferences, both industrial and academic, ranging from small workshops of about 40 or 50 people, to large international events of over 500 participants.*

*Mark Harman is widely regarded as a world leading expert on software testing scientific results and research state-of-the-art.*

# *Closing Keynote*

## Derk-Jan de Grood
## Valori

### Testing: It's fundamental and it's changing

With the fast adoption of agile the definition of testing and our test approach changes. When deploying daily, there is no room for manual testing and a test report.  It's time to get back to our fundamentals. Why do we work the way we do, and what needs do organisations have?

In this Keynote, Derk-Jan de Grood will explore the fundamental assets of the test profession, so we can reshape or test approach and make it work in an Agile context.

Although the daily focus shifts from working in silo's to collaboration, from execution to coaching, from preparing to doing, the test fundamentals remain in place.  In our search we will distinguish unchanged artefacts that we'll create for a different reason and goals that remain unchanged but will only be achieved if we take a different route.  But bear in mind, not every project is done by using agile methods. Therefore we'll also explore what concepts of agile testing can we use to improve our traditional projects.

By understanding what is changed and what not we can adopt our approach, guide our stakeholders and colleagues in order to align testing with the company goals.

Three key points:

- Both agile and traditional projects are changing - testing needs to align
- We still need some of the same test fundamentals - but perhaps for a different reason
- We still have some of the same test goals - but we' need to achieve them in different ways.

*Derk-Jan de Grood works for Valori as senior test manager and agile coach. His drive is to improve the value of testing by sharing his knowledge and experience. He does this on the job, but also by means of training, presentations, workshops and publications. He is a serious game host and leads Agile simulation sessions with 450 participants. He is a regular speaker at conference like Seoul Testing Conference, EXPO:QA, Freetest and the STAR conferences in Europe and America. He has written several successful books on software testing & agile and frequently publishes articles and columns for the major testing magazines. On his own blog he shares his knowledge and experience for everyone to benefit. In 2014 he won the EuroSTAR testing excellence award. In 2015 he published the eBook: Agile in the real world, starting with Scrum.*

## *Morning Track Session*

# Chris Cooper-Bland
# Endava

## Riding the wave – testing in the new world

There has been a wave of new styles and patterns in architecture over the past few years, microservices, event driven, CQRS and responsive, to name a few.  These have largely been produced to cope with variability and the unknown, from very high volume unpredictable usage on the internet to very fast release of functionality in a continuous delivery environment.

What do these new styles and patterns mean to how you test the application, is there a similar revolution in the testing world?

This session will describe these architectures, discuss the challenges they address and when they should be used. Then we will explore some of the approaches to testing them, using audience interaction, to try and define some of the corresponding sets of testing styles and patterns.  The testing knowledge will come from the audience, so be prepared to contribute.

Three key points:

- Challenges of the digital world
- Description of modern Architecture styles
- Testing approaches in the new world

*Chris looks after the Architecture discipline at Endava and also works for clients on enterprise and solution architecture assignments, primarily in the financial services sector. She has worked throughout the product life-cycle from systems programmer, through analysis and design to project management. Her technical interests include: architecture best practice and how this can be shared across the industry, how enterprise architecture can be useful for developers and how to capture and solve the problems posed by challenging quality attributes.*

## *Morning Track Session*

# Neil Thompson

## Test Data, Information, Knowledge, Wisdom: the past, present & future of standing, running, driving & flying

Test data seemed to be the poor relation of the testing artefact family. We had standards and guidance on test strategies, plans, conditions, cases and scripts, with much to consider regarding structure, sequence, level of detail, techniques, format, *etc.* But then: "oh, and get some test data". Neil will add his personal advice from his long experience on a variety of projects (standing and running, contrived v lifelike, *etc.*), and summarise the apparent positions of agile (TDD, BDD, *etc.*) and Context-Driven testing on test data.

Then test data becomes even more interesting when we consider:
- testability of data structures *e.g.* data flows, entity relationships, entity life histories;
- object orientation;
- the data, information, knowledge & wisdom hierarchy; and
- information science *e.g.* entropy & evolution.

And test data is changing fast, driven by forces including:
- big data;
- cloud systems;
- internet of things.

Three key points:

- Test data is (are?!) more **fundamental** than you probably think.
- Test data is more **interesting** than you probably think, especially if you take a broader interest in data, information *etc.* as a science.
- Test data is **changing**!

*Neil Thompson has worked as an IT hardware salesman, programmer, systems analyst, project manager (not much), maintainer of live systems, and currently information systems consultant. He has spoken occasionally at conferences since 1993, and after ten years with a "big 6/5/4 firm" has been independent since 1998. He still loves and values being part of an international community of software testers.*

## *Morning Workshop*

# Dan Ashby and Tony Bruce

## Software Testing Clinic

The world of Software Testing can be confusing. There are many conflicting views about what testing is and there are so many different training events around. If you're new to testing, what do you do? Do you learn how to code and write automation, do you learn about Agile, should you be writing test scripts, and what is exploratory testing? Add into this the time and cost of training and it can all be quite a headache for you!

But knowing your craft is important and we at Software Testing Clinic believe that for a Tester to be the best they can be they should have a place to draw from the wealth of experience and knowledge the software testing community has to offer.

That's why the Software Testing Clinic offers a safe and open environment for people who are new to Testing to come along and ask questions, learn new skills, and get mentoring from experienced testers.

In our workshop at the SIGiST we will run a practical, hands-on, learning session for a small group of people new to testing. This enables you to return to the office the next day with enhanced skills. We'll work with you in small, mentored groups, answering the questions you bring, and showing you how to improve your craft.

Three Key Points:
- Learn what testing is and what it isn't
- What skills are needed to be a great tester
- An introduction to critical thinking skills

*Originally from Glasgow, **Dan Ashby** is the Deputy Practice Head within Lab49's Quality Practice in London. He's been testing for over a decade, working on a wide variety of products from printer software/hardware/firmware, to web and mobile apps and sites of all different shapes and sizes. Dan is passionate about context-driven testing and is currently focused on testing web-based software while coaching/training people in software testing and agile. Dan loves getting involved in the testing community and regularly speaks at conferences and meet-ups. He also blogs (danashby04.wordpress.com), is the co-host of the Testing in the Pub podcast series (testinginthepub.co.uk) and runs the Software Testing Clinic workshops within London (softwaretestingclinic.com). Follow Dan on twitter: @DanAshby04*

*Dan will be joined in presenting the workshop by **Tony Bruce**. Tony is a professional, experienced and constantly learning tester, with a strong background in support, a demonstrable track record of delivering customer satisfaction for leading blue chip companies and a proven ability to work in & lead large and small teams. He believes in a risk based, adaptable approach with the user experience in mind, and in working together as a focused team to achieve the target. He spends a large amount of personal time on increasing his skill set and keeping up to date with new tools and emerging testing trends.  Website: [http://dancedwiththetester.blogspot.com/](http://dancedwiththetester.blogspot.com/)*
*Twitter profile: [http://twitter.com/tonybruce77](http://twitter.com/tonybruce77)*
*Professional Profile: [http://www.linkedin.com/in/tonybruce](http://www.linkedin.com/in/tonybruce)*

## *Afternoon Track Session*



# John Stinson

## DevTestOps – Big Bang or Evolution?

The way software is being developed is changing significantly with the rise of DevOps. Build and deployment are increasingly automated, cloud usage is rising and the way metrics are being gathered is changing radically. John will discuss how testing and test automation are evolving, the speed of change and how we can adapt to thrive in this new world.

Three key points:

- DevOps approaches are revolutionising the software development lifecycle
- This creates new opportunities for testing and test automation
- How can we adapt as individuals to harness this change?

*John Stinson has worked in Software Development and Testing for the past 30 years. He has worked in the finance sector since 1994. During this time he has seen huge change in technology and industry. He currently works as a software test automation architect in a major investment bank.*

## *Afternoon Track Session*



# John Karn

## An overview of conflict in Software Engineering teams

Software engineering is a team based activity; success is to a large extent dependent on how well team members interact and cooperate with one another. A major issue to contend with during team activities is conflict. The traditional view of conflict is that it is a serious threat to teams both in terms of the relation-ship between members and on performance.

This presentation seeks to challenge this viewpoint and to present a more nuanced view of conflict in software engineering teams. Conflict is of a multi-faceted nature and is not necessarily destructive. This presentation will highlight that it is not conflict *per se* which is problematic, it is more the form and frequency which can have a bearing on the overall success of a project. Maybe if we accept conflict as fundamental we can change how we see it and use it a tool. There will be a brief discussion on how the methodology can have an impact on levels of conflict within teams with examples used from both industry and academia.

Three key points:

- Conflict is not necessarily an impediment to success
- There are different forms of conflict to consider
- The form and frequency of conflict has a bearing on whether the team is successful or not

*John is currently working in the financial sector for Lloyds Bank as a UAT test lead and has previous financial services experience of working as a system tester at Barclays.*

*Before embarking upon a career in industry his background was spent primarily in academia, first as a PhD student and then as a post-doctoral researcher. His research focused on human factors of software engineering and one of the areas of interest was conflict in teams. He completed MPhil and PhD degrees at the University of Sheffield as part of the Verification and Testing research group working closely in collaboration with the Institute of Work Psychology.*

*He has presented work at Empirical Software Engineering conferences such as EASE (Empirical Assessment in Software Engineering) and ISESE (International Symposium on Empirical Software Engineering), as well as internally for research colleagues.*

*He has software testing experience in both industry and academia and knowledge of the theory and research carried out which focuses on conflict in teams.*

*Afternoon Workshop*

# Derk-Jan de Grood, Valori

## Subway mapping – test progress reporting in an agile context

Test progress reporting can be cumbersome. There is a complex story to be told, but it needs to be done in such a way that the business and project Stakeholders get the message quickly and simply. Sequential planning techniques such as critical path analysis won't work in agile, but stakeholders keep asking for an indication of the progress so far, the work that remains, the bottlenecks and dependencies. Within my current project we solved this problem by introducing a visual progress report, the subway map.

Subway map reports are derived from the London tube map and contain the following elements:

1) Stations: Activities are represented as a station; they have a description of the benefit for the stakeholder upon completion.

2) Date lines provide status information (the train is expected on time, or not)

3) Bridges: Where two or more lines merge, you can define have a quality gate. They provide extra control on the progress (and of course to celebrate success).

In this workshop I will help you make your own subway map and explore how it can be used for your project, program, *etc*. Within my organization it has been adopted quickly by various projects, due to its simplicity and clearness. Business finally understood testing.

Three key points:

- Stakeholders need to understand test progress but don't have time for reading reports

- You can report test progress simply and visually on your project

- You can demonstrate progress to goals and quality gates easily

***Derk-Jan de Grood** works for Valori as senior test manager and agile coach. His drive is to improve the value of testing by sharing his knowledge and experience. He does this on the job, but also by means of training, presentations, workshops and publications. He is a serious game host and leads Agile simulation sessions with 450 participants. He is a regular speaker at conference like Seoul Testing Conference, EXPO:QA, Freetest and the STAR conferences in Europe and America. He has written several successful books on software testing & agile and frequently publishes articles and columns for the major testing magazines. On his own blog he shares his knowledge and experience for everyone to benefit. In 2014 he won the EuroSTAR testing excellence award. In 2015 he published the eBook: Agile in the real world, starting with Scrum..*

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## SIGiST White Paper Scheme

We have set up an area on the BCS website of a searchable repository for white papers and articles on testing and we are looking for contributors. That means you!

Do you have an existing paper you would like to repurpose and make more widely available through the SIGiST website?

- Then please send us the paper with three keywords for searching.

Would you like to write a new paper?

- Please send us the title and abstract together with the three keywords (or phrases)
- We will review the proposal and guide you through the authoring process
- For those who are thinking of speaking at SIGiST then this might be a good way to prepare a talk and get some useful feedback

If you have been thinking of writing or publicising an existing paper then this is the ideal opportunity. Please email your existing paper (with keywords) or your proposal to The Tester Editor, phill.isles@bcs.org

Past articles from The Tester will slowly be added to the repository as well.

Follow this link to the repository: http://www.bcs.org/category/18128

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## Write an article

We are always on the lookout for new content, so if you have a testing story you would like to share, a test technique you would like to evangelise or testing research you would like to publish, then The Tester is the place to do it. Simply email the Editor on phill.isles@bcs.org

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# The changing world of software testing

## Mark Firth,
## Head of Testing Services, Endava

I began my IT career in the late 80s, as a software developer, and after more than a decade, developing business systems, became a test consultant in 2001. I have spent the last 15 years in the world of testing and work for Endava as Head of Testing Services.

This article is based on my experiences and covers the evolution of testing which I have witnessed during my 25 year IT career. In particular the drive to increase quality and reduce cost and time to market through automation, delivery from low cost centres, the shift to agile and the effect of the millennium bug on the growth of testing.

In the late 80s and early 90s there were few professional testers. When we built software, most testing was conducted by the developers, there was little rigour and usually an absence of a formal test approach. We built simple test frameworks into our code to conduct unit/component testing, carried exploratory testing on each other's code and sometimes there was UAT and as a result many of the defects were found by the users.

In the early 90s automated testing tools appeared on the scene. The development team I worked in at the time trialled MS Test but we found it slowed down delivery and was too time-consuming so it was quickly abandoned. Instead we adopted Rapid Application Development (RAD) where we iteratively developed applications and delivered incremental change to the users with a limited amount of developer testing and UAT. This was reasonably successful because the users received regular updates with the features they most wanted and the low level of change between releases decreased the risk of serious issues.

It wasn't until the late 90s when widespread panic about the potential catastrophic effects of the millennium bug forced the whole industry to focus more closely on testing. At this point I was working as a software developer and over a 12 month period spent one month developing and eleven months analysing code and testing, including building an automated regression test pack using Rational Robot. We approached the 1st Jan 2000 listening to news warnings that systems would fail and planes would fall out of the sky, but when the clock ticked over most companies had thoroughly tested their software and there were few issues.

The testing for the millennium bug seems to have been the stimulus that the industry needed to take testing more seriously, and at this time independent testing consultancies began to appear and grow rapidly along with internal testing organisations and Test Centres of Excellence (TCoE's) being set up in some companies. The amount of money spent on testing as a percentage of total IT spend has grown continually since 2000 and is forecast to grow further due to an increasing focus on quality and the ever increasing complexity of systems.

In 2001 while working as a test consultant, for an investment bank, I first came in contact with offshore testing based in India. At that time many large organisations set targets for transitioning testing work offshore in order to reduce costs and increase the amount of testing.

The testing was usually conducted late in the development lifecycle with a high proportion of manual testing effort. This was a trend which was to gain momentum and expand to other lower cost offshore locations driven by procurement departments looking for the lowest cost per testing head.

At roughly the same time agile practices also started to appear and in 2002 I worked as a test engineer on my first agile project (XP) and saw a different way to do testing, building quality into the early lifecycle with automated functional and performance acceptance tests growing alongside development.

Over the next few years agile practices became increasingly popular and where implemented properly led to the successful delivery of high quality software. In some organisations however the importance and value of test engineering and test automation in the agile process were not recognised and this (among other things) often resulted in the organisation reverting back to more traditional delivery models with a focus on moving more testing to offshore locations to reduce costs.

Many firms also found that the combination of agile and offshore was hard to implement successfully and began to explore other options closer to home. In the mid-2000s many organisations started to invest in lower cost locations in Central and Eastern Europe to harness the high level of engineering skills available and the closer time-zone, a strong combination which provides the platform to successfully deliver distributed agile.

In recognition of this in 2006 Endava set up its first delivery units in Romania and Moldova specialising in agile development and investing heavily in building a testing practice capable of delivering successful testing in an agile environment with a focus on test engineering and test automation skills. Ten years on Endava is now 3,000 strong with 700 testers experienced in delivering testing in an agile environment and is pushing forward with continuous delivery and DevOps.

Alongside agile development Endava delivers testing services to help organisations transform their testing to enable successful agile delivery.



**MARK FIRTH**
HEAD OF TESTING
SERVICES, ENDAVA

endava

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# BCS SIGiST 2016 and 2017, your invitation

## Isabel Evans, SIGiST Programme Secretary

### Autumn: Thursday 15th September 2016

Booking now open: http://www.bcs.org/category/9264

See above for the programme

### Winter: Wednesday 7th December 2016

BCS 1st Floor, Davidson Building 5 Southampton Street London WC2E 7HA

### Challenge yourself!

At the December conference our speakers will challenge you and we ask you to challenge yourselves.

Keynotes: Mieke Gevers discusses the challenges of performance testing and Antony Marcano asks: 2017 - what technical challenges do we face?

Other full length presentations:

- Steve Watson discusses Challenges for TMs in changing roles
- Bob Stickland IT Programme Leader T3/T5 Heathrow presents Heathrow Terminal X - the testing challenges
- David Oxley Intel presents security challenges

Dr Stuart Reid hosts a Test Design Challenge Workshop.

We have four short talks on a variety of topics from our new speakers.

Your chance to raise a debate: we'll hold some slots for on-the-day Soap box sessions - book to speak on the day - 5 mins each!

The SIGiST committee reserves the right to amend the programme if circumstances deem it necessary. Workshops will have limited places.

# 2017

We have two confirmed London dates for 2017, 14<sup>th</sup> March and 14<sup>th</sup> June. So put them in your diary and request the budget to come!  Other dates for London and regional conferences are also being organised.

We are planning the programme, so if there is a topic or speaker you'd like covered please let us know via the SIGiST website. We are particularly interested in future challenges for testing, 4th Industrial Revolution and coming trends, but we also want some sessions on the here and now. Got a story you'd like to tell? Got a topic you'd like covered? Tell us!

## Do you want to speak at events?

We now have a nearly full programme for 2016, and I am planning 2017.  If you want to speak, please apply at http://www.bcs.org/category/10880, or let us know ideas for topics and speakers you'd like to see at the SIGiST.

## Do you want to sponsor events?

If your company works in these areas providing tools, software or consultancy / training you might want to sponsor an event, if so please contact Hiedi Homan via
http://www.bcs.org/upload/pdf/sigist-vendor-information-sheet.pdf

*The SIGiST committee reserves the right to amend the programmes if circumstances deem it necessary. Workshops in will have limited places.*

# Event Listings

If you would like your event listed here, please contact the Editor phill.isles@bcs.org

## 2016

### September

**SIGiST**
15 September 2016
London, UK
http://www.bcs.org/server.php?show=nav.9264

### October

**STARWEST**
2 – 7 October 2016
Anaheim, US
http://starwest.techwell.com/

**EuroSTAR**
31 October – 3 November 2016
Stockholm, Sweden
http://www.eurostarconferences.com/

### December

**Agile Testing Days**
5 – 8 December 2016
Potsdam / Berlin, Germany
http://www.agiletestingdays.com/

### December

**SIGiST**
7 December 2016
London, UK
http://www.bcs.org/server.php?show=nav.9264

## 2017

### March

**SIGiST**
14 March 2017
London, UK
http://www.bcs.org/server.php?show=nav.9264

### June

**SIGiST**
14 June 2017
London, UK
http://www.bcs.org/server.php?show=nav.9264

## Did you get your Personal Development Plan email with suggested potential CPD activities?

The BCS Personal Development Plan (PDP) uptake is going well, with thousands of registered users already actively recording their CPD Development Goals, Activities and preferences. It's not just about recording details though, as there is a Resources section that shows live feeds of potential CPD activities, and a tailored email is sent every 2 months with details of the latest videos, articles, blogs, books and research in your specified field of interest. If you haven't registered yet, you can see the content from the latest PDP bulletin for topics relating to solution development and implementation here http://www.bcs.org/content/ConWebDoc/50854 or by going to the CPD Portal at:  http://www.bcs.org/pdp/.

The BCS Personal Development Plan is free to use; BCS members can use their Member Secure Area login and password to access it at https://pdp.bcs.org/, and non-members can use most of the facilities (using the same link) and registering to create their own user name and password. You can use it on a PC / laptop or compatible tablet PC or smartphone.

**Specialist Group in Software Testing**

# THE TESTER

## SIGiST Winter Conference
## Wednesday 7th December 2016

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**IN THIS ISSUE**

### From the Editor

Welcome to the *SIGiST* and *The Tester* for the last time in 2016. The Winter conference is almost upon us, and again, what a great line-up we have. Along with our usual mix of internationally-renowned speakers and practitioners with high industry experience, we have our new speakers, as part of the SIGiST mentoring programme. Come along and support them, or sign up as a new speaker for next year - Challenge yourself!

Sponsored by Test Partners, subjects covered on the day will include Agile and Performance Testing; Seamless Integration - the challenge of Heathrow Airport; challenges for Test Managers in changing times; and Technical Challenges for 2017…. There will also be a very hands-on workshop on Test Case Design.

Did you miss our BCS SIGiST conference in Manchester in April? "*Northern Lights*", is back! A one-day event is planned for **Leeds** in February 2017. See page 17 for details. Plans are also in place for another Manchester event in 2017.

Phill Isles
The Tester Editor
phill.isles@bcs.org

### Conference Booking Instructions

To register online, please use the link below, or scan the QR code with your smart device. Please note the BCS booking system accepts multiple and third party bookings.

https://events.bcs.org/book/2116/

Join our Linked-In Group:

http://www.linkedin.com/groups?mostPopular=&gid=3466623

Follow us @SIGiST

# Conference Agenda

| BCS SIGiST – Winter 2016 Conference – Wednesday 7th December 2016 |
| --- |
| **BCS 1st Floor, Davidson Building, 5 Southampton Street, London. WC2E 7HA.** |

## *Challenge yourself!*

| Time | Session | |
| --- | --- | --- |
| **09:25** | *Welcome – Geoff Thompson, Vice Chair, SIGiST* | |
| **09:30** | Keynote<br>*"Agile and Performance Testing"? A Contradiction in Terms?*<br>Mieke Gevers AQIS | |
| **10:30** | *Networking Session – Jen Wheeler, Networking Secretary, SIGiST* | |
| **10:45** | Coffee , Tea & Refreshments | |
| **Morning** | **Presentations** | **Workshop** |
| **11:15** | **New Speaker Mentoring Scheme 2016**<br>• *"Automated Testing - What I have learned (The Hard Way)"* Andy Shaw<br>• *"Testing: The Scenic Route"* Cassandra Leung<br>• *"The first 6 weeks, managing a team when you feel like you know nothing!"* Gwen Stewart<br>• *"The Agile Cycle"* Tunde Oduniyi | *Test Case Design – by doing it*<br><br>Dr Stuart Reid |
| **12:30** | Lunch in networking area<br>Soap box sessions – on the day 5 mins each<br>**Videos or Vendor presentation in main room 12:50- 13:20** | |
| **Afternoon** | **Presentations** | **Workshop** |
| **13:30** | *Seamless Integration: the challenge of Heathrow*<br><br>Bob Stickland<br>IT Programme Leader T3/T5<br>IT Systems & Operational Integration Leader, Heathrow | *Test Case Design – by doing it*<br>*(continued)*<br><br>Dr Stuart Reid |
| **14:15** | *Challenges for TMs in changing roles*<br><br>Steve Watson, Test Manager<br>Reed Business Information | |
| **15:30** | Coffee, Tea & Refreshments | |
| **16:00** | *Keynote*<br>*2017 – The Technical Challenges Ahead*<br>Antony Marcano | |
| **17:00** | *Close - Geoff Thompson, Vice Chair, SIGiST* | |

The SIGiST committee reserves the right to amend the programme if circumstances deem it necessary.
**Workshops will have limited places.**

# Conference Sponsor


**Test Partners**

## Test Lab & Consultancy Services

Whether you're looking for a turnkey testing service or flexible resourcing to support your own testing team, Test Partners' Consultancy division and Test Lab in central London can provide all the testing resources and facilities you require.

## Test Lab

Our Test Lab in central London is designed to respond rapidly to testing requests, efficiently handling projects lasting from a few hours to many years.
We can support any development methodology, from waterfall to agile and can ramp the team size up and down as required.
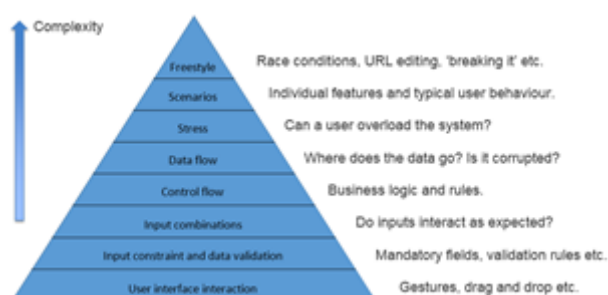
## Exploratory Testing

Since 2001 we have been the UK's leading exponents of exploratory testing and have developed a unique approach that is far more efficient and effective than scripted testing.



- Context – what are the available time, resources, risks, constraints, objectives etc.
- Inventory – what is there to test?
- Oracles – how do we know if it's right?
- Test plan – Risk-based. Lightweight and flexible
- Test approach – what tools and techniques will we use?
- Reporting – minimal but sufficient
- Management – ad-hoc, formal or session-based

From our "building blocks" to our 8-layer testing model, everything we do is driven by the context of each project, to maximise efficiency.



## Consultancy

Our Consultancy division supplies experienced test resources and proven processes to provide you with information about the quality of your software via on-site services including:

- Test Process Review / Health Check
- Strategy and Planning
- Test Management
- Test Analysis, Script Development and Execution
- Test Automation & Regression Testing

## Compatibility Testing

- Our comprehensive Compatibility Testing Lab facilities include a wide range of Windows and Mac hardware and software to enable testing on every end-user environment you could want.
- Every Microsoft and Apple operating system and service pack since 1995.
- Every version of popular browsers such as Internet Explorer, Firefox, Safari, Opera and Google Chrome.
- Every version of major plug-ins such as Flash Player, Shockwave, Adobe Reader, Windows Media Player, .Net Framework etc.
- Nearly 100 mobile devices.

## Accessibility Testing

We offer a comprehensive range of accessibility testing and consultancy services to support development projects from concept through to launch and maintenance.

- Concept review
- Wireframe review
- Creative design review
- Template (WCAG) testing
- Expert review with assistive technologies
- Final (WCAG) testing
- User testing with disabled participants
- Automated testing

## BS8878 Accessibility Governance



Our BS8878 governance programme is ideal for clients wanting to achieve and maintain the highest level of website accessibility.



## Accessibility Training

- JAWS Screen Reader Training
- WCAG Testing Training
- Accessibility Training for Project Managers

## UX Lab Hire

Situated in the centre of the City of London, our purpose built user testing study lab and observation room are available for hire.



The study lab has a top-end PC with microphones and cameras, while the observation room is a comfortable environment in which to watch the testing.

## London Open Device Lab

The Open Device Lab is a free facility for testers and developers to come and test the layout and behaviour of their mobile apps and websites on all our mobile devices.



We've got about 90 phones and tablets including all the popular Apple, Samsung and Google Nexus models. To make a booking, please email odl@testpartners.co.uk

## Find us on Procurement Portals

**G-Cloud**
www.digitalmarketplace.service.gov.uk/g-cloud/search?q="Test+Partners+Ltd"

**Ariba**
discovery.ariba.com/profile/AN01011471333

www.testpartners.co.uk
0800 612 2780
enquiries@testpartners.co.uk

**Visit our stand at the SIGiST conference
Wednesday 7th December 2016**

# SIGiST Conference Venue

The December 2016 SIGiST conference will be held at the BCS London office.
Travel details and location below.

## London office guide

### How to get to the BCS London office

First Floor
The Davidson Building
5 Southampton Street
London WC2E 7HA

Telephone 01793 417666

These area and inset maps have been simplified in the interests of ease of understanding. Not all roads are shown. The inset map below is more accurate.

Access by car is very difficult due to the local one-way system. There are no car parking facilities at BCS London. The nearest car park is located on Drury lane, Parker Street, Parker Mews, London, WC2B 5NT.

The rear door in Exeter Street is to be used for deliveries only and is normally locked.

The main entrance is fully accessible to wheelchair users and should be used by all staff and visitors.

On arrival, report to the Davidson Building Reception who will direct you to the first floor.

### Travel tips from major London stations

Charing Cross – 6 minutes walk

Waterloo – 12 minutes walk across Waterloo Bridge, or buses 139 or 176 to Stop Ⓒ

London Bridge – onward rail link to Charing Cross

Kings Cross or St Pancras – Piccadilly Line to Covent Garden tube, or bus 91 to Stop Ⓑ

Euston – West End Branch of Northern Line to Charing Cross, or bus 91 to Stop Ⓑ

Victoria (rail and coach stations) – Circle Line to Embankment, but the most direct journey is via bus 11 to Stop Ⓐ

Paddington – Circle Line to Embankment or Temple, Bakerloo Line to Charing Cross or buses 15 or 23 to Stop Ⓐ

Liverpool St – Circle Line to Embankment or Temple, or buses 11 or 23 westbound

Fenchurch St – Walk to Tower Hill, then District or Circle to Embankment

# Presentation Abstracts and Speaker Biographies

## *Opening Keynote*

### Mieke Gevers, Aquis

"Agile and Performance testing"?
A Contradiction in terms?

Does performance testing fit into an agile world? If so, where should it be?

In Agile software development, an iteration (called a sprint) is a single development cycle, usually measured as one week or two weeks. Traditionally, Performance Testing starts off with Unit testing (if not before) and ends with the UAT-user acceptance test (if not later).

The questions that we should ask ourselves are: "What are the challenges, pros and cons of running performance tests within an Agile development cycle?", "Does it make sense to unite agile approaches and performance testing?" and "Can performance testing help organisations to develop higher quality software in less time while reducing development costs?"

As a senior test engineer, performance engineer and automated tools specialist, Mieke will share her experience with you, including her reflections, insights and challenges when doing performance testing within Agile projects. Learn from someone who has been there, done it, faced the challenges. Mieke will share insights and lessons learned from recent projects doing performance testing in an Agile environment.

*Mieke has been in the IT industry for 22 years and is managing director at Aqis. She is a Bachelor of Computer Science and started her career as a software developer, later moving on to various positions as analyst, project manager and, ultimately, QA Manager for several different companies in the Benelux region and Germany. Until November 2006 she was with Segue Software, Borland for more than eight years rising from Technical Sales Engineer, Technical Manager, EMEA/APAC, Alliance Architect EMEA/APAC to Solution Architect, EMEE at Borland.*

*Having developed a special interest in the techniques and processes related to test environment management and the impact of environmental factors on automated testing, she has been working with different automatic testing tools, specialising in performance testing and monitoring. She remains a practical, hands-on technical tester, working at the coal-face of projects.*

*Mieke is a regular speaker throughout Europe, the United States, Asia and Australia. She was a member of the programme committees for EuroSTAR's 2007 & 2009 & SEETest 2009 and she is currently Program Chair of Belgium Testing Days, 2011-2016. In 2006, she co-founded "the Belgian Testers Organisation" and she is board member of KVIV and BNTQB and the International Representative at ISTQB.*

# *Closing Keynote*



## Antony Marcano, RiverGlide

### 2017 – The Technical Challenges Ahead

Technology seems to be advancing faster than ever with ever-increasing variety. New technologies interact with each other creating emergent and hard-to-predict behaviours. Mainstream testing is unlikely to suffice in a technological landscape that is becoming increasingly complex. From connected climate control devices in our homes to autonomous vehicles – much is crossing the chasm from the early adopters into the early majority…

More of us will face new, exciting, and potentially overwhelming challenges as a result. In this talk, Antony explores what these challenges will be in 2017.

*Antony Marcano has over 20 years in technology and is co-founder of RiverGlide – an innovation and agile product development consultancy. He spends as much time as a practitioner as he does as a coach, consultant or trainer, sharing his experiences with the community in various ways: including as a contributor to books such as Agile Coaching and Agile Testing, with references in Bridging the Communication Gap, and Software Craftsmanship Apprenticeship Patterns. His work in the community continues as a regular guest speaker to post-graduates in Software Engineering at Oxford University and as a regular speaker on agile development & testing at international conferences.*

*Morning Track Session*

*Short talks by New Speakers*

The BCS SIGiST New Speaker Mentoring Scheme provides testers who wish to start public speaking with an experienced mentor who guides them in abstract writing, preparing a presentation and delivering a short talk.  Being able to present to an audience is skill useful to all testers.  Our four mentees this year are Andy Shaw, Cassandra Leung, Gwen Stewart and Tunde Oduniyi.

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# Andy Shaw
## Automated Testing - What I have learned (The Hard Way)

In this presentation, Andy Shaw talks about some of the automated testing that he has undertaken, the challenges that he (and others) face when automating tests, and understanding how automated testing can add value to software testing.

The automated tests were created for a Geological software system, where there were no tools that were directly applicable, so he had to approach the automation in a different way. Andy explains what worked and what didn't work, and what he learned from these challenges, as well as the successes achieved with the automated testing.

He concludes by explaining how the automated testing has added value, and gives advice and guidance about the questions to ask when looking to automate tests for a software, mobile or web based system.

*Andy Shaw is a Software Testing Professional, gaining experience in software development, software support, focusing on a career in Software Testing.  He graduated from Sheffield Hallam University and has worked in different companies including Total Systems Plc, EDS, Hewlitt-Packard, Schlumberger and currently works as a software tester in DBIS.*
*He is actively involved with the British Computer Society, mentoring professionals embarking on a career in the IT Industry, including students, young professionals, women and people with disabilities, and is a Young Professionals Group representative and the Vice-Chair of the South Yorkshire BCS branch.*
*He continually develops his knowledge and experience of software testing, the IT industry and the different industries he has tested software for, including Defence, Geology and the Cargo and Shipping Industries.*

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*Morning Track Session*

*Short talks by New Speakers*

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# Cassandra Leung
## Testing: The Scenic Route

How do you become a tester?  How do you test software?  How do you find bugs? Are these questions to which one can provide straight-forward answers?  Are the straight-forward answers the best? In this session, our speaker will share how having a career in the recruitment industry has allowed her to become a better tester and build valuable relationships with users – and a rather unusual relationship with her CEO.  We'll consider the importance of scrutinising existing features in the product, using feature improvements as an opportunity to do so, and how failing to do this could mean uncovered risk to the business.  We'll also look at other aspects along the "scenic" development lifecycle and how taking the time to explore these can contribute to improved software quality.

Three Key Points:

• A career before testing brings value and insight
• Existing features can harbour risk to the business
• The end isn't enough - the journey matters too

*Cassandra's official job title is UX Ninja; this encompasses her many responsibilities, including testing, UI design, requirements gathering and representing users.  Having had a career in sales and recruitment and now working at a recruitment software firm, user experience is always on her mind when testing and making product decisions.  Cassandra aims to use her past experiences to help make positive, user-focussed decisions, and share her new experiences with others in the testing community.*

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*Morning Track Session*

*Short talks by New Speakers*

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# Gwen Stewart
## The first 6 weeks, managing a team when you feel like you know nothing!

Imagine the end of your first week in a new job. You've found out where the coffee is, you've got a "new to you" desk / laptop / view and you can nearly remember everyone's names. You've seen how the team is working, found out the things they didn't tell you in the interview and answered too many questions with some variation on "I'm new here, what do you think?"

Gwen will reflect on this:

> "So at the end of that week I'm thinking, what now? I've realised that the people asking my opinion on prioritising that exciting looking bug know much more about it than I do. There hasn't been anyone in my role for 6 months and things look fine, in fact better than the place I just left. I'm never going to learn ALL those TLAs! Everyone else seems so much cleverer than me. In fact, why am I here at all?"

In this talk Gwen would like to share her experiences of dealing with the first few months in a new role, some tools that she finds useful and some tips for dealing with the feeling that you are an imposter.

*Gwen has been working in IT for the last 19 years with 12 years as a test manager. In that time, she has moved from working on waterfall legislative projects to agile projects for a range of e-commerce and digital broadcasting companies. Specifically, she's worked on a number of large, integration projects and had to transition from how these work in a V-model structure to fit to agile and CD practices. She's passionate about IT and although 4-5 years ago she would have said that she was passionate about testing, she'd now say, based on her agile experiences that she is passionate about software delivery. Currently working at the BBC as QAM for myBBC personalisation services, she still manages to get hands on with testing though and says that is the best part of the job.*

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*Morning Track Session*

*Short talks by New Speakers*

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# Tunde Oduniyi
## The Agile Cycle

For a child, learning to ride a bicycle is a leap into the unknown; a magical mastery of control if accomplished without any bruises, can be a liberating experience. It's no easy feat getting steady on the bicycle pedals hanging between two rotating wheels. Mastering cycling basics can put pressure on a child. Cycling is simply utilizing body weight movement and small manoeuvres of the bicycle handlebars in and out of turns this is
similar to walking which consists of small falls counteracted by constant regulated recoveries. The world of Agile is similar to bicycle-riding in that it takes time to get things right, just like the mastery of any process or skill. The learning process involves failing, re-learning and ultimately creating a winning formula which evolves beyond textbook practices in order to develop into a highly functional team. This presentation aims to introduce Agile methodology through the lens of learning to ride a bike.

*Tunde is a Quality Assurance Engineer with experience in overseeing the development process of e-commerce web and mobile applications in the retail and payments industry.*
*Tunde is passionate about all things mobile and disruptive technologies. and loves getting involved with the community. He is here today to introduce us to Agile.*

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Thank you to this year's New Speaker mentors, Dot Graham, Julian Harty, Graham Thomas and Mieke Gevers, without whom the scheme would not have been possible.

The New Speaker Mentoring Scheme 2017
opens for applications shortly after the December SIGiST

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*Workshop*

# Dr Stuart Reid

## Test Case Design - by doing it

Workshop is in the morning 11:15 – 12:30 and continues in the afternoon 13:30 – 15:30

Test case design is a fundamental skill for a practicing tester.  It requires the tester to move from an infinite number of possible tests to a tiny subset which can be managed in the all too finite timeframe of a real project.  The secret is to select the most effective subset that will give you the most information about the software under test.  This is the challenging, skilful and intellectually-demanding task of effective test case design.

This short workshop provides a new way of learning about the most popular and useful test design techniques.  It is highly interactive, allowing attendees to gain practical experience in creating and executing test cases, while learning from the experience of the instructor and each other.  However, the special ingredient is that for each technique covered, attendees will be able to actually execute their tests against real programs specifically created for this course, which will provide immediate feedback on how 'good' your tests are.

**To get the most benefit from this workshop, you should bring a laptop so that you can run your tests on actual software (so you need the ability to load software on the machine).**

Three key points:

Understand the basics of the most popular test case design techniques
Learn how to design test cases by actually doing it
Get immediate feedback on your tests from the programs under test

*Stuart Reid is Chief Technology Officer at STA Test Consulting & CONKRIT, working about a third of the year in Korea.  He has over 33 years' experience in the IT industry, working in development, testing and education, and has a PhD in the area of test case design.  Application areas range from safety-critical to financial and media.  Stuart supports the worldwide testing community in a number of roles. He is convener of the ISO Software Testing Working Group, which developed the new ISO 29119 Software Testing standards, and founded the International Software Testing Qualifications Board (ISTQB) to promote software testing qualifications globally*

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# Lunchtime sessions

We have several bonus sessions during lunchtime, 12:30 to 13:30.

## Vendor presentation

In the main room from one of our sponsors.

## Birds of a feather session 1: improve your networking

As requested by SIGiST delegates, a chance to improve your networking skills and discuss how to get the best of SIGiST meetings (facilitated by a SIGiST Committee member).

## Birds of a feather session 2: making do with what we have

As requested by SIGiST delegates, a chance to discuss tactics for dealing with traditional organisations, and how to work well with the tools, methods and structures that we have, Share experiences and ideas (facilitated by a SIGiST Committee member).

## Have your say / soap boxes.

Depending on demand, we hope to run a "soap box" at lunch time – 5 minutes to share an idea in the networking area. Bring your idea and take your turn.

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## *Afternoon Track Session*



# Bob Stickland

## Seamless Integration: the challenge of Heathrow

Bob will present the challenges of working at Heathrow and the approach used to balance the testing of systems, people and process within the highly critical multi-vendor environment.

> "There is no BaU at Heathrow, every day as its own challenges for our Operational teams and the supporting functions, including IT. Change is the 'norm' in this high availability public facing organisation. Having worked in the airline industry for 20 years my focus goes beyond standard IT testing to provide integrated systems that support our operational trails and people training.
>
> With the introduction of a brand new terminal 2 in 2014, a fabulous state of the art integrated baggage handling system in T3 in 2015 we are working ever harder to provide integrated, tested and proven IT systems that support our operation, airlines and passengers. Only by truly focusing on making every journey better can we achieve our vision of providing the best airport service in the world."

Three key points:

- Collaboration with Project teams & Stakeholders
- Introduce new technology with consideration
- Focus on Outcomes & not the Technology

*Bob is an IT Programme Leader with over 25 years of experience in IT and delivery large infrastructure change projects and programmes.*

*His role is to ensure the successful outcomes of infrastructure change programmes at Heathrow across all the terminals and works as part of the IT Programme Delivery leadership team. He is also accountable for Test Assurance across all IT projects and has a passion for systems and operational integration.*

*Business change is more than delivering a new IT capability that has been through testing, that is just brilliant basics. To maximise the benefits from Day 1 systems need to be tested with our people, process and environment ensuring all inter-dependencies are careful thought through, tested, trialled and executed. The purpose of seamless integrated is to provide 'quiet' go lives into our terminals.*

*A chance to cast your mind beyond the absolute requirement of systems testing and think about the seamless integration of environment, process and people supported by quality tested and reliable IT systems.*

## *Afternoon Track Session*

# Steve Watson

## Challenges for Test Managers in Changing Roles

Steve will present and lead a discussion on the challenges for test managers.
**Be ready to contribute and learn from each other!**

"I have been in testing for 28 years and a Test Manager for over 8 years of my long career. The talk over the past few years about the future of Test Managers in an Agile world has been both interesting and alarming as I may have worked my way up to a role that will no longer exist in 5 years!

I was given the opportunity to try something different alongside my TM role in 2015, and I grabbed the opportunity, even though it took me outside of my comfort zone. I want to share my experience of delivering a brand new product to market, despite having no track record in this area, the lessons I learned, new skills developed and old skills sharpened.

We will have an open discussion about the Test Management skills we possess that could help us diversify into other roles, and about possible career paths for existing Senior Testers and Lead Testers."

Three key points:
• Change is inevitable – so be prepared.
• Identify the skills you have that can be transferred to other roles, and skills you need to develop.
• Be open minded about other possibilities where a testing background can be advantageous.

*Steve is an ISTQB certified test manager with over 28 years of experience in Banking, Futures & Options Trading, Vehicle Leasing, Automotive Information and B2B publishing.  His role combines being a Test Manager with Product Management for a leading brand within Reed Business Information, part of RELX, a FTSE 100 company.  He manages a team of 9 permanent testers, directing the overall testing strategy and approach across a number of projects.*

*Within RBI, he co-runs a 'QA Chapter' bringing 60 global testers together from different RBI brands to encourage knowledge sharing. Externally he speaks at conferences, assists with Test Management Forums, writes magazine articles and blogs here - http://stevethedoc.wordpress.com/.  In June 2014 he was a 'Topic Guru' at the Next Generation Test Conference.  In April 2016 he presented a session on Diversification for Test Managers at the UKTMF.*

*With 8 years Test Management experience, he has first-hand experience of diversifying his role to pick up Product Management alongside testing responsibilities, so this session is a case study and discussion.  This is an opportunity to look at the future for those in Test Manager roles or for Senior Testers looking at career progression.  What is the future for Test Managers?  What challenges are we facing?  How can we diversify our roles into other areas and use our testing skills?  These are some of the discussion points that will be covered in Steve Watson's session.*

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# SIGiST White Paper Scheme

We have set up an area on the BCS website of a searchable repository for white papers and articles on testing and we are looking for contributors. That means you!

Do you have an existing paper you would like to repurpose and make more widely available through the SIGiST website?

- Then please send us the paper with three keywords for searching.

Would you like to write a new paper?

- Please send us the title and abstract together with the three keywords (or phrases)
- We will review the proposal and guide you through the authoring process
- For those who are thinking of speaking at SIGiST then this might be a good way to prepare a talk and get some useful feedback

If you have been thinking of writing or publicising an existing paper then this is the ideal opportunity. Please email your existing paper (with keywords) or your proposal to The Tester Editor, phill.isles@bcs.org

Past articles from The Tester will slowly be added to the repository as well.

Follow this link to the repository: http://www.bcs.org/category/18128

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# Write an article

We are always on the lookout for new content, so if you have a testing story you would like to share, a test technique you would like to evangelise or testing research you would like to publish, then The Tester is the place to do it. Simply email the Editor on phill.isles@bcs.org

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## BCS West Yorkshire and BCS Specialist Group in Software Testing
## Proudly present the Leeds "Northern Lights" Conference
## Thursday 9th February 2017

In association with the BCS West Yorkshire Branch, the SIGiST is bringing its successful full day conference programme to the Leeds Marriott, on Thursday 9th February 2017.  To book this conference go to https://events.bcs.org/book/2332/

### Conference Programme

| Time | Topic, Speaker, Affiliation |
|---|---|
| 08:30 | Coffee, registration and informal networking |
| 09:00 | Welcome from **Stephen Allott**, BCS SIGIST committee |
| 09:15 | A not-so Unexpected Journey: end to end Healthcare Testing, **Monica Jones**, MD Animo |
| 10:15 | The 4th Industrial Revolution and Smarter Testing, **Dr Stuart Reid**, CTO STA Testing Consulting |
| 11:15 | Coffee/tea and networking break |
| 11:45 | Agile Testing: Challenges still to be conquered, **Pablo Garcia**, CEO Quality Point, Sweden |
| 12:30 | Lunch |
| 13:30 | Blunders in test automation, **Dorothy Graham**, Software testing consultant, speaker and author |
| 14:15 |  Is automating mobile testing pointless?  **Thomas Crabtree**, Head of service introduction, Ten10 |
| 15:00 | Coffee/tea and networking break |
| 15:30 | To infinity and beyond . . .  **Chris Ambler**, Independent |
| 16:00 | Meet the speakers – informal networking and Q&A |
| 17:00 | Summary and close, **Stephen Hill**, BCS SIGIST committee |

Please note:

Many sessions are designed to be interactive and audience participation is encouraged.

The committee reserves the right to alter the speakers, topics and timings for operational reasons on the day.
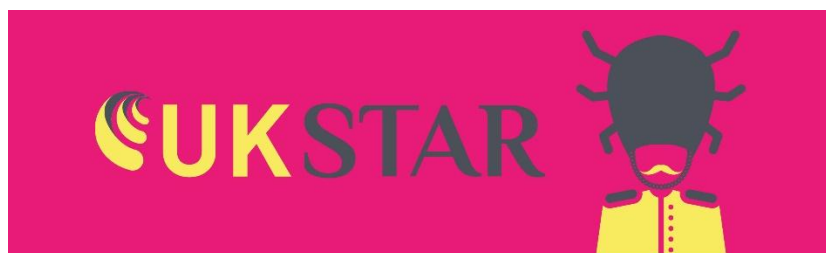
### Conference Venue

Leeds Marriott Hotel, 4 Trevelyan Square Boar Lane, Leeds, LS16ET.
www.LeedsMarriott.co.uk

EuroSTAR Conferences is delighted to announce the launch an exciting new software testing conference!

**UKSTAR Software Testing Conference will take place in the iconic County Hall, Westminster London from 27th – 28th February 2017.**



EuroSTAR held it's first testing conference in London in 1993 and now, 24 conferences later…we are thrilled to be returning to the British capital.

This new conference will featuring two jam packed days of insightful workshops, world class keynotes, awesome presentations, lively discussions, a buzzing Expo, welcoming social events and more.   Don't just take our word for it….first off lets meet our Keynotes…….

And you can take a look at check out the full line up of superb speakers [here](#)

If you are looking for a conference that will give you a **warm and fuzzy feeling** about the true craft of software testing; a conference that **motivates** you to be the very best tester you can be; a conference where you are surrounded by **peers** in an **open welcoming forum**, where every opinion is valid and **every opinion counts**; a conference where you can **speak to experts**, learn and engage, upskill, gain **new perspectives**, take home **new ideas** and leave with feelings of **excitement** and a collection of **new friends** – **then this is the conference for you!**



UKSTAR is delighted to be working in partnership with the BCS SIGiST.  And we are offering **SIGiST members a 10% discount off UKSTAR tickets!**

Simply use the code **bscss-091** when booking!

**We will also be giving away a free two day ticket for UKSTAR at the next SIGiST Winter Conference on Wednesday 7th December 2016.  Don't miss out – we hope to see you there!**

For further details on UKSTAR see our website [ukstar.eurostarsoftwaretesting.com](http://ukstar.eurostarsoftwaretesting.com).  For queries please email [info@ukstarconference.co.uk](mailto:info@ukstarconference.co.uk)

# Crowdsourced Testing

## Elizabeth Mathew,
## UST Global

## Abstract

Digital transformation has resulted in redefining how quality assurance is performed in the Industry today. The abandonment rates of digital consumers have increased significantly in the last couple of years due to poor customer experience and failure to understand the end customer needs. Customers have become less tolerant to poor quality and also expect a channel agnostic experience in their digital journey. It is important to understand consumer sentiment proactively and accurately to ensure that we provide a world class experience.

A common challenge in today's industry is to cope with the dynamic nature of rapidly changing technology and device landscape and this has a direct impact on test coverage and quality. Crowdsourced testing will help you to reduce the capital investment in procuring mobile devices where we would leverage our testing and domain experts to carry out testing of mobile applications. The approach enables you to reduce the time to market as defects are identified faster and also helps you achieve wider device and test coverage for testing. The whitepaper details about UST Global's point of view on how crowdsourced testing can be leveraged to achieve speed to market and improve the overall quality of applications.

## What is Crowdsourcing?



> "Taking a service traditionally performed by a person or team and sourcing it to a large online group of people as an open project." Jeff Howe Author of "Why the Power of the Crowd Is Driving the Future of Business"

Crowdsourcing is defined as the "practice of obtaining required services, ideas, or content by soliciting contributions from a large group of people and especially from the online community rather than from traditional employees or suppliers. The two words "Crowd" and "Outsourcing" were combined to generate the term "Crowdsourcing". The approach helps you to receive an

improved quality result by in a faster way as a huge crowd with variety of skills, perceptions and ideas.

Jeff Howe and Mark Robinson, editors at Wired Magazine, coined the term "crowdsourcing" in 2005 during their conversations about "How businesses were using the Internet to outsource work to individuals" and they came to a conclusion that what was happening was like "outsourcing to the crowd," which quickly led to the portmanteau "crowdsourcing".

A great example of crowdsourcing is the Internet site Wikipedia. Instead of investing lots of money to create an encyclopedia, the founders of Wikipedia created a platform where anyone could contribute and edit the content. Wikipedia is open to everyone and is a prime example of how to harvest through crowdsourcing and the degree of success possible.

## Crowdsourced Testing

"Crowdsourced Testing", is emerging testing methodology which exploits the benefits, effectiveness, and efficiency of crowdsourcing. It's an approach of leveraging a large crowd from the organization/online community to perform in real world testing of mobile applications/websites on need basis to improve quality, achieve speed to market and reduce Cost".

Crowdsourced testing is not replacement for the traditional testing but it is an alternative to accelerate defect identification and also provide wider device coverage for testing. Crowdsource testing puts the software to test under real world conditions by users' in order to get a real perception, feedback of the application and to identify defects quickly.

> Gartner's view on Crowdsourced Testing
>
> "By 2018, crowdsourcing will constitute 20% of all enterprise application development sourcing initiatives."
>
> "Estimates $50 million to $75 million spend on crowd testing in 2015"

Crowdsourced Testing is can be used for functional testing of mobile and responsive website. Besides functional testing, crowdsourced testing can be extended for usability, performance, localization, and compatibility testing. Crowdsourced testing can be performed using two types of Crowd: Public Crowd and Private Crowd. In case of public crowd, the testing will be outsourced to the people outside the organization i.e. the online community. In case of private crowd, testing is performed by the employees who are part of the organization.

Some of the service providers that offer crowdsourced testing services are Applause, 99tests, Bugcrowd and Bugfinder.

## Approach for Internal Crowdsourced Testing

First step involved in Crowdsourced Testing, is to identify a crowd curator. The crowd curator is responsible for the overall delivery of the service and acts as the liaison between service requestor and participants. The crowd curator sends out invitations across the organization in order to identify associates who interested to participate in crowdsourced testing. Basic

information such as years of experience, domain knowledge, location, language skills and device details are collected as part of registration. Whenever there is an application that needs to be crowd tested, the crowd curator collects information such as type of application, type of testing, project documentation, OS support, Browsers support, device support etc. from the requestor. The crowd curator shortlists the associates for the crowdsourced testing cycle by matching the application details with the registered users database and sends out invitations to participate in the testing cycle.

A detailed walkthrough of the application is provided to the participants. During the course of testing cycle, participants tests the applications and logs the defects in the defect tracking system. At the end of test cycle, the crowd curator reviews the defects and prepares a Test Summary Report. The test summary report is then shared with the requestor and the requestor is billed based on a pay per defect model. Participants are awarded points based on the severity of the defects or provides with gifts based on number of defects logged or the best defect.
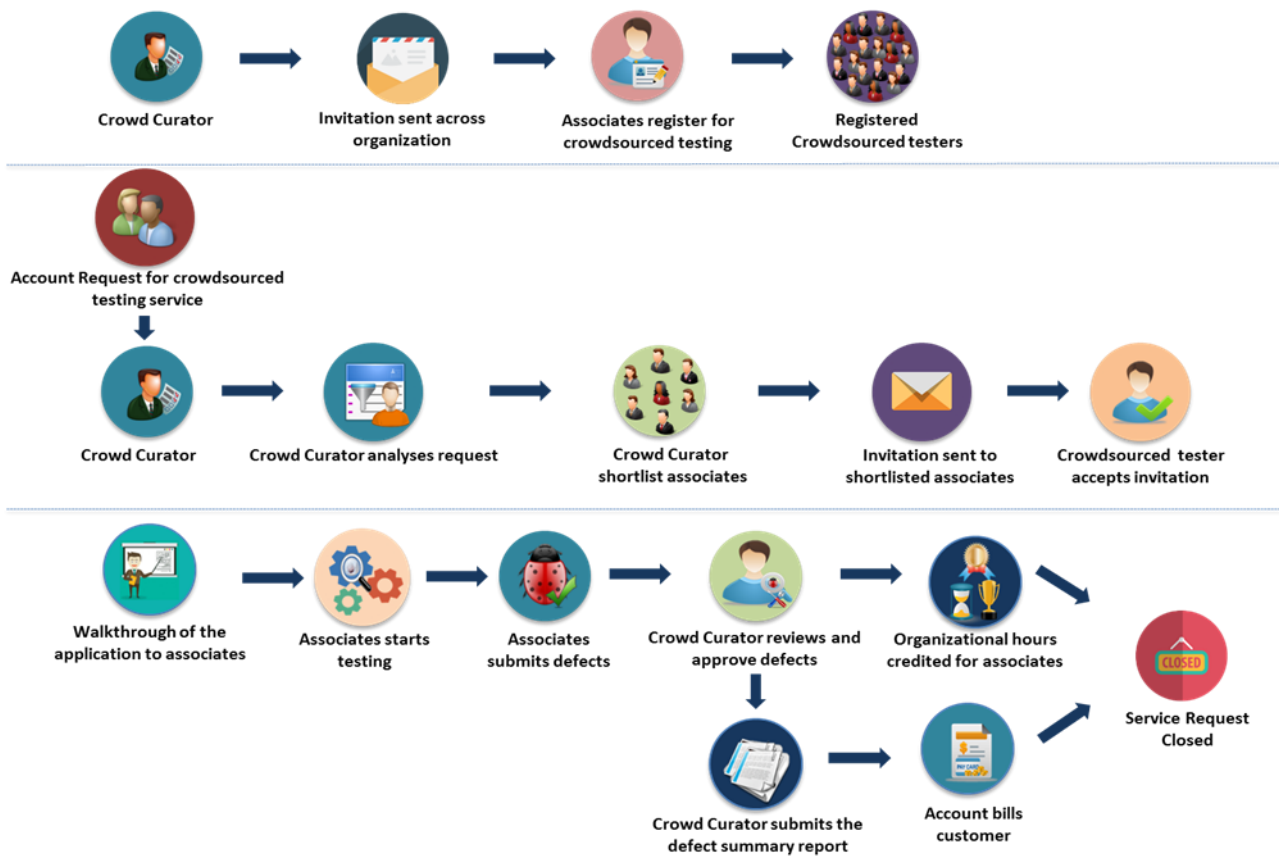


Figure 1: Internal Crowdsourced Testing Approach

## Crowdsourced Testing Maturity Levels

The most suited approach for implementing internal crowdsourced testing is by adopting a phased approach.  There are there levels of maturity that can be defined and each of the levels can be achieved in a time frame of 4-5 months. The Level 1 maturity level is basically *ad hoc* where no formal processes are followed. Level 2 consists of standardizing processes whereas Level 3 focuses on more on tools, rewards and commercial models. The details of the three levels are provided below for reference.
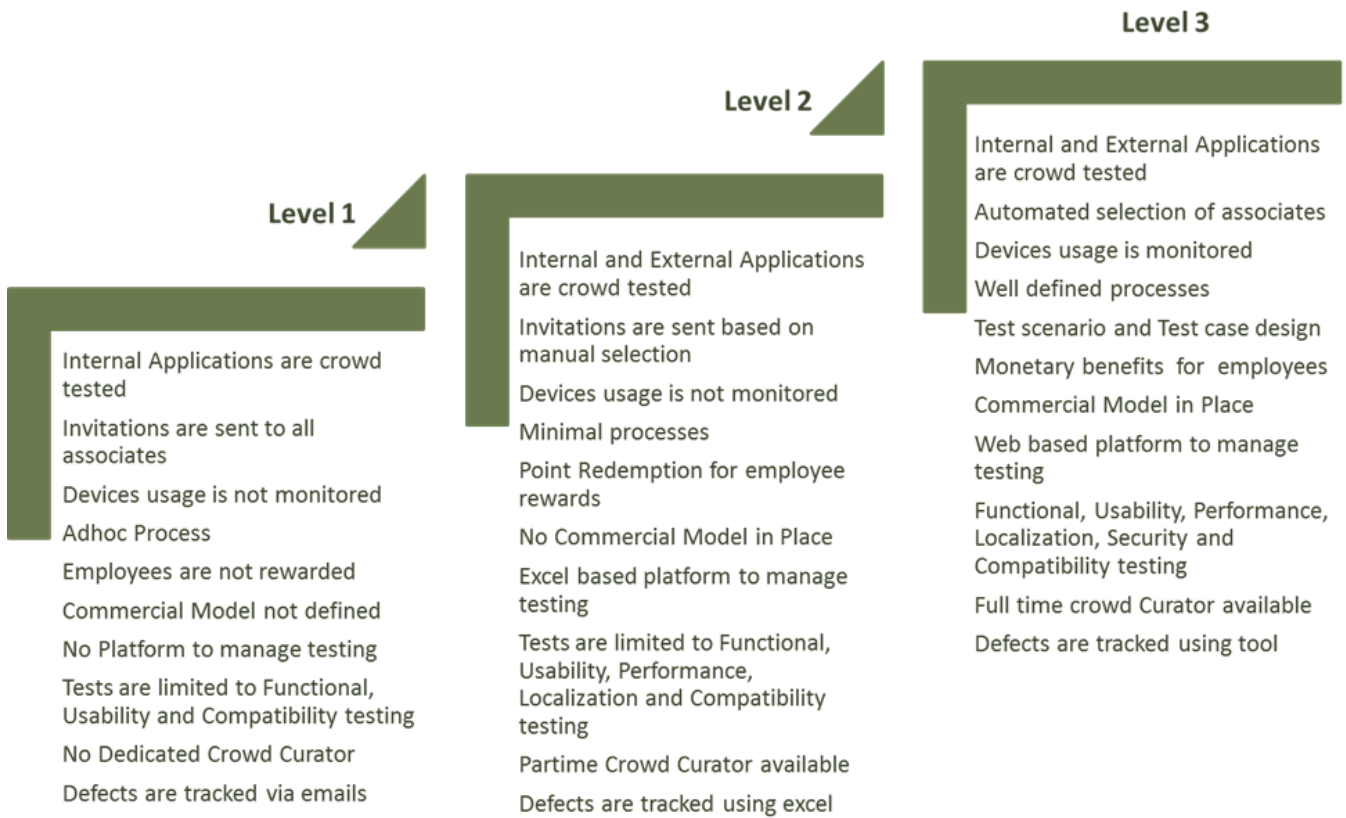
**Level 1**

Internal Applications are crowd tested

Invitations are sent to all associates

Devices usage is not monitored

Adhoc Process

Employees are not rewarded

Commercial Model not defined

No Platform to manage testing

Tests are limited to Functional, Usability and Compatibility testing

No Dedicated Crowd Curator

Defects are tracked via emails

**Level 2**

Internal and External Applications are crowd tested

Invitations are sent based on manual selection

Devices usage is not monitored

Minimal processes

Point Redemption for employee rewards

No Commercial Model in Place

Excel based platform to manage testing

Tests are limited to Functional, Usability, Performance, Localization and Compatibility testing

Partime Crowd Curator available

Defects are tracked using excel

**Level 3**

Internal and External Applications are crowd tested

Automated selection of associates

Devices usage is monitored

Well defined processes

Test scenario and Test case design

Monetary benefits for employees

Commercial Model in Place

Web based platform to manage testing

Functional, Usability, Performance, Localization, Security and Compatibility testing

Full time crowd Curator available

Defects are tracked using tool

Figure 2: Internal Crowdsourced Testing Maturity Levels
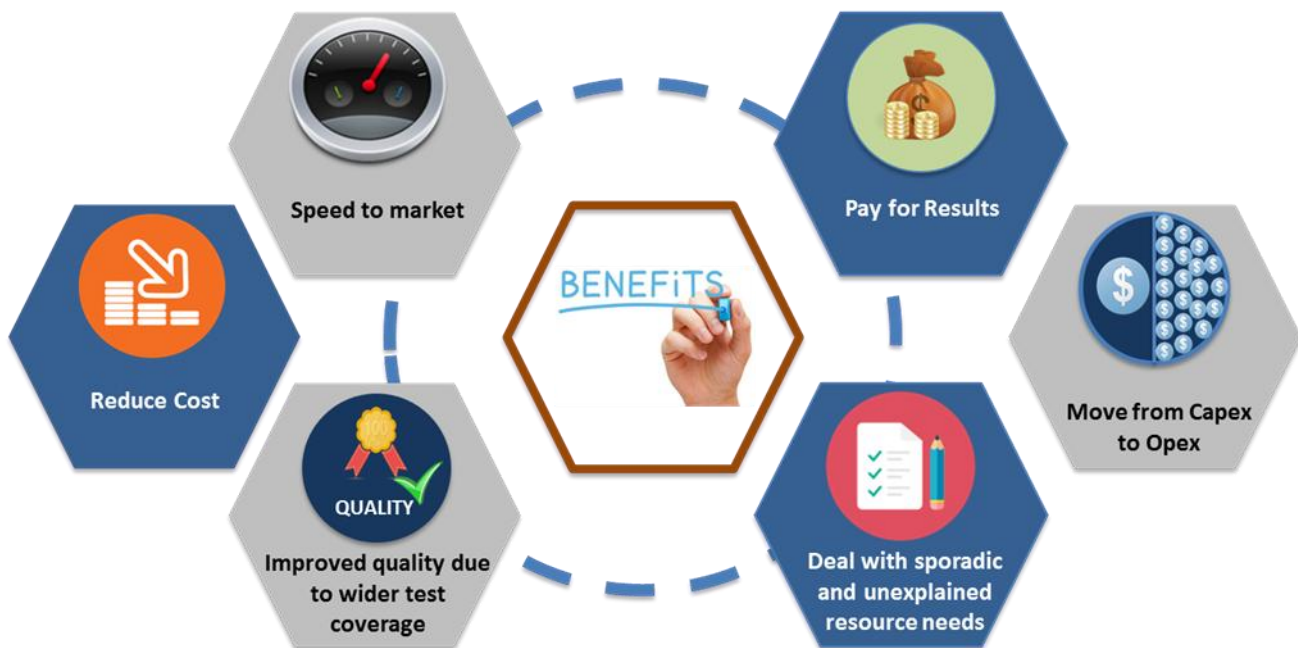
## Benefits of Crowdsourced Testing



Figure 3: Internal Crowdsourced Testing Benefits

## Conclusion

As we have discussed, Crowdsourced testing is an emerging methodology where real world testing of mobile applications and websites are performed on need basis to improve quality, achieve speed to market and to reduce cost. Crowdsourced testing dynamically distribute workloads based on expertise level of the participants with the ability to aggregate results and derive key insights in an automated fashion. Crowdsourced testing will play a major role in meeting up with digital consumers' needs around speed and quality.



**Elizabeth Mathew** works as a Test Engineer in the Enterprise Assurance practice of UST Global and has more than three years of testing industry experience. She specializes in automated test design and has extensive experience in leading crowdsourced testing cycles. She has deep domain expertise in E-Commerce and Health Insurance domains.



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## Write an article

We are always on the lookout for new content, so if you have a testing story you would like to share, a test technique you would like to evangelise or testing research you would like to publish, then The Tester is the place to do it. Simply email the Editor on phill.isles@bcs.org

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# BCS SIGiST 2016 and 2017, your invitation

## Isabel Evans, SIGiST Programme Secretary

### Winter: Wednesday 7th December 2016

Booking now open: http://www.bcs.org/category/9264

See above for the programme

At the December conference our speakers will challenge you and we ask you to challenge yourselves.

Keynotes: Mieke Gevers discusses the challenges of performance testing and Antony Marcano asks: 2017 - what technical challenges do we face?

Other full length presentations:

- Steve Watson discusses Challenges for TMs in changing roles
- Bob Stickland IT Programme Leader T3/T5 Heathrow presents Heathrow Terminal X - the testing challenges

Dr Stuart Reid hosts a Test Design Challenge Workshop.

We have four short talks on a variety of topics from our new speakers.

Your chance to raise a debate: we'll hold some slots for on-the-day Soap box sessions - book to speak on the day - 5 mins each!

The SIGiST committee reserves the right to amend the programme if circumstances deem it necessary. Workshops will have limited places.

# BCS SIGiST 2017

We have confirmed London dates for 2017: 14<sup>th</sup> March, 14<sup>th</sup> June, 14<sup>th</sup> September and 1<sup>st</sup> December. So put them in your diary and request the budget to come!

We also have a confirmed date of 9<sup>th</sup> February 2017, for the Leeds "Northern Lights" Conference, in association with the BCS West Yorkshire Branch.  See page 17 of this edition of The Tester for further details.  Other dates for regional conferences are also being organised.

We are planning the programme, so if there is a topic or speaker you'd like covered please let us know via the SIGiST website. We are particularly interested in future challenges for testing, 4th Industrial Revolution and coming trends, but we also want some sessions on the here and now. Got a story you'd like to tell? Got a topic you'd like covered? Tell us!

## Do you want to speak at events?

We now have a full programme for 2016, and we are planning 2017.  If you want to speak, please apply at http://www.bcs.org/category/10880, or let us know ideas for topics and speakers you'd like to see at the SIGiST.

## Do you want to sponsor events?

If your company works in these areas providing tools, software or consultancy / training you might want to sponsor an event, if so please contact Hiedi Homan via
http://www.bcs.org/upload/pdf/sigist-vendor-information-sheet.pdf

*The SIGiST committee reserves the right to amend the programmes if circumstances deem it necessary. Workshops in will have limited places.*

# Open-Source Test Automation Tools and You

Eran Kinsbruner,
Perfecto Mobile

## Abstract

There's a shift to open-source mobile test automation tools happening today among developers and QA. And it's not just happening in mobile testing. Many mature technology sectors are adopting lightweight, vendor-transparent tools to fulfill the need for speed and integration.

As with many free and open-source software markets however, a plethora of tools complicates the selection process. How do you know what to spend time learning, integrating and deploying in your own environment?

This post aims to help you choose which open-source test automation framework to use based on a number of critical considerations.

## Criteria for Selecting an OSS Test Automation Framework

The rationale and advantages behind your choice of open-source test automation tools can be related to a few key benchmarks:

1. **Ease of script development and execution** (supports agile processes and short iterations)
2. **Cross team collaboration capabilities** (Both QA and Dev can easily use the same tools)
3. **Match app platform with test development language** (ObjectiveC/Swift for iOS, Java for Android)
4. **No platform capabilities gap around testing** (support for the latest OS features)
5. **Support for real devices as well as emulators and simulators**
6. **Fully integrated tools within IDEs**

Additionally, there are considerations that differ from project to project:

**What Are the Application Use Cases? What Level of Complexity Needs to Be Tested?**

- Heavy UI elements?
- Environment dependencies (Networks, GPS, Camera)?
- What OS versions and API levels should be supported?

**Does the App Support Multiple Platforms (iOS, Android, Web)?**

Based on these considerations, you are far more likely to see long-term success with your automated testing efforts than if you simply dive in to a given framework without understanding the implications.
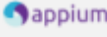
## SO what are the most popular OSS test automation frameworks?

When looking at today's open-source mobile test automation landscape, there are five highly-adopted test frameworks:

1. **Selenium** – The leading open-source test framework for web app test automation
2. **Appium** – Open-source test automation framework for mobile native, web, and hybrid apps
3. **Calabash** – Behavior-driven development (BDD) test framework based on Ruby development language
4. **Espresso** – Google open-source test automation framework within Android Studio
5. **XCUITest** – Apple's open-source test automation framework within XCode IDE

Each of these frameworks are being sponsored by a different community and have unique benefits to their target platforms and respective audiences. Though general-purpose frameworks cover a broad range of devices, they often lack late-breaking hardware support; conversely, frameworks that are device-specific often lack support for different scripting languages and approaches. It is therefore important to identify what is important to your team and project as part of the selection process, and avoid just selecting a framework based on technical requirements.

In the table below, we list the top test automation tools with their core capabilities and limitations:

| Capabilities | | Selenium | Appium | Espresso | XCTest UI | Calabash |
|---|---|---|---|---|---|---|
| Application Type Support | Mobile Web | Yes | Yes | No | No | No |
| | Native | No | Yes | Yes | Yes | Yes |
| | Hybrid | No | Yes | Yes | Yes | Yes |
| | Desktop Web | Yes | No | No | No | No |
| Supported Mobile Platforms | Android | Yes | Yes | Yes | No | Yes |
| | iOS | Yes | Yes | No | Yes | Yes |
| Supported Context | App Context | N/A | Yes | Yes | Yes | Yes |
| | Device Context | N/A | Yes | No | Yes | No |
| Scripting Development Language | Java | Yes | Yes | Yes | No | No |
| | Python | Yes | Yes | No | No | No |
| | C# | Yes | Yes | No | No | Yes |
| | Ruby | Yes | Yes | No | No | Yes |
| | Java Script | Yes | Yes | No | No | No |
| | Perl | Yes | Yes | No | No | No |
| | ObjectiveC/Swift | Yes | Yes | No | Yes | Yes |
| Supported Visual Object | | N/A | N/A | Yes (with extension) | No | No | No |
| Integrated with IDEs | Eclipse | Yes | Yes | Yes | No | Yes |
| | Android Studio | Yes | Yes | Yes | No | Yes |
| | Xcode | Yes | Yes | No | Yes | Yes |
| | Visual Studio | Yes | Yes | No | No | Yes |
| | IntelliJ IDEA | Yes | Yes | Yes | No | Yes |
| Supported by Mobile OS Vendors (no gaps) | | N/A | No | No | Yes (Google) | Yes (Apple) | No |
| Real devices | | N/A | Yes | Yes | Yes | Yes | Yes |
| Simulators/Emulators | | N/A | Yes | Yes | Yes | Yes | Yes |
| Automatic sync between test actions and App UI | | N/A | No | No | Yes | No | No |
| Test Recorder | | N/A | No | No | Yes (Version 2.2+) | Yes | No |
| Community Support | | N/A | Active | Very Active | Google | Apple | Average |
| GitHub Rankings | | N/A | 787 Stars | 2444 Stars | NA | NA (*KIF 3017 Stars) | 1930 Stars |

## Why Choose One Framework Over Another?

You may already have portions of test automation frameworks and tooling integrated into your software delivery process. These decisions may not always have been made by a single person or team, but rather a collection of experiences and motivations over time. A few of these motivations are:

- Teams trying to get fast quality feedback per each of their app builds and code commits
- Teams testing UI and functionality of their app
- Teams using behaviour-driven testing tools to match their agile processes
- Performing cross-platform testing of mobile and web

- Complementing unit testing

The table above shows that not every tool or test framework can provide full coverage of your requirements, and may even come with a risk of limiting the quality of the mobile or web app under test do to their shortcomings. We have summarized each approach to help you decide which makes the most sense for you.

## Appium

Appium is best suited to QA teams trying to test the functionality of native, mobile web and mobile hybrid apps across iOS and Android. This tool is less suitable for developers who wish to develop and perform unit testing since it uses a different scripting language than the app itself, (e.g. ObjectiveC). The generated Appium report is a bit limited from a debugging and fast feedback loop perspective, and does not include videos, network logs and key vitals information.

## Selenium

The Selenium framework is the best choice for web test automation teams testing for RWD (responsive web design), or stand-alone web sites. It's less suitable for developing unit testing, which makes this framework less appealing for developers. Core Selenium test reports are not highly informative and lack unique mobile related insights.

## Calabash

Calabash is designed for organizations that work in BDD (behavior-driven development) workflows. The tool offers an easy path to develop the features in parallel with the tests for these features in an easy user-flow based language. Calabash is appealing for both dev and QA practitioners. The tool provides solid insights and reports to Dev and QA teams.

## Espresso and XCTestUI

These two tools are very similar in that they are both designed for a specific target user. Espresso is for Android and XCTestUI is for iOS. Both tools are fully integrated into development IDEs such as Android Studio/Xcode, and offer very easy to develop techniques, including test recorders. These tools are fully maintained by Google and Apple, which assures that they always support the latest OS features (i.e. iOS Force Touch) so developers can stay ahead of the market and test accordingly. These tools support both unit testing types and functional UI testing. Both tools are app context only, which limits their abilities to test for user condition scenarios.

Like what you read? [Follow this link](#) for more interesting posts on test automation strategy.

**Eran Kinsbruner** is the Mobile Evangelist at Perfecto Mobile, one of the leading mobile cloud and automation companies. Formerly CTO for mobile testing and Texas Instruments project manager at Matrix, Eran has been in testing since 1999 with experience that includes managing teams at Qulicke & Soffa, Sun Microsystems, General Electric and NeuStar. The co-inventor of a test exclusion automated mechanism for mobile J2ME testing at Sun Microsystems, Eran has vast experience in the mobile testing world. You can find Eran on Facebook, Twitter @ek121268, LinkedIn, and his professional mobile testing blog at ek121268.wordpress.com.

# Event Listings

If you would like your event listed here, please contact the Editor phill.isles@bcs.org

## 2016

## December

**Agile Testing Days**
5 – 8 December 2016
Potsdam / Berlin, Germany
http://www.agiletestingdays.com/

**SIGiST**
7 December 2016
London, UK
http://www.bcs.org/category/9264

## 2017

## February

**SIGiST and BCS West Yorkshire Branch "Northern Lights"**
19 February 2017
Leeds, UK
http://www.bcs.org/category/9264
http://www.bcs.org/category/14985

**UKSTAR**
27 – 28 February 2017
London, UK
https://ukstar.eurostarsoftwaretesting.com/

## March

**SIGiST**
14 March 2017
London, UK
http://www.bcs.org/category/9264

## May

**STAREAST**
7 - 12 May 2017
Orlando, US
https://stareast.techwell.com/

## June

**SIGiST**
14 June 2017
London, UK
http://www.bcs.org/category/9264

## September

**SIGiST**
14 September 2017
London, UK
http://www.bcs.org/category/9264

## November

**EuroSTAR**
6 – 9 November 2017
Copenhagen, Denmark
https://conference.eurostarsoftwaretesting.com/

## December

**SIGiST**
1 December 2017
London, UK
http://www.bcs.org/category/9264

## Did you get your Personal Development Plan email with suggested potential CPD activities?

The BCS Personal Development Plan (PDP) uptake is going well, with thousands of registered users already actively recording their CPD Development Goals, Activities and preferences. It's not just about recording details though, as there is a Resources section that shows live feeds of potential CPD activities, and a tailored email is sent every 2 months with details of the latest videos, articles, blogs, books and research in your specified field of interest. If you haven't registered yet, you can see the content from the latest PDP bulletin for topics relating to solution development and implementation here http://www.bcs.org/content/ConWebDoc/50854 or by going to the CPD Portal at:  http://www.bcs.org/pdp/.

The BCS Personal Development Plan is free to use; BCS members can use their Member Secure Area login and password to access it at https://pdp.bcs.org/, and non-members can use most of the facilities (using the same link) and registering to create their own user name and password. You can use it on a PC / laptop or compatible tablet PC or smartphone.