March 2017

Specialist Group in Software Testing

THE TESTER

SIGiST Spring Conference
Tuesday 14th March 2017

60

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From the Editor

Welcome to the ***SIGiST*** and ***The Tester***. You will more than likely be reading this after our Leeds "***Northern Lights***" conference, which was a sold-out event! Missed it? Look out for our Manchester conference in October. The SIGiST Spring conference is almost upon us, and once again we have a plenary workshop, between two great keynote presentations. Come along for a highly interactive workshop from international-renowned speaker Fiona Charles.

The SIGiST committee would like to thank the sponsors for our Leeds event Bugfinders and NHS Digital, and for our London event Test Partners, Ten10 and Planit Testing.

Ever thought about speaking at a Testing Conference? Well, now you can. We are again running our Mentoring for New and Improving Speakers, after its success in 2016. Closing date for applications is 31st March.

In the rest of ***The Tester***, read some interesting articles covering topics from testing less, conflict and acceptance testing.

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/2363/

Join our Linked-In Group:

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

Follow us @SIGiST

Conference Agenda

BCS SIGiST – Spring 2017 Conference – Tuesday 14th March 2017
BCS 1st Floor, Davidson Building, 5 Southampton Street, London. WC2E 7HA.

Thinking about testing: how do we do what we do?

Time	Session
09:25	***Welcome – Stuart Reid, Chair, SIGiST***
09:30	Keynote ***Help! I'm only human! Understanding and supporting the human tester*** Dr Mark Micallef and Dr Chris Porter, University of Malta.
10:30	*Networking Session – Stephen Hill, Social Media Secretary, SIGiST*
10:45	Coffee, Tea & Refreshments
Morning	**Workshop**
11:15	***Plenary workshop*** **Test Heuristics** Fiona Charles Quality Intelligence, Canada
13:00	Lunch in networking area **Videos or Vendor presentations in small workshop room** Test Partners, Ten10
Afternoon	**Workshop continues**
14:00	***Plenary workshop*** **Test Heuristics** Fiona Charles Quality Intelligence, Canada
15:30	Coffee, Tea & Refreshments
16:00	*Keynote* ***Thinking about Test Management….*** Geoff Thompson, Planit Testing
17:00	***Close - Stuart Reid, Chair, SIGiST***

The SIGiST committee reserves the right to amend the programme if circumstances deem it necessary.

Conference Sponsors

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.

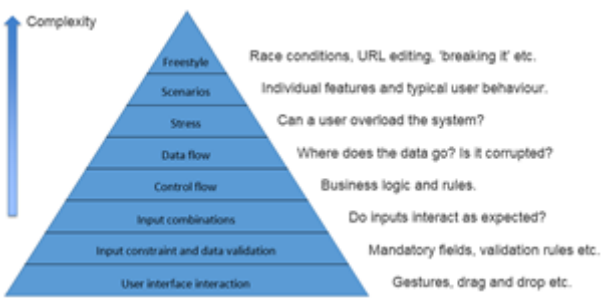
Test Lab

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.

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 Tuesday 14th March 2017

Conference Sponsors

http://www.ten10.com/

Conference Sponsors

https://www.planittesting.com/uk

SIGiST Conference Venue

The March 2017 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

Mark Micallef and Chris Porter, University of Malta

Help! I'm only human! Understanding and supporting the human tester

Software testing is an intensely human activity that aims to improve the user experience for the end users. As systems become increasingly complex, the task of uncovering faults before deployment becomes much harder, leading to a phenomenon amongst software testers known as information anxiety - stress caused by the inability to access, understand, or make use of information necessary for employees to do their job. Software testers are particularly susceptible to this phenomenon because they operate in a highly voluminous context of continuously changing information. The typical software tester needs to be knowledgeable about software testing techniques, the domain of the system which they are testing, current features, stakeholder priorities, outstanding bugs, timelines, processes and regulations, to name a few. This can quickly lead to the tester feeling lost and/or burnt out, leading to a direct effect on the quality of the end product.

In this talk, we will take the audience on a journey through a number of research projects in which we utilise human computer interaction techniques and technologies to form a deeper understanding of the human tester and subsequently use that information to help support them in their day to day jobs. We will discuss ways to understand what strategies are being used by exploratory testers, whether they are in a state of anxiety, whether they think a system is behaving as expected, what information they need and how we can present it to them just in time and in innovative ways so as to minimize cognitive workload and improve overall performance.

***Chris** 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.*

***Mark** 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.*

In March 2016, Mark, Chris and their team came to the BCS SIGiST and the SIGiST attendees were some of the research subjects for this work.
Come to the March 2017 SIGiST to hear some of the results gathered in 2016.

Closing Keynote

Geoff Thompson, Planit Testing

Thinking about Test Management….

Thinking about test management, is not easy and in most cases it isn't something that comes naturally. But, in my experience, every Test Manager has the opportunity to turn each project they work on into a work of quality. The skill of test management is not in creating Gannt charts and producing regular reports, it is in how you work with your team and within the project team as a whole.

The success of a Test Manager is mostly down to thinking about and applying the softer skills needed to negotiate, motivate and influence the test team and all stakeholders.

This presentation will look at how you recognize skills in your team and what roles they play, as well as looking at how the use of negotiation, motivation and influencing skills form a significant part of a test manager's thinking skills and a project's success.

We will review the role of a test manager in projects today where they could be working across many different development approaches, and look at how understanding your team's capabilities is key to success. In the world of Agile and DevOps it has never been more important to ensure your team work together, possibly across continents, and are motivated to deliver their best for the project.

***Geoff** is the UK Director of Testing Services for Planit Testing, part of the global Planit Testing group. He has a real passion for software testing, test management and process improvement.*

He is a founder member of the International Software Testing Qualification Board (ISTQB), the TMMi Foundation, and the UK Testing Board and is currently the Secretary of the ISTQB and Chairman of the UK Testing Board.

He co-authored the BCS book Software Testing - An ISEB/ISTQB foundation and is a recognized international speaker, keynoting in many conferences, and was the chair of EuroSTAR 2011.

Geoff is Vice Chairman of the SIGiST and its Treasurer.

In 2008 Geoff was awarded the European Testing Excellence Award, and in 2015 he was awarded the Software Testing European Lifetime Achievement award.

Plenary Workshop!

Fiona Charles

Test Heuristics

Variously defined as “fallible methods for solving problems” (Bach & Bolton) or “rules of thumb”, heuristics are essential tools for thinking test practitioners. When you construct a test around a model like “follow the money”, or adopt a leadership pattern where you challenge your team members with stretch goals, you are working with a heuristic. In each case, the model may be applicable and useful in some contexts, and irrelevant or even detrimental in others.

One of the keys to using heuristics successfully is to do so consciously. If you aren’t aware that you are operating with a heuristic model, it can become an unchallenged assumption. But if you consciously use a model as a heuristic, then you are in a better position to see its weaknesses and potential failure points in a given situation.

In this workshop, we will explore the use of heuristics in problem solving and software testing. Working in groups, participants will have opportunities to design heuristics to solve particular problems, apply them to problem solutions, then critique their models and share their conclusions with other groups.

The session will be highly interactive, consisting principally of problem-solving exercises and debriefs. Conscious use of heuristics requires both creativity and critical thinking skills. Come prepared to practice and extend yours!

Fiona Charles *teaches organizations to manage their software testing risk, and IT practitioners project skills “beyond process”—hands-on practical skills essential to thrive and excel on any kind of software project. An expert test consultant and manager, she has been immersed in the action through 30+ years of challenging projects across the business spectrum on both sides of the Atlantic. Throughout her career, Fiona has advocated, designed, implemented and taught pragmatic and humane practices to deliver software worth having. Fiona publishes articles and blog posts, and she conducts experiential workshops at international conferences and in-house for clients. She is the co-founder (with Anne-Marie Charrett), of Speak Easy, a volunteer organization whose goal is to increase gender diversity and help new speakers find their voices at tech conferences. Contact Fiona via her website www.quality-intelligence.com,and follow her on twitter @FionaCCharles.*

BCS SIGiST Mentoring:
New and Improving Speakers 2017

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.

During 2017, we are offering up to 4 new or improving speakers the chance to speak at a conference. Two of the new speakers will take part in the September SIGiST, when the theme for the day is Growing your testing skills: Increasing our capability as testers. The other two take part in the December SIGiST when the theme is "Take a Risk". We want you to tell us a compelling story about testing: what it means to you, how you do it, something important you have learned, a war story about a project, or a skill / knowledge that we could learn from you.

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:
    - advise how to make an appealing abstract to submit
    - guide you in preparing your submission
    - explain the presenting technology
    - review and help you rehearse your presentation
    - introduce you when you speak at the BCS SIGiST conference in London
- present a 20 to 25 minute talk at the BCS SIGiST on 14th September 2017 or 1st December 2017

How do I apply? There is an application form on the BCS SIGiST website.

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.

When do I need to do this? NOW! The deadline is **31st March 2017**.

BCS SIGiST Mentoring

The mentors for 2017

Stuart Reid

http://www.stureid.info/

Rosie Sherry

http://www.softwaretestingclub.com/profile/rosiesherry

Steve Watson

https://uk.linkedin.com/in/sjwatsonuk

Gordon Thompson

https://uk.linkedin.com/in/gordonthompson

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. An announcement will be made at the **end of March** of who has been successful.

What happens then? If you are successful in your application, you will provide an improved abstract submission **by the end of July 2017**, and a presentation **in September or December 2017**. Your mentor will provide advice, review comments and discuss your ideas with you, but you are responsible for content and delivery. Some of you will also have a chance to take part in a short workshop from renowned speaker Antony Marcano before the SIGiST or a short workshop with the Evil Tester himself, Alan Richardson on the day of the SIGiST.

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? Thursday 14th September 2017 or Friday 1st December 2017, at the BCS Offices, Davidson Building 5 Southampton Street London WC2E 7HA.

"Increase your capabilities"

"Take a risk!"

My experiences of the BCS SIGiST Mentoring scheme

Andrew Shaw BSc MBCS

I have been developing a career in software testing, and enjoying gaining experiences in different types of software testing like Automated Testing, Manual Testing and Exploratory Testing. I also wanted to develop myself as a professional public speaker and saw the BCS SIGiST Mentoring Scheme, which started for the first-time last year, as a great opportunity to further develop myself in delivering professional presentations and learning from a world class mentor on how I can be a better public speaker.

I decided to focus on the challenges I had encountered undertaking Automated Testing and what I had learned from the experience that I could pass to other testers. After discovering I was accepted onto the scheme, I was both really delighted and nervous about delivering my talk at the SIGiST conference in December because I was going to be mentored by a world class speaker, Dot Graham. Dot has also mentored other software testing public speakers in the past who have become world class speakers, so I wanted to work really hard to ensure my presentation was the best that I could possibly deliver.

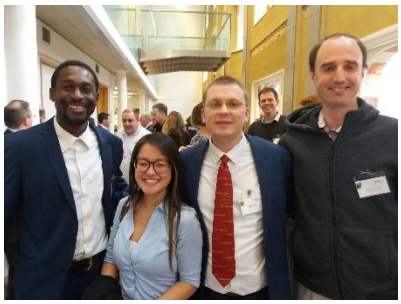
Whilst I was being mentored by Dot, I gained experience of identifying the key points that I wanted to deliver to a targeted audience, using good examples of the testing that I had undertaken to help my audience identify how specific software I was testing was being tested, and improving presentations which flowed consistently. I also rehearsed my presentation to Dot both face-to-face and via Skype and received constructive feedback on the areas of the presentation which were strong, and advice and encouragement on areas that could be developed.

Dot also recommended that I practiced my presentation to different audiences, to gain further experience. Therefore, I arranged with my connections, friends and family about delivering my presentation to different groups so I could improve my presentation in preparation for the SIGiST Conference in December. Delivering my presentation to different networking groups, family and friends increased my confidence and from each rehearsal I delivered I gained some really constructive feedback which helped me improve.

Whilst I was being mentored, Dot gave me a book that she co-authored, which gave real life examples of automation tests undertaken in different companies, and an insight into how the SIGiST conference was structured, to help further prepare me when I delivered my presentation. From her guidance I also gained further insights into how to develop automated tests for software and web based systems, as I was interested in developing experience in this area of software testing.

During the SIGiST Conference, delivering my presentation about the challenges I faced undertaking automated testing was a privilege and such a great experience. I also enjoyed listening to the presentations of the other mentees who were on the scheme and learning from each of their presentations how I could improve myself as a software tester.

During and after the presentation, I received praise and encouraging feedback from the audience who listened to my presentation, and was encouraged to deliver further presentations at future conferences, which was really touching. My presentation was also videoed on the day, so I could show it to my family and friends, who were proud of me.



The SIGiST mentoring scheme was fantastic and a great way for software testing professionals who wish to develop experience of public speaking, because the mentors on the scheme are inspiring and pass on a wealth of experience to help their mentees to further develop as speakers. Being mentored by Dot was a fantastic experience which I really enjoyed, and I would happily do it all again. Her guidance, encouragement, and ideas on how I could develop as a public speaker, has helped me improve as a public speaker and I plan to deliver more presentations in the future to different conferences.

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.

Andy was in the first group of mentees on the SIGiST New and Improving Speakers mentoring programme 2016.

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

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.

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

Why testing less could improve your software

Martin Mudge,

Co-Founder, BugFinders

In a digital world that's fast-moving and constantly evolving, it's natural to think you should always be doing more. New Smartphones, tablets, browsers and operating systems are being brought to market all the time. This means you should be doing more and more testing to keep up, right?

Not exactly. It's true that you need to keep pace with the rapid, on-going growth in the mobile device market – if you don't, your customer experience will suffer. But that doesn't mean your team should be doing all this testing by yourselves. In fact, it's a better idea to do less testing in-house by sharing the workload with an external testing partner. Here are 4 reasons why:

Avoiding burn-out

You can only push yourself and your team so hard before something has to give. If you try to test on too many devices and spend too many evenings at the office, tester burn-out is inevitable. When this happens, the quality of your work dips, you miss more bugs, and poorer software gets released.

Partnering with an external software testing company lowers your team's workload. As a result, you can maintain a high level of quality internally, while getting out of the office by 6 o'clock.

Freeing up money for development

A growing mobile device market doesn't just keep you working for longer hours – it also drives up the cost of your test lab. Buying in every new Smartphone and tablet that gets released is an expensive practice. It can begin to look even more expensive to senior executives when testing on those new devices doesn't prevent bugs from escaping into the live environment.

Working with an external partner like a Crowdsourced Testing company allows you to scale down your test lab to 10 or 20 key devices. This can free up money for development, allowing for greater innovation and, ultimately, better software.

Spending more time on each device or browser

If you attempt to test your app or website on 20 different devices or browser versions in 5 days, you will rush through each one as fast as possible to get the work done. Just as with any other kind of work, rushing never makes for good quality testing. Critical bugs will be missed, and the whole point of doing the work will be undermined.

Offloading responsibility for some of your work onto a partner can allow you to spend more time testing on the devices and platforms that matter most to your users. For example, you could run test scripts on 10 key Smartphones and have a partner perform wide-ranging Exploratory Testing on many more.

Getting to market quicker

Trying to test your software on hundreds of devices can delay getting to market by weeks at a time. But by partnering with external testing providers – particularly Crowdsourced Testing companies, which can rapidly test on large numbers of devices – you can reduce your time to market to a matter of days.

Getting software to market quicker means more time for other releases and updates. Therefore, your development & testing can become more agile and your apps and websites more innovative.

Leeds Conference Sponsor

BUGFINDERS

BCS SIGiST 2017, your invitation

Isabel Evans, SIGiST Programme Secretary

As well as the February (Leeds) and March (London) SIGiST events we have organised, we have four other conferences planned for 2017:

June 14th, London:	**The 4th Industrial Revolution**
September 14th, London:	**Growing your testing skills: increasing our capabilities as testers**
October 18th, Manchester:	**Northern Lights**
December 1st, London:	**Take a risk!**

We are planning a mix of international and UK speakers for each of these events, and look forward to welcoming you.

Do you want to speak at events?

We still have some speaking slots available for the London and Northern Lights events in 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. Non-plenary workshops will have limited places.

An Overview of Conflict in Software Engineering Teams

John Karn

Software testing is a team based activity, how team members interact and cooperate with each other has a bearing on whether or not a project can be successfully completed. Several scholars have argued that the social factors of Software Engineering are just as, if not more important than, the technical side of things [1], [2], [3] [4]. This view was reinforced by De Marco and Lister in their magnum opus 'Peopleware' [5], in which they persuasively argued that it was not technology that made companies or projects succeed or fail – it was people.

Conflict is widely believed to be an impediment to successful team working. Conflict has been defined in the Cambridge dictionary as "An active disagreement between people with opposing views or principles" [6], and in the Oxford dictionary as "A serious disagreement or argument, typically a protracted one" [7]. Given these definitions it is not surprising that the common view of conflict is that it is detrimental and should be avoided and if conflict does take place it is seen as a management failure. In order to present a more nuanced view and to differentiate between destructive and positive conflict Jehn went on to identify three distinct forms: task, process and relationship [8].

Task conflict is not inherently problematic. It refers to an awareness of differences and viewpoints pertaining to specific team tasks. Task conflict is positively related to the quality of ideas / innovations, increases constructive debate and prevents group-think. However, too much task conflict can interfere with consensus and the implementation of ideas; excessive levels have been found to lead to emotional exhaustion. Moderate levels are seen to be beneficial, too much or too little can be damaging.

I have observed task conflicts in software engineering teams following both agile and traditional methodologies. In agile teams there was opposition to the pair programming practice of XP, disagreement with the overall methodology and the feeling that one should not be too dogmatic when it comes to adhering to methodological guidelines, and as XP stresses that tests be written before any code some argued that they would prefer to write code first as this kept in line with their previous experiences. In traditional teams task conflicts occurred over doubts expressed over the level of documentation, which programming language to use and what should the level of detail be in design documents.

Process conflict pertains to issues of duty and resource delegation. This relates to issues such as who should do what, how much work should one get and disputes over responsibilities and assignments. Low to moderate levels can be beneficial at the beginning and towards the end of the project; however this form of conflict can also be detrimental. High levels can have a dysfunctional effect on team performance and member satisfaction, and can lead to inconsistencies in task roles and time management issues. Another negative aspect of process conflict is that it can misdirect an issue with a project's process to appear as an issue with individual team member's abilities.

As was the case with task conflicts, I have also observed process conflicts in both agile and traditional teams. In agile teams there were process conflicts over who should arrange meetings and when, and issues with working practices. Some team members preferred to work at home, or through the night, and this did not fit with the agile ethos of co-location and face to face communication. In traditional teams the process conflicts observed revolved around who would produce project documentation and when, who would be responsible for arranging meetings with the client who had commissioned the software, and the responsibility for performing a peer review of project artefacts before they were formally submitted.

The final form relationship conflict is at the forefront of people's thinking when they imagine conflict to be a wholly negative phenomenon. Relationship conflict is destructive; it refers to the perception of interpersonal differences, and focuses more on personalities as opposed to actual issues. This form of conflict should be avoided at all costs as it brings no benefits and reduces team effectiveness.

There were no specific methodology related relationship conflicts. For both agile and traditional teams I have witnessed hair splitting pedantry and sarcasm leading to flashpoints, accusations of people not doing their bit, distrust of project clients, and accusations of lying.

As alluded to above. This piece aims to promote a more nuanced view of conflict by introducing different forms. The widely held belief that conflict is negative by default does not hold true for all instances. To summarize, it is not entirely correct to say that conflict should be avoided at all costs. Conflict can actually be beneficial depending on the form and frequency, and whether the level of conflict is appropriate to the complexity and uncertainty of the task.

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***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.

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For further details on UKSTAR see our website https://ukstar.eurostarsoftwaretesting.com/.

For queries please email info@ukstarconference.co.uk

Three Pillars of Acceptance

James Brodie

As a consultant I have been asked to work across a number of different industries and work within a number of different methodologies. One of the constants across all of these variables is the need for User Acceptance Testing (UAT). I have however found that working with multiple clients that the definition of UAT can vary greatly.

ISTQB defines UAT as:

"Acceptance testing carried out by future users in a (simulated) operational environment focusing on user requirements and needs."

My rather simplistic definition is:

"Ensuring that the system under test meets the needs of the user as required."

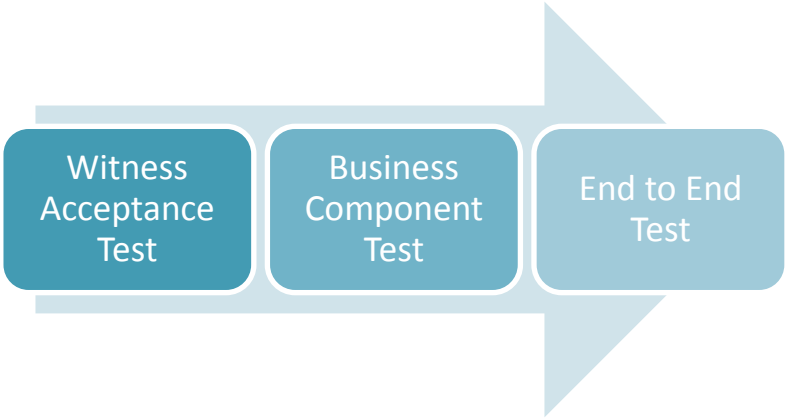
I found that especially in an Agile environment that UAT was being bolted on as part of the sprint and was concentrating on the business components rather than looking at the end to end business journeys. I felt that what is being called UAT wasn't actually encompassing what was being tested, it wasn't what the client needed and it was creating a bottleneck in the Agile process.

A common theme I also observed was that often the client would be working with development third parties and there would be a lack of confidence in the output being delivered. This would undermine the test process before it even began.

Working initially with one of my retail clients I recommended that we expand what was being called User Acceptant Test to Acceptance Test and then to call out the different elements that we are looking to accept.

Acceptance Test would then complement the existing system testing which was being performed by the suppliers and clients own test teams.

The three pillars of acceptance are shown in the diagram below.



Witness Acceptance Testing

- The third party supplier is responsible for the functional testing of their internal solution. The expectation is that the third party supplier will provide the client with a list of what has and hasn't been tested.
- The third party supplier will then provide the End to End Test Manager with artefacts that will demonstrate that the component has been tested.
- The artefacts will include an agreed subset of scripts as well documentation that can be 'witnessed'. This acts as the acceptance test into Business Component and End to End Testing.

Business Component Testing

- This is the acceptance testing of singular business functionality. (Typically this is what the client will describe as UAT)
- The output of this is to identify functionality that will be tested end to end as part of UAT.

User Acceptant Testing

- This is traditional end to end UAT.
- Confirming that the solution under test meets the needs of the user as required.

The purpose of this approach is that it is building business confidence for the system under test.

Witness Acceptance Test has the advantage that it can be used as part of the entry criteria into test, but it gives the business the tools to ask development (internal or external) to evidence the quality of the testing that has already been undertaken and it stops development from simply throwing code over the fence to make sure it hits a deadline rather than providing a quality deliverable.

Business Component Test mirrors System Test but from a business perspective. Within an Agile environment it is checking that the end of the sprint deliverable meets the need of the user.

By identifying the first two pillars for Acceptance Test it meant that User Acceptance Test would concentrate on the end to end solution and I also found that this helps to focus the mind of the client to specifically call out that they are looking at the complete picture.

As ever with an acceptance based approach, one of the key factors is ensuring that you have the right people in the test roles. A tester assigned to acceptance test must have a business background and I would recommend that where ever possible the business ring-fences their acceptance test team. This means the team gains experience as they work and it will help with future training as well.

James has been a test professional for eighteen years working for a wide range of companies and consultancies covering a broad range of sectors. As a Senior Test Engagement Lead James recently took the decision to form his own company Testbox Guru Ltd and now works as contract test senior professional.

Event Listings

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

2017

February

SIGiST and BCS West Yorkshire Branch "Northern Lights"
9 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

October

STARWEST
1 - 6 October 2017
Anaheim,, US
https://starwest.techwell.com/

SIGiST
"Northern Lights"
18 October 2017
Manchester, UK
http://www.bcs.org/category/9264

November

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

Agile Testing Days
13 – 17 November 2017
Potsdam / Berlin, Germany
http://www.agiletestingdays.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.

September 2017

Specialist Group in Software Testing

THE TESTER

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SIGiST Autumn Conference Thursday 14th September 2017

From the Editor

Welcome to the ***SIGiST*** and ***The Tester***.

The mission of the SIGiST is to support the Testing Community. All the committee members are volunteers and give their time freely to the SIGiST. We have noticed a change over recent years in the requirements of conference delegates, and will be changing the format of the conferences to meet these needs. Our northern conferences are popular, and will continue in their current format. The London conferences will change to possibly be more workshop-based and hands-on. This should allow all delegates to take something practical away with them, that can be used in their day-to-day roles. We are also looking to share events with other SIGs / Local Groups, to broaden exposure to the changing role of the stand-alone Tester.

For the September conference, come along for the usual day of excellent presentations and workshops, plus an evening session, shared with the BCS Advanced Programming Specialist Group.

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/2614/

Join our Linked-In Group:

LinkedIn/BCS SIGiST

Follow us @SIGiST

Conference Agenda

BCS SIGiST – Autumn 2017 Conference – Thursday 14th September 2017
BCS 1st Floor, Davidson Building, 5 Southampton Street, London. WC2E 7HA.

Growing your testing skills: increasing our capabilities as testers

Time	Session	
09:10	**The BCS SIGiST Annual General Meeting 2017**	
09:25	***Welcome – SIGiST Committtee***	
09:30	Keynote ***Next Generation Testers*** Dan Martland, Head of Technical Testing, Edge Testing Solutions	
10:30	***Networking Session*** *– Jen Wheeler, Networking Secretary, SIGiST*	
10:45	Coffee, Tea & Refreshments	
Morning	**Presentations**	**Workshop**
11:15	***200 Peas in a Pod: implementing Scrum at Scale*** Daryl Elfield, KPMG	***"Learning in public" - a workshop to help you improve your presentation skills*** Alan Richardson, Compendium
12:00	***The spin bowler and the agile tester*** Mike Harris, New Look Followed by discussion	
13:00	Lunch in networking area ***Vendor presentations 13:10 - 13:50*** Birds of feather discussion sessions	
Afternoon	**Presentations**	**Workshop**
14:00	***Is Quality All About Testing?*** Niranjalee Rajaratne, Third Bridge	***Focus on state transition testing – a way to model your testing world!*** Sue Atkins and Isabel Evans
14:45	***NSMS Short Talks*** ***Mobile automation: less is more!*** Kieran Thandi ***Cyber crisis - what testers need to know*** Emilija Strelcenia	
15:30	Coffee, Tea & Refreshments	
16:00	*Keynote* ***A personal journey of Testing Enlightenment*** Sue Atkins, Sopra-Steria	
17:00	***Close of the day meeting – SIGiST Committee***	
	Joint Evening Event with the BCS Advanced Programming Group ***Focus on automated testing***	
18:00	Registration and Networking	
18:30	***Challenges of Automated Testing: Structured Language Approach for Capturing of User Interaction*** Paul Chorley, Autotestpro	
19:30	Q&A	
19:30	Discussion & Networking	
19:30	***Close of the evening meeting - Algirdas Pakštas, APSG***	

The APSG and SIGiST committees reserve 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 14th September 2017. 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 2016 AGM (and matters arising)
- Reports
  - Chair
  - Treasurer
  - Standards Committee
  - Programme Secretary
- Committee elections
  - Chair
  - Vice-Chair
  - Programme Secretary
- 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 25th August 2017.

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).

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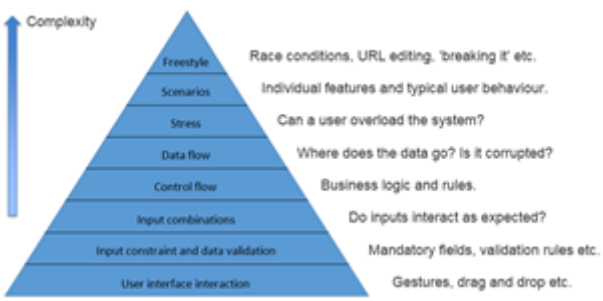

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- Final (WCAG) testing
- User testing with disabled participants
- Automated testing

BS8878 Accessibility Governance

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

Accessibility Training

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- Accessibility Training for Project Managers

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Thursday 14th September 2017

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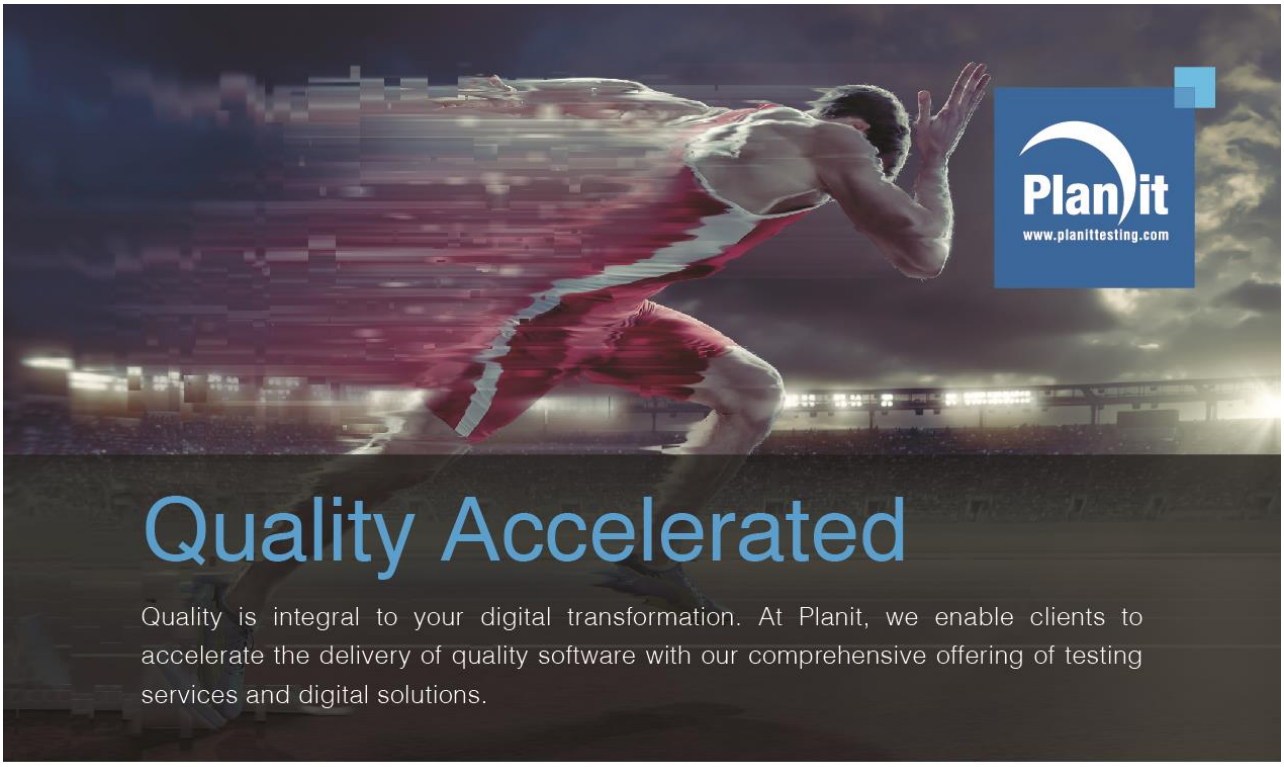

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SIGiST Conference Venue

The September 2017 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

Dan Martland, Head of Technical Testing, Edge Testing Solutions

Next Generation Testers

In the early days of professional testing, structure and objectivity were seen as paramount – the best testers did what they were asked, how they were asked and never deviated from that. In the world of modern, high speed development we need a more dynamic approach. Are the kinds of people we have been recruiting historically still the best fit for our needs? What aptitudes and personal qualities will be needed to succeed in the next generation of testing?

***Dan** is the Head of Technical Testing at Edge Testing Solutions. He has worked on many complex projects in his 20 years of test consultancy and is passionate about testing as a career. Having line-managed matrix teams of up to 80 consultants, Dan believes strongly in career development and how every day is a learning opportunity.*

Closing Keynote

Sue Atkins, Sopra Steria

A personal journey of Testing Enlightenment

This presentation takes a light-hearted look at my personal journey towards testing nirvana – the things that have influenced me and continue to drive me forward in my testing career.
I hope that by sharing my thought-processes and experiences you will be able to take away ideas to help improve your testing practice and gain confidence in your in-built testing skills.

***Sue** is a highly motivated test consultant having spent the last 25 years evangelising about testing. Her skills include performance testing, usability testing, test training and test process improvement. She has spent the last few years concentrating on bringing new testers into the fold and is the current chairperson of the Scottish Testing Group.*

Morning Workshop

Alan Richardson

"Learning in public" – a workshop to help you improve your presentation skills

Glossophobia, the fear of public speaking, usually ranks pretty high on surveys of 'what people fear'. And for good reason. We've all attended conferences where the keynote speakers were seriously injured after being hit by a torrent of rolled up feedback forms, or speakers were left bleeding from a rain of plastic name badges thrown Shuriken-like by the Ninja trained attendees.

You can learn to avoid these outcomes, and when you do, you gain a skill that will win you recognition, improve your job prospects and allow you to travel the world talking to fellow testers.

In this workshop Alan will provide hints and tips for improving your public speaking. Sharing, from experience, what works for him, and discuss some conventional wisdom on public speaking. Alan will also share a few secrets, and unconventional exercises that he uses to prepare. The Q&A sessions will allow attendees to have their most pressing questions answered.

What qualifies Alan to present this? Well, he now gives workshops and keynotes at conferences around the world, but he had to learn how to do that. He is not, and has never been, a natural public speaker.

Alan claims to have bought and read 100's of books on public speaking. Although a recent audit of his bookcase revealed that he has kept, because he loves the cover, exactly one. He has attended at least 3 public speaking courses (that he can remember), and at each he delivered some of the worst talks he has ever presented. But, he has worked at this for a long time, he has struggled, overcome fears and faced down on-stage disasters, and he has learned. Alan now classifies himself as an adequate public speaker and he can help you become adequate too.

Public speaking is a skill we have to learn in public, but it is a skill, it is learn-able, and it is a skill that you can learn.

Note: this workshop does not involve any embarrassing exercises, group hugs or filming of your presentations on VHS that you can watch when you return home.

***Alan** has more than twenty years of professional IT experience, working as a programmer and at every level of the testing hierarchy from tester through head of testing. Author of the books "**Dear Evil Tester**", "**Selenium Simplified**" and "**Java For Testers**". Alan also has created online training courses to help people learn Technical Web Testing and Selenium WebDriver with Java. 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*.*

Afternoon Workshop

Sue Atkins and Isabel Evans

Focus on state transition testing – a way to model your testing world!

Test design is a fundamental part of our toolbox as testers, whether we are working with exploratory approaches, designing scripts to be built into automation or carrying out manual scripted testing.

As part of the September SIGiST theme of “Increasing our capabilities” we are delighted to offer this masterclass workshop focused on one important test design technique:

State Transition Testing.

State transition modelling and testing is useful for understanding diverse types of application and events, such as movement between screens in an application, navigation around websites, and triggers for action in embedded systems.

In 90 minutes, Sue and Isabel will introduce the State Transition technique, show examples and provide you with exercises to try it for yourself. We both use this technique in our own testing, finding it can be applied to

- Review specifications and find potential defects and missing requirements;
- Derive a test basis from discussion of unwritten requirements and designs;
- Derive tests and expected results;
- Drive the direction for a non-scripted approach to test execution;
- Provide input to automated tests.

Sue *is a highly motivated test consultant having spent the last 25 years evangelising about testing. Her skills include performance testing, usability testing, test training and test process improvement. She has spent the last few years concentrating on bringing new testers into the fold and is the current chairperson of the Scottish Testing Group.*

Independent quality and testing consultant ***Isabel*** *has more than thirty years of IT experience in the financial, communications, and software sectors. Her work focuses on quality management, software testing and user experience (UX). She encourages 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 and story-teller at software conferences worldwide, Isabel is a Chartered IT Professional and Fellow of the British Computer Society, Programme Secretary of the BCS SIGiST, and has been a member of software industry improvement working groups for over 20 years.*

Morning Track Session

Daryl Elfield, KPMG

200 Peas in a Pod: implementing Scrum at Scale

Introducing the Scrum framework into any non-Agile organisation can be challenging. Implementing it on an in-progress, high-profile, multi-million pound platform migration is not recommended – but possible! This presentation will cover the size of the challenge, the solution deployed – and the benefits possible from using Scrum to manage the work of a 200 person testing team. We will explore how Scrum can be used to manage any phase of the SDLC, not just development – and how Scrum can be scaled with the right support, governance and tooling.

Three key points:

- Scrum techniques can be successfully applied beyond pure software delivery
- Scrum at scale (200 people) can work with the right governance, support and tooling in place
- Implementing scrum tactically can be a useful way to reduce the barriers to introducing agile techniques more widely across an enterprise.

Daryl *leads KPMG Testing Services, an innovative practice dedicated to accelerating business change. Daryl has over 20 years' experience working in the software testing industry, most recently for Direct Line Group, Deutsche Bank, Ernst & Young and Barclays. He believes passionately in the ability of testing to deliver better business outcomes for clients and customers*

Morning Track Session

Mike Harris, New Look

The Spin Bowler and the Agile Tester

The role of the software tester in an agile team is different to that of a tester in a waterfall team, but sometimes perceptions of what we do as testers are still on based on the roles in waterfall teams.

We need to be able to communicate our role in an agile team so that we can contribute as much as we are able to the projects we work on. I need to communicate this role across an international company. When I had a pre-season session with a spin bowling coach he used a model to show what a spin bowler does. I adapted his model to create a model on one side of A4 to show what an agile tester does, and used this as a communication tool.

I'd like my presentation to lead to a discussion. We should be asking questions such as:

- Who do we need to communicate with about our role?
- What do we want them to understand about our role?
- What techniques should we use to communicate what we do?

Come prepared to share ideas, and learn from each other.

***Mike** has just joined New Look as Test Lead. He was previously UK Test Lead / Global Practice Lead - Test at Crownpeak, where he lead the global testing community of practice. Before working for Crownpeak he also tested software for Shell, Kalido and ActiveStandards. He has been testing software since gaining a first class B.Sc. (HONS) in Applied Computing and Business Information Systems at Middlesex University. Before going to university he worked in sales and marketing for a number of years, and this helps him see issues from the business point of view. Mike is also an ECB Level Two cricket coach. You can follow Mike on Twitter: @TestAndAnalysis*

Afternoon Track Session

Niranjalee Rajaratne, Third Bridge

Is Quality All About Testing?

As software organisations grow it is vital that the quality is maintained. To cope with complex project structures and organisation hierarchy it's common to expand the testing teams and do huge investments in test automation.

Quality should be everyone's responsibility, but is it in reality? Testing has become one of the main characteristic of defining quality. QA teams are often seen as checkers. But Quality should not be all about testing; the business attitude towards testing, environment the testers have to work in and the processes we choose have an enormous impact on quality.

This story is about how we at Third Bridge found ourselves meeting required quality levels in a short period of time by fixing our broken links in our attitude, environment and processes. We found ourselves changing our approaches to how we do things and how we communicate. We are gradually building up a quality culture making quality to be everyone's responsibility. In this talk I will illustrate what was then, what we do now, what is quality for us, how the role is defined and what are our plans for the future.

Three key points:

- Quality has more to do than testing.
- Attitude towards quality matters.
- Pragmatic processes and practices, efficient test environments and infrastructure has an enamours impact on quality.

Niranjalee *is the Head of Quality Assurance at Third Bridge. Under her leadership the QA function at Third Bridge is being transformed into one where the QA team is less seen as checkers and more as quality champions who encourage everyone involved in the product development to think about and be responsible or involve in quality. Niranjalee values continuous development and believes; in order to be successful challenges needs to be taken that pushes one's limits. She holds an MBA and has over a decade of testing experience in financial markets, futures and options trading, e-commerce, publishing and consulting services.*

New Speaker Mentoring Scheme: two short talks

The BCS SIGiST runs a new speaker mentoring scheme, with four successful applicants selected and partnered with an experienced speaker to mentor them. In the September meeting, two of the 2017 mentees will present short talks during the afternoon.

Kieran Thandi, BBC

Mobile automation – less is more!

Having dabbled in automation particularly for mobile, I've come across some challenges that I would like to share. From device fragmentation to the overwhelming number of operating system versions and usability – so how do we get the balance with automation so we don't automate everything to the point it becomes meaningless?

I'd like to discuss an approach called PUMA that I have used at work at the BBC whilst working on the news app, that helps achieve this. Prove core functionality, Understood by all, Mandatory and Automated. As well as this I would like to talk about a very useful open source tool that will help other mobile testers overcome the issue of both device fragmentation / coverage and reporting.

- Manual testing especially with mobile should not be replaced with automation!
- Improve automation with having focus on PUMA, write meaningful tests that don't cause overhead.
- Open source tool to help coverage"

Kieran *is one of the BCS SIGiST 2017 New Speakers. She says; "I currently work at the BBC as a Dev in test. I have been working within QA and automation for around 5 years. I love mobile, like to attend regular meetups to learn about new tech within the industry. Also a STEM ambassador and is passionate about encouraging kids into tech, volunteering at different events."*

Kieran is mentored by **Rosie Sherrie**, Software Testing Club.

Emilija Strelcenia, Carestream Dental

Cyber crisis - what testers need to know

Cyber criminals are increasingly using web application weaknesses to compromise security! Do you understand the cyber risks that could put you or your organisation at risk? This presentation examines some of the current cyber security risks in web based applications, it explores methodologies to assess the extent of these risks and what QA Teams can do when testing or mitigating the unique challenges that are brought about by a cyber-crisis."
As well as this I would like to talk about a very useful open source tool that will help other mobile testers overcome the issue of both device fragmentation / coverage and reporting.

Emilija *is conducting research in areas of cyber-security, internet crime prevention and social intelligence. Over her career, she has held past positions in Leadership, Operations, Quality Assurance and Engineering in a wide range of sectors such as academia, e-commerce, manufacturing, and services. She has developed, implemented, administered, and validated a wide variety of computer-based solutions supporting critical regulated business processes. Emilija is currently working as a QA engineer at Carestream Dental. In her spare time, she devotes a portion of her free time to community service projects.*

Emilija is mentored by **Gordon Thompson**, Dyson.

Evening Presentation (joint with APSG)

Paul Chorley, Autotestpro

Challenges of Automated Testing: Structured Language Approach for Capturing of User Interaction

In an ideal world, the software development lifecycle (SDLC) and the creation of commonly produced artefacts at each stage would be fully automated. In the real-world, full automation is not possible due to the amount of human intervention required at each stage. However, one of the problems with increasing automation in this field, has been that traditionally the users functional requirements at the start of the SDLC, have typically been captured in an unstructured form; usually narrative text. As this narrative has no defined or repeatable structure, it does not lend itself to being automatically re-used in latter stages of the SDLC. A structured language for describing a user's interaction with a computer system and the expected outcomes of each interaction, enables these requirements to be 'captured once and used many times' throughout the SDLC, thus enabling document artefacts such as requirement specifications, development specifications, test scripts, acceptance criteria and user guides to be automatically produced. When this structured definition is fed into an automated testing engine that understands this language, the desired system behaviour can be automatically verified, leading to significant productivity, speed and quality improvements.

***Paul** is a seasoned IS / IT professional with just over 20 years' experience in all aspects of IT, from architecting, designing, developing, testing, delivering, managing and directing large complex IS / 'IT projects and programmes. He has worked for global IT corporates such as Unisys and EDS/HP and independently with his own consultancy company, helping companies including Rolls-Royce, UK MoD and Six Degrees Group with strategic transformation programmes. He has a track record of successfully recovering severely trouble stricken projects and programmes using a combination of sound application of the SDLC and building strong collaborative teams. Paul is currently Managing Director and Co-founder of Autotestpro Ltd, a company which has developed a patent pending and highly innovative solution to automate the Software Delivery Lifecycle (SDLC)..*

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

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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Obituary: Richard Warden (10 May 1950 – 20 March 2017)

We are sad to inform you of the death of Richard Warden, who contributed significantly to the testing industry and to the BCS SIGiST.

Richard was a tester, but he was more than that. His contributions to the industry were both significant and ground breaking. He worked as a practitioner, in addition he provided consultancy and training. He also undertook original work to develop new methods and techniques in the areas of testing and staff motivation. His work spanned the major IT disciplines. At the heart of what he wanted to achieve in the industry were the solutions to "Wicked Problems" - that is problems where introducing a solution causes other problems to occur, particularly where those affect people. He brought that attitude and thinking into his work with Isobel Nicholson on the Motivation of, and Job Design for, IT staff. He was a major contributor to the Motivational Surveys of 1994 and 1996. In 1994, they published the first Motivational Survey of UK IT Quality Practitioners followed in 1996 by a wider study, the Motivation Survey of IT staff. These led to the implementation of their MIP (Motivation Improvement Process) and to follow-up papers on motivation risks in quality initiatives and for IT Infrastructure [1].

> Isobel Dunbar (Nicholson): *In 1994-96 Richard and I ran a survey of over 250 software staff, including software testers. Richard put an enormous amount of time into arranging before and after visits to five interest groups. More valuable than his work on this complex survey was the wisdom and knowledge that he contributed to our subsequent report and motivation improvement program. It was typical of Richard that he felt for people who persevered with jobs that were not designed to motivate them. Then he worked carefully and patiently to improve their situation.*

He contributed to ITIL by researching and drafting of the IT Infrastructure Library modules 'Testing an IT Service for Operational Use' and 'Software Lifecycle Support'. He worked on improvements to software maintenance methods and on GQM metrics for the monitoring, control, and improvement of testing activities. [2]

> Isabel Evans: *I first met Richard when we worked together at K3 Group Ltd, we were both focused on software quality, and both seeking to define and implement meaningful improvements in the company, in testing, software maintenance, and process efficiency. After we both left K3 in 1991, and separately started independent consultancies, we continued to work together on a variety of research and industry projects. He was generous with his time, and in providing me with access to many useful resources. He encouraged me to have the confidence to speak and publish new work; for example, in the early 90's I helped him develop the Testing Assessment Programme (TAP) to assess and improve the performance of an IT testing organisation against SEI CMMI. We had lively discussions about UML, testing, the meaning of the word "quality", and the best way to apply metrics during process improvement!*

When UML was introduced as a methodology, Richard immediately started to analyse how using UML might change the testing activities and artefacts in an IT project. Richard ran the UML Testers' Forum from before 2005 until June 2008; the group became part of the SIGiST in

2006. He ran a UML Testing Workshop for SIGiST in June 2005, and did a presentation at SIGiST in June 2003 plus presentations at EuroSTAR in 2004 and 2005 on the problems and challenges for testing and testers of UML, and urged testers to speak out for quality. [3]

> Steve Allott: *Richard was extremely helpful to me when I first started my own training company and he delivered excellent UML testing training courses for my clients. Feedback was always very positive and he was very enthusiastic and passionate about his subject. We enjoyed the odd drink (or two) together after work and I did appreciate the fact that one of his rules was no talking about work after 7pm…*

He applied all his experience and learning to contribute to the discussions around the place of Quality and Management in agile projects, noting *"one cannot live by Scrum alone"* and *"risk does not go away if you are agile"*. He discussed what goes wrong when agile principles are only partially applied – for example iterating but not involving the users – and reminded us that IT problems are often wicked problems that do not have simple solutions, and that applying agile methodologies is not an excuse to ignore project complexity or the need for controls. [4]

Born in 1950 in Shanklin, Isle of Wight, Richard attended school in Shanklin and then Sandown Grammar before studying Chemistry at the University of Kent at Canterbury from 1968 until 1971. In 1980, he married Cynthia Douglas, and their two children, Adam and Rosalind, were born in 1983 and 1986.

Richard wrote and tested his first computer programme in 1970. He joined the RAF (direct graduate entry as a pilot officer) and was trained in personnel management and leadership. Based initially at Uxbridge and West Drayton, working at the MOD in London, and then from September 1975 at Innsworth near Gloucester, on defence systems. His station work was as a flight commander. Subsequently he was assigned as a systems designer and analyst/programmer on a very large mainframe defence support system, written in COBOL to run on an ICL 2900 under VME/B. Following promotion to flight lieutenant he was appointed second in command of the systems commissioning team, working on the acceptance testing of large systems.

He worked at Racal Redac in Tewkesbury from 1979 to 1986, first on business systems and then on interactive computer-aided design (CAD) systems. Richard implemented a new quality assurance department that encompassed all aspects of software and hardware QA, customer service quality and supplier/vendor quality.

In 1986, he joined K3 Group Ltd. He worked there as a product and research manager until 1991, contributing to initiatives on quality improvement, maintenance life cycles, metrics, and other projects. Richard worked on a project to design and implement a fast moving, iterative, but controlled process for managing software maintenance: The MAINSTREAM product. This was highly successful for the organisation and its clients, and stands as an early (1980's) precursor to Agile-type approaches.

In 1991, he started his own company, Software Futures Ltd, and worked in a wide variety of consultancy, delivery, and training engagements, with clients including Thomas Cook, Royal Bank of Scotland, BT Exact, Thales, Fujitsu Services, Lex Vehicle Leasing, Swiss Exchange (in conjunction with Sema4), Durham Systems Management Ltd, the CCTA, Software Design Associates Ltd, Recognition Systems Ltd, Innate Management Systems Ltd and Ordnance Survey. He worked hands-on as a test manager and tester, planning, designing and executing tests. These practical experiences informed his writing and teaching.

Richard had boundless enthusiasm for everything that interested him – testing, UML, motivation studies, metrics, astronomy (he was the founder member of the Cotswold Astronomical Society in 1982), playing the organ, singing in the choir, Nordic walking (he qualified as an instructor in 2010), steam trains, coin collecting, RAF history and the care & maintenance off his beloved ginger cat, Jack … and he brought that enthusiasm and his formidable intellect to his work, and to post work discussions in his many interests. We will miss him.

[1] Publications on motivation include:

- Warden R.H. & Nicholson I., MIP Report Volume 1 - 1994 Motivational Survey of UK IT Quality Practitioners, Software Futures Ltd, December 1996.
- Warden R.H. & Nicholson I., MIP Report Volume 2 - 1996 Motivational Survey of IT Staff, Software Futures Ltd, December 1996.
- Warden R.H. & Nicholson I., "IT Quality Initiatives are at Risk!", Quality World, March 1995, pp 171-174.
- Warden R.H. & Nicholson I., "Quality, Motivation and the IT Infrastructure", ITIMF Newsletter 13, June 1995, pp 14-15 and Newsletter 14, September 1995, pp 8-9.
- SIGiST Table Talk: "People Issues - Testers are Human Too" (July 2003)

[2] Publications for ITIL:

- IT Infrastructure Library module 'Testing an IT Service for Operational Use'.
- IT Infrastructure Library module ‘Software Lifecycle Support’.

[3] Publications and presentations on UML testing include:

- The use case problem – time for testers to speak out (EuroSTAR 2005)
- Reviewing UML as part of the project team (EuroSTAR 2004)
- The challenges of testing UML based systems (BCS SIGiST 2003)
- UML test strategies (Testing Times and Unicom)
- Workshop: "UML: How do we test from Use Cases?" (BCS SIGiST June 2005)
- Presentation "Are You Ready for Model-Based Testing?" (BCS SIGiST March 2006)
- Workshop: "Reviewing UML Analysis Models for Testability" (BCS SIGiST March 2007)
- Workshop: "How can UML help us to test?" (BCS SIGiST September 2008)

[4] Publications on Agile and Quality include:

- “The basic rules of quality and management still apply to Agile “(chapter 16 of John Watkin’s book “Agile Testing: how to succeed in an extreme testing environment”)

Donations in memory to Beckford Nature Reserve www.beckfordnature.org.uk

Challenges for Test Managers in Changing Roles

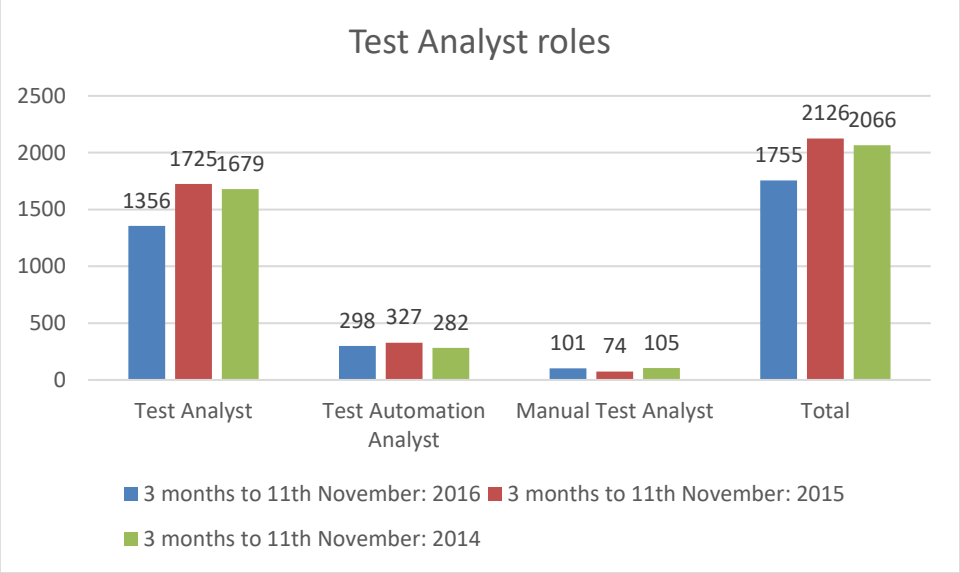
Steve Watson

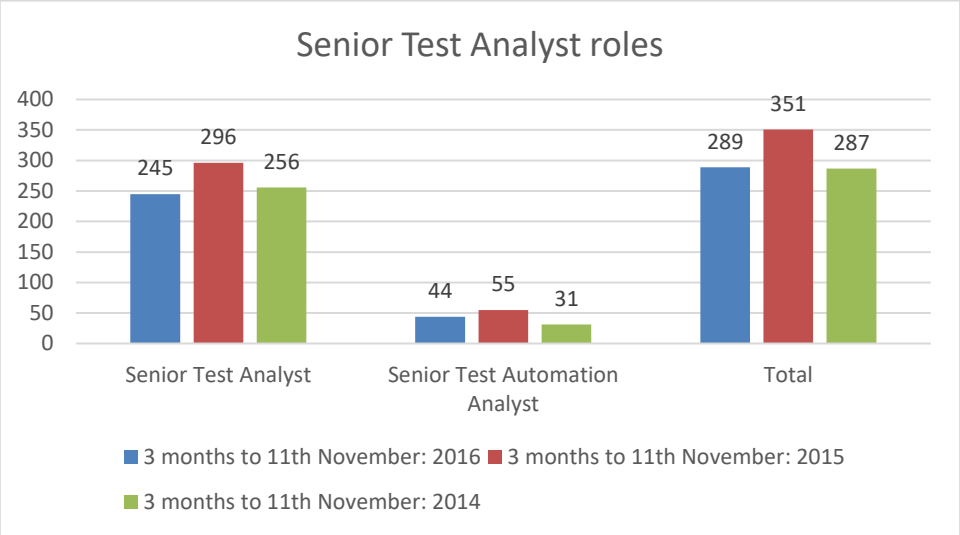
This was the title of the talk that I was invited to give at the December 2016 SIGiST conference. It was part of a day's worth of really good sessions based around the "Challenge yourself" heading. As a Test Manager of 8 years, I wanted to discuss the declining number of Test Manager roles, as it is not something that is necessarily being widely spoken about, but it is something which we need to be prepared for. So, I designed in a number of discussion slots to make it an interactive session, with the audience arranged into groups.

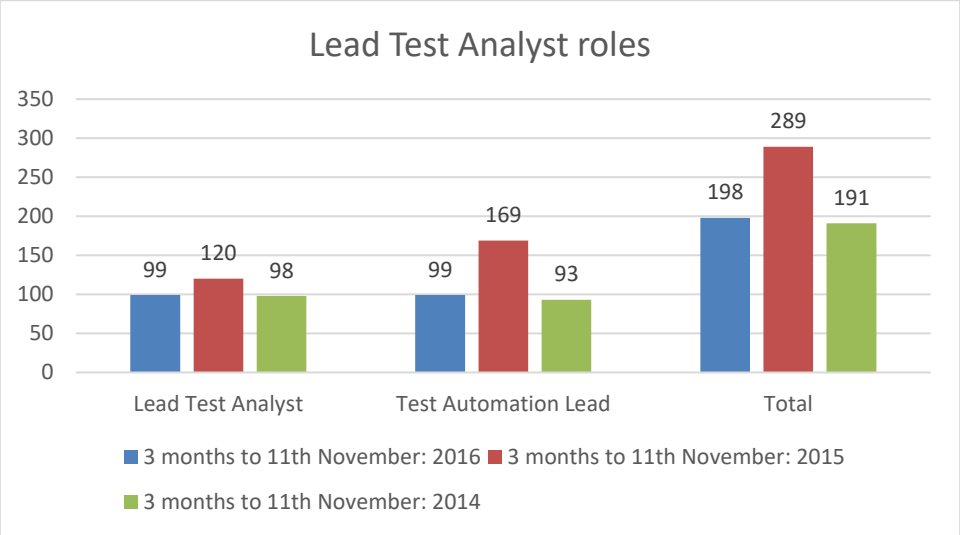
After the general introductions, we briefly did a poll to ascertain how many people were Test Managers (around 1 in 3) and also how people came to be working in testing. It is always interesting to see how many people started off in a business unit, being asked to help with User Acceptance Testing and transitioning into a full-time testing role.

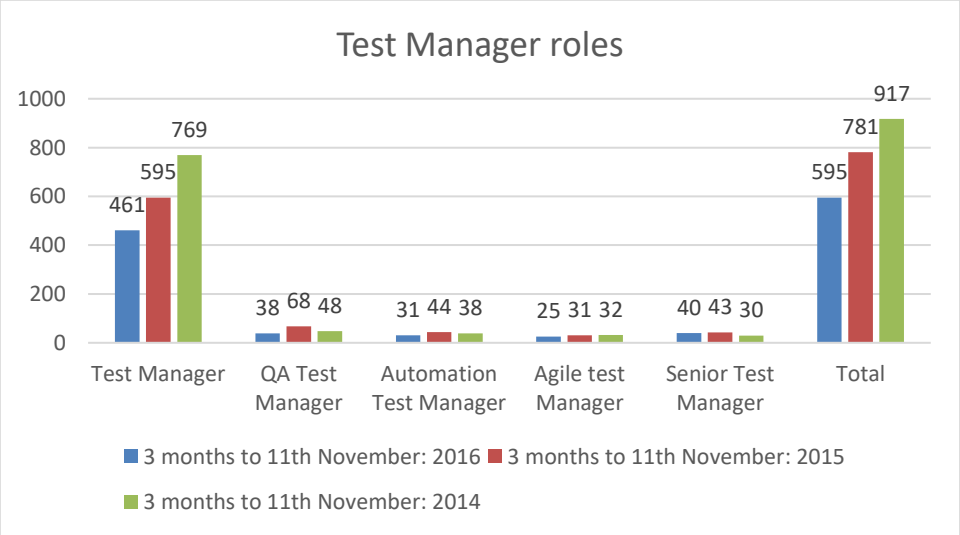
A decrease for the need of Test Managers?

The main point of the presentation was the reduction in the number of Test Manager roles. In order to illustrate this, I performed an ITJobswatch study, collating the statistics for the number of permanent Test Analyst, Senior Tester, Lead Tester and Test Manager roles in the 3 months to 11th November 2016, compared to the same periods in 2015 & 2014:




Senior Test Analyst roles
400
350
300
250
200
150
100
50
0
245
296
256
44
55
31
289
351
287
Senior Test Analyst
Senior Test Automation Analyst
Total
3 months to 11th November: 2016
3 months to 11th November: 2015
3 months to 11th November: 2014


Lead Test Analyst roles
350
300
250
200
150
100
50
0
99
120
98
99
169
93
198
289
191
Lead Test Analyst
Test Automation Lead
Total
3 months to 11th November: 2016
3 months to 11th November: 2015
3 months to 11th November: 2014


Test Manager roles
1000
800
600
400
200
0
461
595
769
38
68
48
31
44
38
25
31
32
40
43
30
595
781
917
Test Manager
QA Test Manager
Automation Test Manager
Agile test Manager
Senior Test Manager
Total
3 months to 11th November: 2016
3 months to 11th November: 2015
3 months to 11th November: 2014

I selected a number of role descriptions in order to get a balanced view, as organisations will use different descriptions for similar jobs.

The study showed that the number of Senior Test Analyst and Lead roles were quite flat over the 2 years, Tester roles were down on 2014 and 2015, but the biggest change was that the number of Test Manager roles has DECREASED by 35% in 2 years.

This formed the first group discussion points, looking at four questions:

1. What do you make of these figures?
2. Why are there less test manager roles?
3. Where are Testers, Seniors and Leads going to go?
4. What about existing test managers?

SIGiST volunteers kindly took notes from the Group discussions and these were the ideas shared:

• Agile moving away from using this job title – using Test Lead, Test Evangelist or Test Architect roles to cover responsibilities	• Testing and automation within other roles, so less defined Tester specific roles
• Roles are being merged	• More specific role demands (less generic Test Manager roles)
• People are not moving jobs	• Perception that less resources are needed to manage
• More testing outsourced to third parties, nearshoring and offshoring	• Swings between permanent and contract roles
• Brexit factor?	• Cost cutting/economic factors
• Testers moving into delivery teams, and no specific Test teams	• Managers looking for career changes – possibly becoming Project managers
• Shift left, right, *etc*.	• Developers doing a better job so less testing needed?
• R&D budgets reduced = less testing	• Post Y2K and Post Dotcom boom and bust cycles
• Is the complexity of testing reducing?	

It is clear that there are many factors behind the decline in the number of permanent Test Manager roles, but the underlying trend is clearly visible.

My personal experience as a Test Manager is with a team of 9 where I do not manage their day to day activities. I am responsible overall for testing – the approach, tooling, recruitment, appraisals *etc*., but the Agile teams self-manage their activities, and I have less visibility of the individual tasks. I believe that this is more commonplace now and is one of the factors contributing to a decline in the number of traditional Test Manager roles.

My responsibilities remained Testing focussed until mid-2015 when an unexpected opportunity came my way to take on Product Management tasks alongside my existing TM role. A new product was being built and tested by our delivery partner and then shipped to us for acceptance testing, so it was felt that this would be a good fit for me.
It was a big learning curve as I was now responsible for working with commercial stakeholders, a delivery manager and release teams to ensure that we delivered a product to market that met the business needs, as well as overseeing the testing. It also had an immediate impact on the amount of time I could dedicate to managing the team. I found that I was spending between 40 and 70% of my time some weeks on the product, simply because of the number of management tasks I needed to perform, and questions / issues that had to be dealt with.

Whilst I needed to learn a number of new skills, once I started in the role I found that there were skills I already possessed as a Test Manager that I could use. The problem was that I was more concerned about the skills that I lacked, and I felt that this was a common problem which can dent confidence – we tend to worry that we lack the skills to take on something new, focussing on the negatives and not on the positives.

Can Test Manager skills be used elsewhere?

Our second group discussion point therefore was this question: “What skills do we have as Test Managers that can be used elsewhere?” These were the ideas shared:

• Stakeholder management / Managing expectations	• Product training and knowledge / Domain knowledge
• Communicating to people – business & technical	• Information flow
• Analytical mind	• Risk awareness
• Co-operation	• Agile working
• Work prioritisation	• Crisis management
• Planning	• Coaching
• Negotiation	• Conflict resolution
• Insightfulness	• Diplomacy
• Confidence	• People management
• Quality perspective	• Realism in timescales
• ‘Tester in the middle’	• Holistic thinking

It was interesting to gather so much feedback on the skills we already possess but may be unaware of, and I could see where I had made use of many of them. I feel that if we are to make the most of the opportunities presented to us, we must develop a better awareness of our own skillsets.

New tasks and role present new opportunities to upskill, and this was the case for me. I needed to develop a number of new skills in order to do this job:

- Managing stakeholders – the need to question things.
    - Do you really need that? When do you need that by? Is it vital for go-live?
- Managing a delivery partner, ensuring decisions were made and communicated, deadlines met, questions answered.
- The different types of communication: what information was need, by whom, by when and in what format?
- Managing changes to scope (change requests) and the impact on the schedule.
- Managing the steps needed to go live as I had no experience of this.
- Once the project was delivered, transitioning into a BAU mode, with sprint cycles.

The benefit of taking on something alongside my Test Manager role has been an increased exposure to commercial stakeholders – and they are now more aware of the value of testing. I also get to see how our customers use the product and can influence how the product evolves. It means I can now manage a broader range of tasks, rather than just those relating to testing activities, so am more of a general 'IT' Manager. This also means that it would be easier to transition into a different type of management role within IT, rather than just looking at the field of Testing, giving greater career options and scope.

What does the future hold?

The role of a Test Manager has changed dramatically within Agile delivery teams; however, I remain convinced of the need for a role which focuses on:

- Enabling testers to do their work - removing obstacles.
- Governance of the testing process.
- Recruiting testers.
- Coaching and mentoring the team.
- Setting goals, objectives and stretch tasks.
- Ensuring the team are trained.
- Ensuring testers have an independent voice.

Our final discussion looked at the following points:

1. Do you agree that there is a need to cover these?
2. If not a Test Manager, who will do the above?
3. What does the future hold?
4. What concerns do you have?

This was the feedback:

• Test Manager looks after the Team, Stakeholders, releases, the testing	• Without a structure, how do we develop as testers?
• Who sets goals, objectives?	• Mentors and coaches are needed
• Concern over testers working alone with no support	• Every tester needs a voice – how achieved without a Test Manager?
• Need to showcase testers work	• Spotify model using Chapters?
• "The activities stay, the titles change"	• What is appropriate to the working culture.

These are valid points, and we cannot predict whether Test Manager roles will still exist in the future, so we need to be prepared to support others who will manage testers, and look to where we can use our skills perhaps in other roles.

Summary

My advice to anyone who is considering future career options is to keep an open-mind, and consider roles that traditionally would not have been a natural career step, particularly within the career ladder approaches we have been used to.

Step back and think about:

- Which activities do you enjoy most.
- What gives you a sense of achievement each day.
- Where and when you are making the best use of your unique skillset.
- What new tasks or roles would you like to try.

It's up to us to take up the challenge and be prepared to define our own career paths.

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.

LinkedIn/sjwatsonuk @sjwatsonuk

15 minutes with ….

Hiedi Homan – Programme Test Manager

Jennifer Wheeler of TestingProfessionals.com spent 15 minutes with **Hiedi Homan**, Programme Test Manager, talking about her career in testing so far.

How did you get into testing in the first place?

I was involved in a Y2K project assessing printing presses at a printing and publishing company, making sure they were fit for the new millennium. Some of the presses had no documentation due to their age and a number were from overseas with documentation in a foreign language. My work was mostly focused on finding out what upgrades had been undertaken and contacting the suppliers to ensure all changes were Y2K compliant. It was really interesting liaising with people in different languages and in different countries. The project ran for a year, once completed I was told about a Test Management role they were recruiting, I applied for it and was offered the position on a 6 month trial basis. I really enjoyed the role and my career took off from there.

What do you think helped you develop your career the most?

Having a couple of fantastic mentors. One particular Test Programme Manager was fantastic. He was passionate and enthusiastic about quality assurance and passed on his enthusiasm, teaching me to not being afraid to ask questions or admit you don't know something. If I can pass on my enjoyment of testing the way he could then that would be fantastic. He was never afraid to say he didn't know something and was really human.

I see you have the ISEB Foundation and Intermediate Certificate in software testing, you are a certified Scrum Master and ITIL certified too. Why did you decide to invest in those qualifications? Do you think having them has helped in your career development and if so in what way?

The ISEB qualifications were financed by employers to demonstrate that they invest in their people. I have never got around to taking the Test Manager qualification, I don't know if I shall. No one has confirmed if having the qualification was part of the decision-making criteria when I was being assessed for a role.

Having the structured training has helped me verify that my understanding runs in line with industry standards which was helpful and once you understand a standard approach/process then it makes it easier to see how you can adapt it to 'get the job done', it can also help you to then 'think outside the box' and tailor it so you adopt the best approach for each project/programme.

ITIL was self-financed as a result of a Customer Acceptance Test phases where OAT was covered by the Service Desk Team and I wanted to know more about the department that I was feeding into.

You have worked in software testing for 19 years what advice would you offer people at the beginning of their testing careers who are keen to travel down a similar path to Test Management?

Don't give up and be prepared to go the extra mile. If you take pride in doing the best job possible, reporting factually and honestly then people will learn to trust you. If a project status is not as stakeholders were hoping then to go to them with the facts along with an action plan to remedy the situation demonstrates integrity and ability.

I have worked in environments where the stakeholders had previously been severely let down by people not delivering bad news or sweeping issues under the carpet, by the time our programme was delivered it was nice to be told that I was seen as their conscience. They said, 'we may not always like what you have to say but we can trust you totally', this in my book is success.

Staying up to date with new approaches to testing, tools etc. can be a full-time job in itself. How do you stay in touch with what is happening in the market?

As testing becomes more tailored to meet company/project requirements the approaches differ, it can be challenging to stay abreast of new developments within the industry. I am involved in organising and attending testing conferences where you tend to meet passionate and interesting people. I also attend webinars whenever possible. Picking people's brains is a great source of information because you tend to get 'real life' scenarios, both good and bad. Talking with people at work about their background and experiences is great. I am fortunate that I can pick up new technologies and techniques quite quickly. Tools can be used with great benefit and sometimes the same tool can be used in such a way that it gives no value at all. Tools should enhance the process and not dictate the process. Sometimes more importance can be put on the tool than the process and that can potentially create issues.

Can you tell us a little about your most recent / current role and key responsibilities?

I have just completed a Test / QA / Programme Test Manager contract with the Rail Delivery Group (RDG) overseeing Customer Acceptance Testing on behalf of and with the train operators, retailers and ticket suppliers, in total over 35 companies. Budget – all multi-million projects (£3 million - £22 million each) – Consisting of single projects and programmes including up to 5 projects.

- Led acceptance and Quality Assurance testing teams across multiple dispersed locations
- Ensured the integrity of migrated data for train fare setting equating to around 855,000 fare products and 20 million individual fare options at the Ticketing Information System
- Delivered a cloud based data capture and apportionment system for settlement across operators.
- Test Managed the migration of a 'ticket on departure' service handling annual ticket sales of £1.8bn at point of migration with the ability to process a billion tickets annually. Successful implementation of a 24x7 mission critical system requiring the connection of over 4000 Ticketing machines with over 40 stakeholders
- Identified and filled the project team's skills gap in relation to test and implementation, that enabled completion of UAT and cutover to 'live' being achieved on time

Working at the Rail Delivery Group was very challenging and rewarding. I met some fantastic people and I learnt a lot about the rail industry. Prior to this I set up and completed E2E and UAT in 6 weeks in a domain with no prior industry knowledge where 2 previous attempts had failed.

What do you most enjoy about heading up a testing practice?

I love seeing people grow within their roles and expand their abilities. It is great to hear questions that new people bring with a fresh pair of eyes and what that can add to a team. They don't have the baggage of previous projects within the environment which can be beneficial.

Working with non-technical stakeholders to deliver UAT can be brilliant. Some of our previous stakeholders had limited PC knowledge which adds a completely new dimension when they are assisting in UAT. To take that scenario and be able to give them workable UAT activities is fascinating. I have found in certain circumstances that using experienced testers for UAT for support is essential but to replace the end user as sometimes happens can mean that the true user is sometimes overlooked, I feel it is better to use non-technical user community with the correct business skills supported but a UAT analyst may take a little longer but ultimately provides and better trust in the system and your delivery with the end users.

You choose to work on a contract basis rather than in a permanent role, is there a particular reason for this?

I enjoy working on a project/programme basis because it enables me to concentrate on the project without being crowded by the politics which can sometimes exist within companies. You are there to do a job based on your skills.

Would you be happy for people to contact you with questions or to discuss projects?

Yes indeed, I would be very happy to chat about my experience or help in any way, I can also be available for new projects. My email address is Hiedi.Homan@BCS.org, I can also be found on LinkedIn - LinkedIn/HiediHoman/

HH Test Consultancy

For help and assistance in any aspect of Testing career planning or recruitment please contact Jennifer Wheeler at Testing Professionals.

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What is “Advanced Programming”?

Dr Geoff Sharman, BCS APSG Committee Member

The BCS SIGiST is jointly hosting an event with the BCS Advanced Programming Specialist Group on the evening of 14th September 2017 at 6 pm, following on from the SIGiST one-day conference. Here, Dr Geoff Sharman, APSG Committee Member, discusses the themes that the APSG has been concerned with over the long history of the Group.

The BCS Advanced Programming Specialist Group is one of the oldest BCS groups and has met every month since its foundation in December 1959; In fact, it was originally labelled “BCS Group 5” and only adopted its current name in later years. So, what has been its focus over almost sixty years?

Looking back over the records of our meetings, it’s clear that our central theme has been the design and construction of applications and software, although the “pressure points” affecting that process have varied. The problem for application developers has always been: how can we describe what to do succinctly and efficiently? How can we ensure that our descriptions are unambiguous and easily verified? And how can our programs help to identify and clarify the concepts and methods which an organisation uses to conduct its operations, allowing executive level endorsement of applications as well as technical level verification. APSG has always sought to track that moving target, rather than becoming wedded to a particular technology of the day.

In the first decade, we were almost exclusively focussed on the design of programming languages and that has remained a significant concern to the present day. Application programmers have always had to master multiple languages, evolving from assembler languages, through machine-base Autocodes, procedural high-level languages, object oriented languages, and functional programming languages. The aim has been to improve the expressive power of languages, to improve the execution efficiency of programs written in those languages, to broaden the range of environments within which these languages can be applied, and to move verification towards the point where it becomes a matter of inspection and proof, rather than detailed testing of each possible case. We know that fully exhaustive testing is never possible and usually fails to shed light on the inner workings of a piece of software.

In the second decade, the 1970s, we saw an intense interest in data structures and database management. How do those data structures model the “entities” or abstractions which an organisation recognises as the essential objects of its activities, whether they be orders and invoices, components and assemblies, people and organisations, or processes and services? This decade closed with a wide consensus on Relational database architectures as the best accepted method of capturing those abstractions, but that consensus has proved to be temporary. Some never accepted the Relational orthodoxy, others sought more sophisticated structures for “knowledge representation”, and still others pointed to the everlasting dichotomy between structural sophistication and execution efficiency. Can the extraction of “knowledge”

become simply a matter of logical deduction, if the data representation is adequately structured? Or do operational pressures continue to demand simple and efficient structures? These concerns have come full circle in recent times. The scale and demands of “big data” analytics frequently override the structural aspects which would facilitate interpretation, and we continue to debate these topics.

In the 1980s, we saw a growing interest in formal specification of application systems with the hope that the verification of these systems could become a matter of automated proof. Great strides were made and these methods continue to be applied intensively in some particular environments, such as safety critical systems including air traffic control and, more recently, VLSI design. But these methods were never adopted across the broad spectrum of applications, for two key reasons. The first is the cost of applying them, which is only justified for very critical systems, but the second, more important, reason is that it is rarely possible to “freeze” the requirements for a given system at a point where they can be formalised and verified. Requirements change all the time and subsequent practice has placed much greater emphasis on iterative development methods with continual re-evaluation of requirements as well as programs.

Over subsequent decades, these themes have been re-visited many times and we have also looked at a broader set of issues: How do end users interact with applications, across a wide range of devices and networks? How can applications scale across those networks and across the increasingly multi-CPU chips which are employed in both servers and end user devices? How can machine learning and “connectionist” neural net architectures be used in real applications? Whilst the AI community points to successes in some specific environments, broad adoption of these techniques in real-world applications is still some way off and presents genuine problems. If we cannot say what an AI has learned by analysing a large corpus of data, or how it has applied this learning to a specific business decision, what hope is there of verifying its actions?

APSG is proud to have hosted many “famous name” speakers over our history, and to have “spun off” a number of other groups which focus on more specific themes. Our “moving target” focus has helped us to identify the topical issues of the day, and is still needed in an age where even greater demands are being placed on application architects, designers and programmers. It is still hard to identify orthodox development methods which will lead to success and help us avoid being part of those project “horror stories” which still occur.

Dr Geoff Sharman holds a PhD in Particle Physics from Southampton University and spent 35 years in the software industry, working on the development of programming languages, networking systems, database management, and transaction processing systems. He eventually became responsible for the strategic direction of IBM’s billion-dollar CICS software business, which involved regular contact with customer executives worldwide. He also sponsored and participated in academic research work and held the post of Visiting Professor in Computer Science and Information Systems at Birkbeck College, London, from 1982 to 2012. He is a past chairman of the British Computer Society’s Advanced Programming Specialist group and a current committee member.

Advanced Programming Specialist Group

Event Listings

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

2017

September

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

October

STARWEST
1 - 6 October 2017
Anaheim,, US
https://starwest.techwell.com/

SIGiST
"Northern Lights"
18 October 2017
Leeds, UK
http://www.bcs.org/category/9264

November

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

Agile Testing Days
13 – 17 November 2017
Potsdam / Berlin, Germany
http://www.agiletestingdays.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.

December 2017

Specialist Group in Software Testing

THE TESTER

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SIGiST Winter Conference
Friday 1st December 2017

From the Editor

Welcome to the ***SIGiST*** and ***The Tester***.

As mentioned in the September editorial, the mission of the SIGiST is to support the Testing Community. Following feedback from previous conferences we have changed the format of the December conference and are offering everyone a full afternoon workshop, presented by leading international consultant and trainer, **Erik van Veenendaal**. Erik will run a hands-on workshop, with exercises, on risk-based testing, aimed at both traditional and agile software development approaches. The workshop fees are very low for this amazing training and development opportunity, and students can come for free! Book now!

Along with the abstract for the workshop, in The Tester this month we have two articles, one from the National Physical Laboratory and one from UST Global.

The committee are grateful for the contributions from the sponsors of the SIGiST.

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. The booking system accepts multiple and third-party bookings.

Book Now!

Join our Linked-In Group:

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Conference Agenda

BCS SIGiST – Winter 2017 Conference – Friday 1st December 2017
BCS 1st Floor, Davidson Building, 5 Southampton Street, London. WC2E 7HA.

Time	Session
12:30	Registration, Coffee, Tea & Refreshments
12:45	***Vendor presentation – Ten10***
13:00	***Welcome – Stuart Reid, Chair, SIGiST***
Afternoon	**Workshop**
13:00	***Plenary workshop*** **Practical Risk-Based Testing** Erik van Veenendaal Improve IT Services BV
14:45	Coffee, Tea & Refreshments
15:00	***Plenary workshop continues*** **Practical Risk-Based Testing** Erik van Veenendaal Improve IT Services BV
17:00	***Close of the day meeting – Stuart Reid, Chair, SIGiST***

The SIGiST committee reserve the right to amend the programme if circumstances deem it necessary.
The workshop is open to all.

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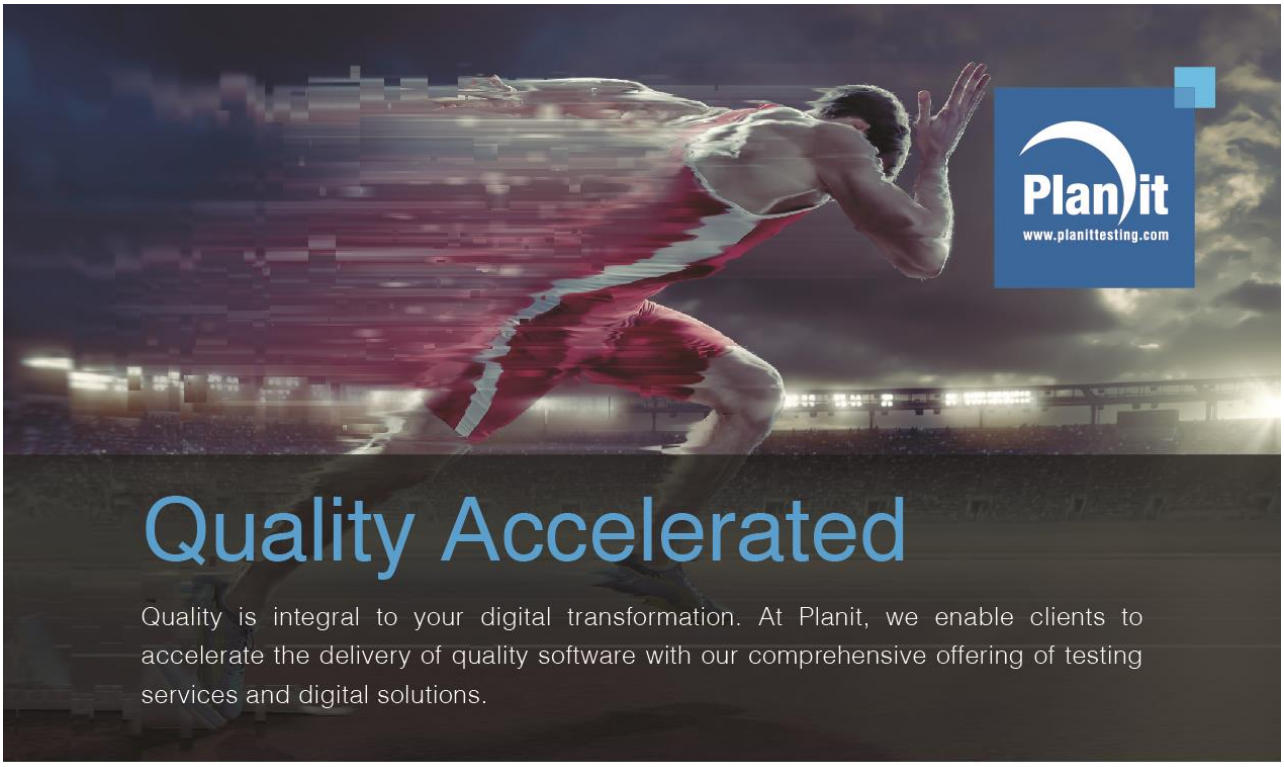

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The SIGiST Committee would like to thank NHS Digital for being a sponsor of the Northern Lights Conference in Leeds in October 2017

SIGiST Conference Venue

The December 2017 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

Workshop Abstract and Speaker Biography

Plenary Workshop!

Erik van Veenendaal

Improve IT Services BV

Practical Risk-Based Testing

Although most projects implicitly use some kind of risk-based approach for prioritizing testing activities, critical testing decisions should be based on a thorough product risk assessment process with key business drivers as the foundation.

Erik van Veenendaal presents PRISMA — PRoduct RISk Management — a practical method for performing systematic product risk assessments. Erik describes how to carry out risk identification and analysis, and explains how to use the outcome to select the best test approaches.

Learn how to use PRISMA in both traditional and agile projects, including creating an agile sprint test plan. Erik shares his practical experiences, the problems he's overcome, and results he's observed employing product risk assessments.

Learn how to optimize your test effort by including product risk assessments in your testing practices. Develop a rigorous approach to inform project stakeholders about important testing decisions and provide clear visibility on product risk status.

Erik (www.erikvanveenendaal.nl*) is a leading international consultant and trainer, and a recognized expert in the area of software testing and requirement engineering. He is the author of a number of books,* e.g.*, on risk-based testing, and papers within the profession, one of the core developers of the TMap testing methodology and the TMMi test improvement model, and currently the CEO of the TMMi Foundation. Erik is a frequent keynote and tutorial speaker at international testing and quality conferences. For his major contribution to the field of testing, Erik received the European Testing Excellence Award (2007) and the ISTQB International Testing Excellence Award (2015). You can follow Erik on twitter via.* @ErikvVeenendaal

Verification of mathematical software via the internet

Ian Smith and Keith Lines, National Physical Laboratory

Introduction

Increasingly, decisions are being made based on the results of processing measured data. For example, in the home, a smart device makes the decision to switch on the central heating in a room after analysing a number of temperature readings taken at various locations in that room. On a global scale, temperature measurements recorded worldwide are combined to provide evidence of climate change and influence government policy at national and international levels. A key feature of the analysis of measured data to reach decisions is the reliance on software to undertake mathematical processing of that data. It is clearly imperative that this software is verified, i.e., shown to be implementing calculations correctly.

This article describes an approach developed as part of a recent European research project for the verification of mathematical software, i.e., software that implements a (mathematical) computational aim. While the project was primarily concerned with software used to analyse measured data, the approach developed is equally applicable to general mathematical software.

NPL's interest in software verification

The National Physical Laboratory (NPL) [1], as the UK's National Measurement Institute (NMI), is responsible for developing and maintaining the nation's primary measurement standards. Software verification is an activity of considerable interest at NPL because of its role as a developer of software. NPL scientists generate large volumes of measured data. Often, that data needs to be processed in a bespoke manner and software for such a task is not commercially available. Software must therefore be developed and tested for its fitness-for-purpose "in-house". Additionally, software developed at NPL is often made externally available, for example, to support a standard, or to control an instrument. Again, such software must undergo appropriate verification prior to release.

For several decades, the Data Science Group (DSG), and its predecessors, at NPL have had particular interest in the verification of mathematical software. Much research has been carried out both on approaches for the generation of data to be used for verification and on metrics that provide a numerical assessment of the performance of software. The DSG has also been approached by developers of commercial software packages to undertake independent verification of functions within their software. A company for which verification of a software component has been successfully undertaken may then refer to that verification, e.g., on its website, within its marketing material, etc., to maximise the confidence of potential purchasers of their products. Other NMIs, such as the Physikalisch-Technische Bundesanstalt (PTB) [2] in

Germany, have also carried out similar assessment of the performance of commercial software. In some cases, companies have asked more than one NMI to undertake verification of a particular software component.

Advances in technology have allowed the verification process to become more efficient. For example, in the past, reference data and test results were stored on physical media and transported between the software developer and the NMI. The availability of e-mail subsequently allowed data and results to be shared electronically. More recently, the availability of the internet has provided the opportunity to automate further the verification process.

The TraCIM approach to the verification of mathematical software

The research project "Traceability for Computationally-Intensive Metrology"[1] (short name "TraCIM") [3], funded by the European Union, ran from 2012 to 2015. Within the TraCIM project, six European NMIs, including NPL and PTB, were tasked with developing a framework for the verification of mathematical software in the field of measurement. The framework was successfully applied to software implementing a number of calculations commonly implemented within coordinate measuring machines (CMMs), e.g., for fitting geometric elements such as spheres and cones to measured data.

The TraCIM approach is based upon the following aspects (all of which are explained in further detail below):

- The provision of specifications of computational aims that describe the mathematical calculations to be carried out.
- The generation of reference pairs and the development of performance metrics that can be used as part of a verification service.
- An Information and Communications Technology (ICT) infrastructure that allows communication, via the internet, between the software developer and the provider of a verification service.

Computational aims

Fundamental to the verification of a mathematical software component is a specification of its computational aim. The computational aim provides a complete and unambiguous description of the calculations to be undertaken by the software. The computational aim informs both the software developer and the software tester. Importantly, the computational aim should not contain any information or guidance regarding how the calculation should be implemented, such as the choice of algorithm. This choice is the concern only of the developer of the software who intends to implement the computational aim.

Within the TraCIM project, a procedure was developed that allows a computational aim to be stored as a Portable Document Format (PDF) file. The computational aim comprises information contained in the following fields: Language, Title, Keywords, Mathematical area, Dependencies, Input parameters (with subfields Symbol, Description, Type, Shape, and Constraints), Output parameters (with subfields as for Input parameters), Mathematical model, Signature, Properties, References, Notes, and History.

[1] Metrology is the science of measurement.

Additionally within the project, the “Computational Aims Database” [4] was developed that stores specifications of computational aims. The database was populated by TraCIM project partners with specifications of computational aims for a number of common measurement problems.

Reference pairs and performance metrics

A reference pair for a given computational aim comprises reference data (or reference inputs) and corresponding reference results (or reference outputs). Reference pairs are used as follows. Software under test is applied to reference data to generate test results. The test results are then compared, in an appropriate way, with the reference results allowing the performance of the software for that reference pair to be assessed. Repeating this process using a “large” number of reference pairs, typically chosen to span the space of inputs to which the software is intended to be applied, then allows an overall assessment of the performance of the software to be made. For each reference pair, one or more “performance metric”, i.e., a numerical measure of the performance of the software, is evaluated, e.g., the number of decimal digits of precision by which test and reference results differ (illustrated in Figure 1). Performance metrics for a large number of reference pairs are then combined to evaluate a “single figure of merit” (illustrated in Figure 2).

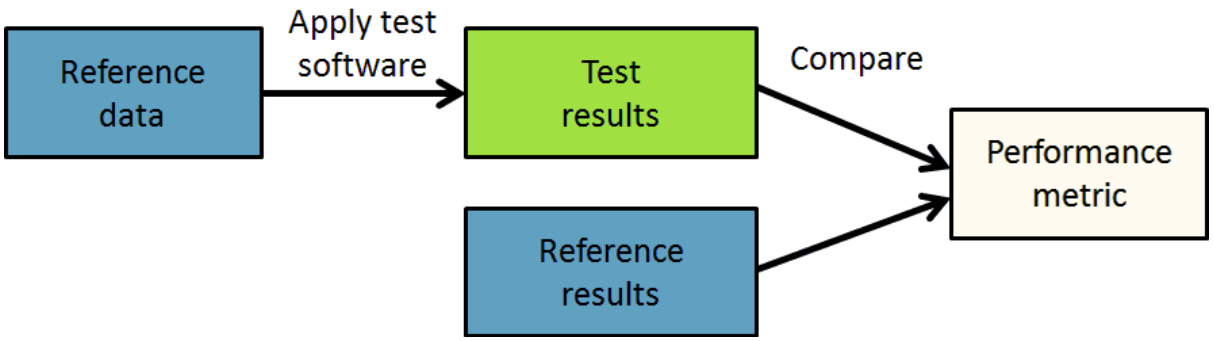

Figure 1: Assessing the performance of software using a single reference pair.

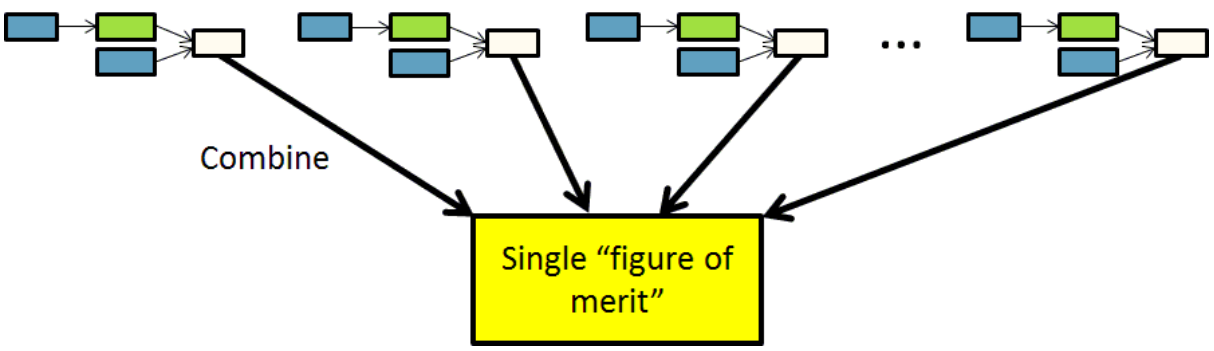

Figure 2: Assessing the performance of software using multiple reference pairs.

Methods for the generation of reference pairs can generally be classified as one of two types:

- "Forward data generation" involves calculating reference results corresponding to given reference data. Often, forward data generation is implemented using "reference software", e.g., software that has been used for many years and is considered to be of high pedigree.
- "Inverse data generation" involves determining reference data corresponding to given reference results. Generally, inverse data generation requires a detailed analysis of the computational aim to be undertaken.

ICT infrastructure

The "TraCIM system", the ICT infrastructure developed within the TraCIM project, allows communication between the provider of a verification service (referred to subsequently as "the service provider") and the user of that service ("the service user") using the internet. The TraCIM system comprises the following elements (illustrated in Figure 3):

- The "TraCIM server" – the core software module that manages all of the operating data and controls the flow of data to other modules. The TraCIM server is implemented in Java and is typically hosted by an NMI.
- The "TraCIM client" – a software module that allows the service user to communicate with the TraCIM server using the internet. The TraCIM client runs on the PC of the service user. It may be implemented in the language of choice of the service user, although an example TraCIM client is typically made available by the service provider.

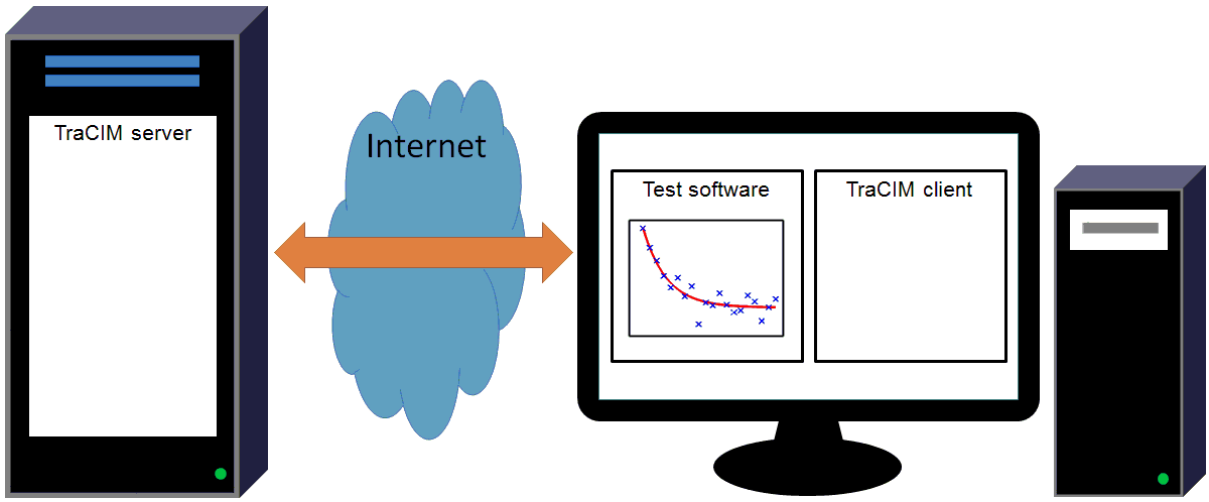

Figure 3: The elements of the TraCIM system.

Communication between the server user and service provider via the TraCIM client and TraCIM server takes place as follows:

1. The service user submits a request for reference data for a particular computational aim to the service provider.
2. The service provider supplies the service user with the required reference data.

3. The service user applies the software under test to the reference data and submits the test results to the service provider.
4. The service provider undertakes comparison of the test and reference results and supplies the service user with a software evaluation report.

In the final three steps, information is provided in eXtensible Markup Language (XML) format.

Advantages of the TraCIM approach

Methods previously used for the verification of mathematical software have often been quite ad hoc in nature. The TraCIM approach is more unified, being implemented by more than one European NMI. Other advantages include:

- The server-client aspect significantly reduces the requirement for human involvement in the verification process, increasing speed and efficiency.
- It makes use of the ability of modern software environments to communicate via the internet, again increasing the speed with which an order for a particular verification service can be completed.
- Verification services for new computational aims can easily be added.
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Clearly, from the point of view of the service user, the TraCIM client plays a key role. Two distinct types of TraCIM client exist:

- “Standalone” TraCIM clients – in some cases, the software environment within which the software under test is running is unable to connect directly to the TraCIM server. A TraCIM client that runs outside of that particular software environment, but within a software environment that does allow communication with the TraCIM server, must be used.
- “Integrated” TraCIM clients – in other cases, the software environment within which the software under test is running is able to connect directly to the TraCIM server. A TraCIM client may be implemented within that software environment.

Figure 3 shows the particular case of a standalone TraCIM client.

Both types of TraCIM client have advantages and disadvantages. An example standalone TraCIM client is typically provided as part of the TraCIM service, thereby removing the need for service users to develop their own. The necessary web communication is already implemented within the TraCIM client, meaning that service users do not need to implement this communication. However, the service user still has to extract the reference data from the XML file provided by the service provider so that the data can be processed in their chosen software environment. Following processing, the test results must be extracted from that environment and put into the XML format required for sending to the service provider. An integrated TraCIM client has the advantage of allowing the service user to work within one software environment. However, the service user will need to be, or become, familiar with XML tools and web communication within that environment. In an integrated TraCIM client, the activities of processing of reference data and communication with the TraCIM server, knowing the formats of the XML files, can be fully automated.

Current and future work

Although the TraCIM project was specifically concerned with the verification of mathematical software used within metrology, the TraCIM system developed during the project is equally applicable to mathematical software used in any field. The only requirement is that the reference pairs approach is appropriate for the verification. Indeed, a current follow-on project to the TraCIM project is concerned with demonstrating the use of the TraCIM system beyond metrology.

Having said that, the intention is for the TraCIM system to continue to be applied in a metrology context at NPL. It will be applied to software developed within the DSG and more widely within the laboratory. Additionally, the TraCIM system will be used to provide software verification services for developers of commercial software.

There are a number of questions that arise relating to the verification of mathematical software. For example:

- What is an appropriate number of reference pairs to use?
  The efficiency of the TraCIM approach helps to make the use of very large numbers (e.g., hundreds) of reference pairs more practical than before. However, one must take a pragmatic view and take into account that for some service users a key task, namely the processing of reference data, may require a significant amount of human interaction.

- Are more standards relating to the verification of mathematical software needed?
  Presently, for most computational aims, methods for the comparison of test and reference results, and the performance metrics used to assess the performance of software under test, are not well or uniquely defined. Interestingly, the decision taken within the TraCIM project to focus on a set of computations implemented by CMMs was partially driven by the availability of an ISO standard [5] concerned with verifying software for least squares fitting of geometric elements to measured data.

Acknowledgments

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For more information on the TraCIM approach, contact the authors at info.tracim@npl.co.uk.

Ian Smith *is a mathematician in the Data Science Group at the National Physical Laboratory. He had significant involvement in the TraCIM project, particularly relating to the generation of reference pairs, and is the coordinator of the ValTraC project, the follow-on project to TraCIM. He has 20 years of experience in the development, in a wide range of languages, of mathematical software, primarily for the analysis of measured data, and has undertaken verification of commercially available software for a number of third parties.*

Keith Lines *applies experience gained in over 25 years of working with NPL's scientists, administrators and support staff to help ensure that NPL activities in software development continue to meet the requirements of NPL's ISO 9001 and TickITplus certifications. The application of mathematical methods to software systems is also an interest. He is a member of the British Computer Society.*

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Test Maturity Assessments

Guidelines for Test Process Improvements

Sivaprasad Kunjanpillai, UST Global

Abstract

The systems and processes are the backbones of any IT organization in today's multifaceted delivery structure of test engagements, spaning across multiple locations, especially when it is a multi-vendor engagement. An exhaustive and sporadic inspection of the processes and delivery capabilities are necessary for Test/QA organizations to find out the maturity level of software testing and plan step by step improvement of the process to achieve the next level of maturity. These assessments will also help to adapt to continuous changes and increasing business complexity to ensure that the systems are relevant for business needs. There are several test process maturity assessment models available in the market, which will measure the effectiveness of an organization's test/QA process. The evaluation is normally performed by judging certain key areas of processes/operations using several checkpoints in different levels of maturity. This whitepaper is intended to detail practical guidelines to assess the test process maturity of an organization and to list down necessary guidelines to implement test process improvements.

1.0 Necessity of a Test Process Maturity Assessment

In the modern era of technological advancements, software systems turned out to be an essential catalyst for the economic and social evolution. Organisations across the globe are expected to increase their spending on software and services and as per the market studies, software spending is projected to be up 6 percent in 2016 and to grow another 7.2 percent in 2017 to a total of approximately $357 billion. Due to the increased demand for reliable and efficient software systems in all walks of life and the latest technological trends in the current market such as AI and advanced machine learning, Virtual and augmented reality, Digital twins, Conversational systems, are making the software development process extremely challenging. Any quality issues identified with such systems and processes may become calamitous and can result in huge financial losses. Over a period of many years, software engineering discipline has conducted many studies on the key factors which are directly influencing the quality, effectiveness and efficiency of the products under development and software testing has grown into an increasingly important phase of software development process. Though software testing has proven as effective in ensuring the quality aspects of products, the following facts have undeniably proven the necessity of a timely assessment of the maturity of software testing methodologies and processes.

Figure 1.0 – Test process Maturity Assessments

2.0 Test Process Maturity Assessments – When and What to Achieve

Test process maturity assessments can be introduced as part of an organization's effort to trigger business improvements by achieving industry recognized process accreditations such as ISO 9000:2000, Six Sigma etc. or as part of the overall software process improvements about achieving CMMI® or ITIL® standards. The test process maturity assessment should be performed to find out an organization's maturity level by judging certain key areas of processes/operations and to plan step by step improvement to achieve the next level of maturity. These assessments will also help the organizations to adapt to continuous changes and increasing business complexity to ensure that the software systems are relevant for business needs.

3.0 Test Process Maturity Assessment Models

The detail oriented test process maturity assessment and improvement models were created when the current software process improvement was not providing enough attention to the comprehensive software testing processes. There are a number of maturity assessment and improvement models currently available in the market, which are classified into various categories such as the one detailed below:

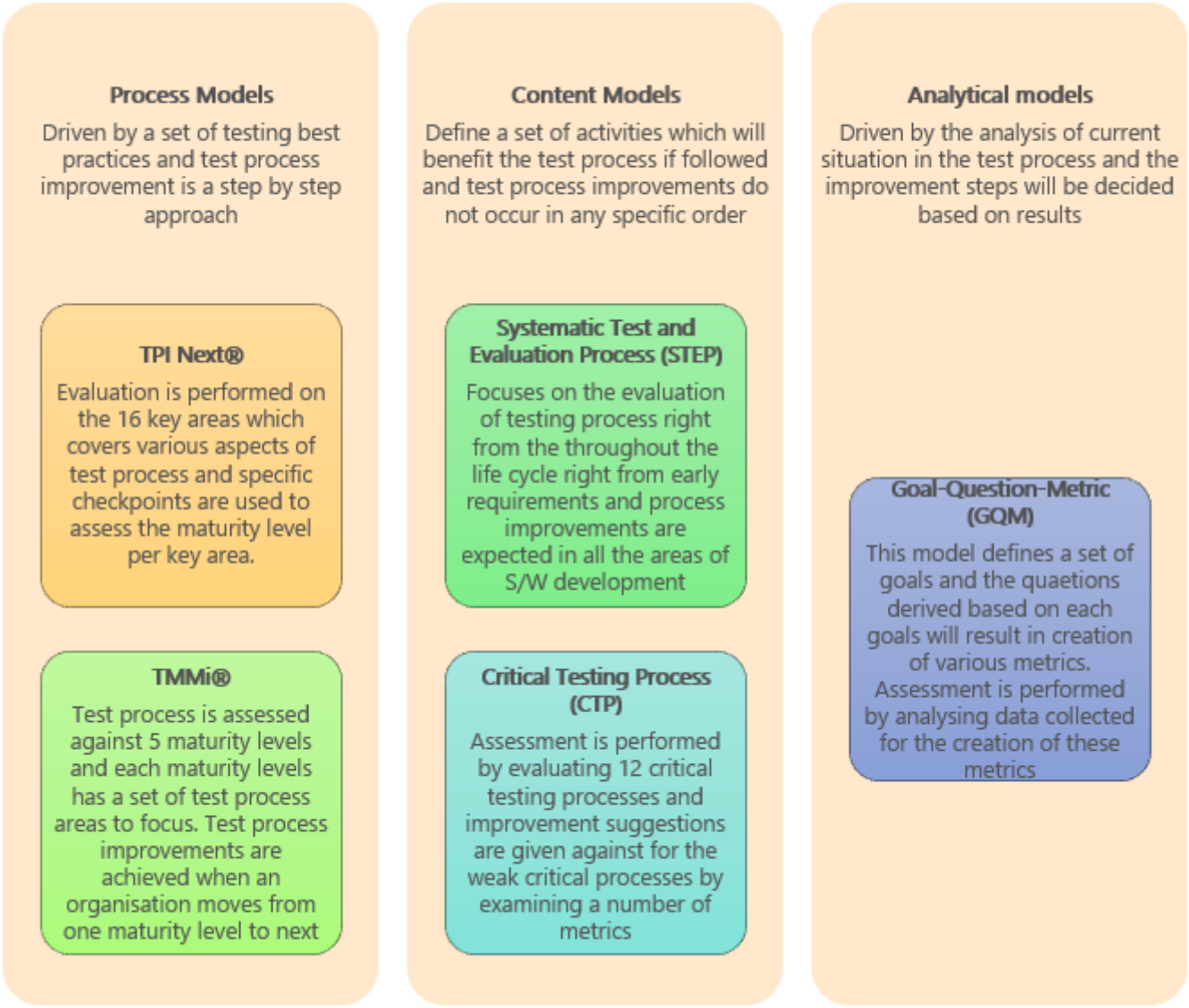

Figure 3.0 – Test process Maturity Models

Apart from the most popular assessment and improvement models detailed above, there are a lot of other maturity assessment models available which are generic or Hybrid in nature. Each maturity assessment and improvement models has its own merits and demerits based on the domain and software development platform on which the maturity assessments are done.

4.0 Test Process Maturity Assessment Models – What's next

The Technological advancement is happening at the speed of light, which creates a whole new era of opportunities that were never imagined a few years ago. New software development methodologies such as agile, lean development, test driven development, new platforms such as digital, cloud, changing technological trends such as IoT, AI and advanced machine learning, VR/AR etc. are reinforcing the need for an advanced software testing process as the newest technologies are often creating frequent testing challenges which were never before. Along with the process and approach changes in software testing industry, the test maturity assessment model should also undergo a significant change to effectively measure the efficiency of newly introduced processes and approaches. As the new approaches for testing latest technologies highly depend on test automation frameworks and tools which will enable the test environment virtualizations, stimulation of the volume of data loads required for testing etc. necessary changes in maturity assessment models should also be made to evaluate them effectually.

5.0 Generic Guidelines for Test Process Improvements

The process improvements of an organizations test process are dependent on results of a thorough evaluation performed using any of the assessment models specified in earlier sections. Following key aspects are a couple of generic guidelines, if followed, will result in significant improvements in the way currently testing is carried out in an organization:

5.1 A trained and certified workforce

- **Improved Skillset** - An organization's overall test process can be drastically improved by deploying a knowledgeable group of individuals. A thorough understanding of the testing process and right people skills will enable the team to engage in various testing activities with precision and result in better results.

- **Building Right Team** - A team with a right mixture of domain competencies, software testing knowledge, essential soft skills can change the way testing is currently performed in an organization.

- **Training and knowledge management** - Awareness sessions on testing processes, cross-functional training, knowledge management repositories, periodic training on software testing and soft skills, mentoring etc. are some of the key catalysts for establishing a successful group of individuals who are aimed performing the tests in a better way. Necessary testing and domain certifications will also be helpful to improve the overall understanding of the domain knowledge and testing competencies.

5.2 Introduction of right tools

- **Tools Implementation** - The introduction of right tools to the existing testing landscape can bring in various process improvements such as efficiency, effectiveness, and quality. A right test management tool introduced in a testing project will define certain standards for the test artefacts created and thus will result in overall quality improvements. Various data for analysis and reporting can

also be captured from the test management tools which can be used for the efficiency and effectiveness of the current testing process. As an example, a requirement static testing tool, if used at the early requirement analysis phase will result in overall quality improvements across various phases of software development.

5.3 Emphasis the pain areas in projects

During a testing project, several pain areas might come up, which will result in a poor-quality testing phase of the project and the overall product. Bad quality requirements, ambiguous designs, poorly maintained test environment, unplanned and unrestrained code deployments, bad test data etc. are often a couple of examples of pain areas in a normal test project. Even though most of the areas specified above are out of test team's control, a proactive measure from testing team can result in overall process improvements and better results

- **Requirements** – Involve test team right from the requirement analysis phase for static testing the project requirements and define meaningful acceptance criteria by working closely with the business team. The static testing of requirements can be adopted as a process improvement measure in future test engagements.

- **Design** – Perform a static testing of high level, low level, and detailed system and integration design documents will also add values to the overall project success.

- **Test Environments** – Process improvements should be introduced in defining the test environment requirements accurately and these test environmental considerations should be delivered to the environment management team on time. Creation of a test environment request form in consultation with environment management team will be helpful to mitigate several issues identified with test environment in later phases of the project.

- **Release Management Process** – A suitable release management process with clear communication plan on the code deployments and test environment downtime should be agreed with all the parties to mitigate the delays due to unplanned and unrestrained code deployments. A proper release note with unit test results should be made mandatory for all code deployments, which will help to avoid bad quality code delivered for testing.

- **Test Data** – Defining correct test data requirements and requesting the right amount of test data on time will be helpful to mitigate the possible issues related to data during testing. Creation of a test data management layer with the responsibility of testing the data before deploying them in the test environment can also adapt as a precautionary measure improve the quality.

5.4 Metrics collection, analysis, and test phase reviews

A collection of several metrics to assess the effectiveness, efficiency of the current testing process will be helpful to perform a detailed analysis of the current testing process. A list of metrics that can be collected for analysis and decision making to

improve the overall testing process is detailed below along with respective areas of improvements.

Review of the completed test phase, feedback collection, lessons learned meeting etc. will also be crucial to identify the gaps in current testing process and identify the areas of improvements to work out a plan. A new approach to testing and a shift in testing focus can be implemented as part of the continuous review mechanism which will result in a continuous improvement cycle.

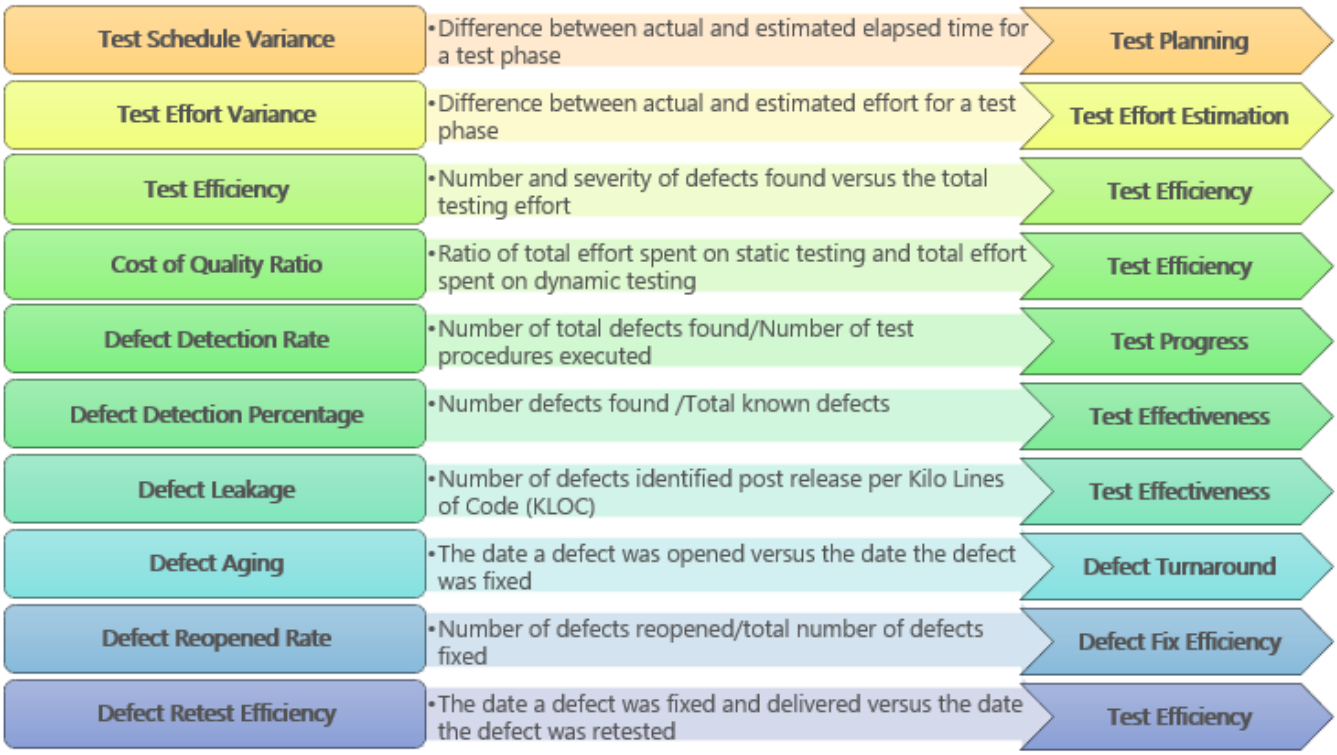

Figure 5.4 – Test process Metrics

Summary

All the general guidelines listed above can be used as the first level of an improvement plan for an organization's test process and this doesn't substitute the need of a model-based process improvement. To achieve a detailed and systematic improvement for the test process, an organization should undergo a research on maturity assessment based on the assessment models specified earlier and a customized process improvement approach and plan should be agreed.

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Sivaprasad Kunjanpillai *is a Test Consultant currently employed with UST Global with over 10 years' experience in quality assurance practice within retail, insurance, banking and financial services domain. During the tenure at UST Global, Siva has involved in process improvements and leading the quality assurance engagements at various market leaders in retail and insurance industry.*

Sivaprasad.Kunjanpillai@ust-global.com

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