Introduction

Delivering Quality at Speed for a Digital Enterprise

On the same day that millions of Britons cast their votes in the UK General Election, hoping for a bright future for the country – a number of QA, IT and business leaders assembled in the heart of London to discuss the future of testing and Quality Assurance.

The Cognizant Quality Engineering and Assurance Summit 2017 brought testing experts and thought leaders together to discuss and imagine a future where greater quality is achieved, faster than ever before.

The summit explored:

• How new technologies, such as artificial intelligence, could transform software development and testing – moving many businesses away from systems of record and engagement to new systems of intelligence.
• Alternative testing models and processes, such as cross-functional QA teams, combining DevOps and Agile approaches, and the emergence of the quality engineer.
• New ways of thinking about failure and how to create a culture that rewards experimentation and risk – especially risk that leads to valuable new innovations.

The day featured detailed presentations on a range of topics, fantastic audience participation, and lively Q&A sessions that talked about the future of Quality Engineering and Assurance.

While voters all around the country collectively nudged the UK into the future with their ballots, the attendees of the Cognizant Quality Engineering and Assurance Summit 2017 gained new knowledge that will help them push their organisations towards the testing technologies and best practices of tomorrow.
As a Principal Analyst at Forrester, Diego Lo Giudice has spent years researching customer behaviours and needs, and writing about the Age of the Customer: our current climate where businesses must become customer-obsessed in order to build competitive advantage and avoid disruption.

In the last few years, the Age of the Customer has changed though, presenting even greater challenges to enterprises – in both B2C and B2B.

Today’s customers are far more willing to experiment with new technologies, are far more savvy and informed, and expect to see a seamless, connected experience across both the physical and digital worlds.

Meeting these growing demands is putting organisations under increasing pressure. To respond to this, some organisations are changing their very core – their DNA as Diego describes it – to stay focused on the customer.

To do this, leading companies are changing:

• From customer-focused to customer-led: The most successful organisations don’t just know what the customer wants now; they know what the customer will want in the future.
• From data-rich to insight-driven: Having large data stores is no longer enough. Leaders must use AI and analytics to get ahead.
• From silos to integration: CIOs must integrate with the rest of the C-suite, and tear down departmental walls to deliver the experiences customers want.
• From perfect to fast: Organisations need to operate and release faster to satisfy changing and increasing customer demands.

Across his research, Diego finds organisations tend to struggle with one of these shifts in particular.

From perfect, to fast. Organisations across all the industries are struggling to satisfy the customer’s demand for speed.

For Quality Assurance professionals in particular, this change will always present a balancing act between Quality and Speed. To achieve a reasonable balance between the two, it’s essential for QA engineers and developers to treat DevOps and Agile as two sides of the same coin – employing both to maximum effect.

Automation can also play a key role in accelerating QA cycles, removing redundant efforts and inefficiencies. Similarly, to allow teams to work at different speeds without having to build the same stubs over and over, service virtualisation will become a key part of the QA process.

The final, and arguably most important piece of delivering Quality at Speed is Artificial Intelligence. AI is fast becoming the future of QA, enabling businesses to test smarter, test customer experience without human intervention, predict possible failures ahead of time, and significantly reduce mean time to repair.
Encouraging Failure and Eliminating Bias

Sam Hills and Tony Fish offer their perspectives on the strategic direction of testing.

Doing things a little differently with the cloud

Sam Hills, Chief Architect for Cloud Services discussed how his organisation uses cloud technology to meet the changing expectations of modern retail customers.

The rise of social media and mobile connectivity has completely changed the way people shop, making it much easier to switch instantly between retailers. In this fiercely competitive world, retailers must be able to make changes faster than ever, or risk falling behind.

Ultimately, this means the speed of software releases is more important than quality – which is why the cloud is fundamental to software development and testing. With cloud technology, organisations can access the infrastructure and platforms they need at the time, rather than having to build capabilities from the scratch within their own data centres.

The importance of failure

Tony Fish, a tech evangelist, entrepreneur and co-founder of Fab Lab London, spoke about the need to identify and remove hidden biases to make testing more accurate and effective.

Whether we like it or not, we are all algorithms. We all exhibit pattern-based behaviour that can be recorded and analysed – and predicted. As QA professionals, this assumption is at the heart of our work. The services we create only work because people are predictable.

The trouble is, many of our algorithms are based on biased models and opinions, which can get in the way of effective testing. Cognitive bias research has shown most biases implicit and unconscious, often founded in the environment we grew up in or the places where we live and work. But biases can also be swung by temporary factors, such as moods, food or stress.

The key thing to remember is these biases are present in QA teams and within the multiple data sets used for testing. For example, people from different cultures will code the same algorithm in different ways and testers may change that algorithm because of their own cultural biases.

Tony also wonders if automation and AI could actually be hiding more biases, left within the software by the people who developed and tested it.

These unconscious biases impact everything we do and real improvement in testing will only be possible when we fully understand the role of cognitive bias in the process.
From Testing to Quality Engineering

Heads of Test CoE at Boots and Principal QA Engineer at ASOS.com elaborate how their brands have transformed QA for the digital age.

New testing needs new skills, processes and tools

When Myron Kirk, Head of Test CoE at Boots, began his career in testing, it was a very different world. Specialist tools were used by isolated, independent teams, and they were all managed under the waterfall model.

Today, Agile and DevOps rule the roost, and help teams develop software faster – and for a much wider array of devices. The question remains then for testing professionals, in a world where many organisations deploy hundreds of releases in a day, how can testing keep up?

To work at this new pace, Myron suggests a series of paradigm shifts that test leaders need to consider.

The paradigm shifts of modern testing

The first change involves shifting left. By testing early, more functional, unit and integration tests can be conducted in less time. And by bringing testing into the picture earlier, it can be better integrated into the entire development process.

The next shift is to bring in new people. That doesn’t necessarily mean replacing the testing workforce, but it involves a cultural change in how we think about test professionals – and the skills they need. The testers of the future will certainly need to be cross-functional, understanding the coding and business sides – as well as the traditional skills that testing demands.

New processes will also be needed. To further encourage cross-skilling and flexibility, it can start with something as simple as co-locating testers with other development and business teams. Beyond promoting collaboration, the next step in process transformation is to embrace automation. The final consideration is to find new tools that can help increase testing velocity. Yes, you may need to integrate new coding and testing solutions, but it’s also important to maintain a single view of quality, sitting above any new and existing platforms you use.

By looking at new innovations in your processes, training, and solutions, it’s possible to accelerate testing, without compromising on quality.

Born Digital

Jitesh Halai, Principal QA Engineer at ASOS.com tells a similar story of speed vs. quality, but from the perspective a company that was born digital.

Starting as an online business, ASOS.com has nurtured its digital community to create a broad and active social media following over the years. Because of this, however, the brand risks quickly annoying its social followers if its site, app or other systems go down.

With that kind of pressure, can you risk accelerating testing and QA?

To balance speed and quality, and increase velocity without risking reputation, Jitesh discussed the strategies he and his team use to empower testers.

Empowering teams

The first step to empowering test engineers is to let them choose the tools they want to use. Yes, you can try forcing them to use the platforms you’ve standardised on, but this leads to more training time and costs in the long term – and potentially less engineer motivation.

Whatever technologies you provide for your engineers, you need to ensure they are also fast and agile. This might involve re-platforming,
and making further use of cloud and IaaS solutions, but the increased agility you achieve is worth the effort. Jitesh also adopts a different approach to culture, and urges QA leaders to do the same. With VR and AI on the rise, it’s difficult for anyone to predict exactly what skills QA professionals will require in the future. With this in mind, it’s essential to hire people who can adapt to changing market, technology and business conditions.

Similarly, it’s important to create a team with cross-functional skills to ensure you can respond to any changes in the industry. Testers must be able to handle elements of support, business analysis, and also some coding of their own. Likewise, business analysts, QA and developers all need to be able to speak the same language to ensure collaboration, efficiency and speed are optimised.

The Psychology of Persuasion

Nathalie Nahai, web psychologist and author of Webs of Influence, reveals how organisations can apply lessons from psychology to create engaging and compelling customer experiences.

Five psychological principles for increasing online engagement

Best-selling author Nathalie Nahai also consults with businesses about how to bring scientific rigour to the way they build customer experiences. By applying five key psychological principles to online behaviour, it’s possible to improve customer engagement and conversion rates.

1: Endowed progress
When people are provided with an advancement towards a goal, they are much more likely to want to achieve that goal – this is the principle of endowed progress.
For example, when shown a progress bar that’s 15% complete before the customer has taken any action, people are more likely to complete the process. By incentivising customers with endowed progress, conversion rates can increase significantly, but it’s important to remember to keep the gaps between task checkpoints as small as possible to improve engagement.

2: The sunk cost fallacy
Typically, people have a tendency to continue actions they’ve already invested in. We’re reluctant to discontinue an activity that we’ve sunk money, time or energy into.
If companies can engage customers with endowed progress, they can then keep them engaged with the “sunk cost fallacy” to encourage interactions. On social platforms, this principle is also connected to social proof, where continuing with an activity encourages the customer’s broader network to also continue or engage in that activity.

3: The appointment dynamic
One technique for encouraging customers to
come back to your brand is to offer them a reward for checking in at a specific time and place. This approach, called the appointment dynamic, can help create a pattern of habitual use of your product or service.

4: Cognitive load reduction
Even the most intelligent people have limited capacity for cognitive processing, so it’s essential to lower the mental effort required for customers to complete actions.

Amazon’s one-click checkout is a good example of cognitive load reduction, making it almost effortless to complete a purchase, as well as reducing the perceived pain of parting with money.

Simple ways to implement cognitive load reduction in your online experiences include:
• Reducing the number of actions you demand of customers.
• Splitting complex processes into single steps.
• Dividing web pages into boxes to reduce visual clutter.

5: Dopamine loops
When our bodies create dopamine, it triggers pleasure-seeking behaviour, which is something that successful app developers rely on to encourage habitual use.

By offering constant access to a steady stream of small rewards, these platforms can create dopamine loops – cycles of seeking tiny rewards. Because the rewards are so small, they never trigger the opioid system that suppresses dopamine, so the user continues to seek the next reward.

The ethics of persuasion

Of course, when using any of these principles to influence customer behaviour, it’s important to bear in mind the ethics of the situation.

Most organisations use these techniques to persuade through facilitation – making a great product or service even more enjoyable for customers. Occasionally, however, brands can drift into the territory of persuasion by coercion, manipulating people to get a desired outcome for the business, but potentially damaging the perception of the brand.
Getting to Grips with AI

Euan Davis and Karthik Murugesan of Cognizant examine the strategic and technological implications of artificial intelligence.

What’s next for AI strategy?

Euan Davis’ talk begins with a simple question: could you be replaced by AI? Many in the creative or strategic side of business would think the answer is a simple no. But with tools available that can analyse, recreate and even score writing styles on a range of criteria, it’s clear that AI could be used to automate a huge range of processes commonly seen as the sole reserve of humanity.

Further examples paint a clear picture of a complex future enhanced by AI:

- Deep Knowledge Ventures, a Hong Kong firm, is one of the first companies to place an algorithm on the board of directors which is responsible for making key decisions at the C-suite level.
- On the streets of Dubai, robot officers have been deployed. Using facial recognition software, they can analyse and identify drivers in real-time, handing out tickets.

These are just specific, and very advanced examples of what AI can do. The full extent of machine learning is yet to unravel itself, and for now, AI merely remains a narrow tool rather than the way of life it could become.

AI: the systems, tech and QA perspective

While we understand what the future might hold from a strategic perspective, what does AI mean for the future of our systems, tech and QA?

Karthik Murugesan explains that it represents a shift from our existing systems of record and systems of engagement to a new system of intelligence. This shift presents a huge change from the systems we rely on today.

Today, much of our technology, systems and processes are based on predictable outcomes. Even our innovations rely on that predictability. Take a big success story such as Uber; for all its innovation and disruption, it merely automates the predictable processes used to hire a taxi. Some, such as Netflix, are moving into automating the unpredictable human element. Netflix uses a range of data and user feedback to attempt to recommend movies and TV shows to its users, a complex, unpredictable response that’s much more in keeping with how AI will be used in the future.

For QA professionals, it’s important to be aware of these shifts into systems that tackle the unpredictable. Today we focus on testing systems of engagement – tomorrow it will be M2M communications and AI-powered robots.
Special keynote

Innovation in the Age of the Digital Enterprise

Dan Cobley shares the seven strategies Google used to continue innovating – even as it grew.

A front-row seat to disruption

Having headed up Google's UK operations in the past, and been involved in a range of digital startups, Dan Cobley has had a front-row seat to digital disruption.

All the change Dan has seen has been driven by two key forces: cloud connectivity and ubiquitous mobile access. Google has capitalised on these changes to go from strength to strength, and Dan shared the seven key strategies Google used to continue innovating successfully as it grew.

Seven steps to digital innovation

1. Have a clear mission
   No one ever got out of bed excited about helping a business make X widgets in a month. Google began with two people in a garage hoping to organise the world’s information, and make it more accessible. Similarly, Facebook’s mantra has always been to make the world more open and connected.

   These are the kind of ambitious, exciting goals that motivate teams to deliver bright new ideas.

2. Give people real autonomy
   Engineers and developers need freedom in order to experiment and innovate. Dan offers the example of Google StreetView. It began with one engineer borrowing a friend’s car and a digital camera to develop the first StreetView prototype. People need time to try sometimes risky experiments like this. That’s why Google began using its famous 20% rule: Staff are given 20% of their time to use on any projects they like.

3. Embrace learning through failure
   Thomas Watson Sr. the founder of IBM, famously said “the fastest way to succeed is to double your failure rate.”

   It’s essential to accept that failure is a by-product of innovation, but only if you can recycle what you learn from each failure.

   Understanding that failure was acceptable, a 23-year-old marketing executive at Google took the risk of sending an Android phone into space. The video it captured went on to be viewed millions of times, and proved to the business community that Android was a dependable operating system they could rely on for business applications. He could only take that risk in a culture that accepted – and even embraced – failure.

4. Use data, kill the hippo
   Traditionally, ad links show up as a shade of blue in Google search. Google wanted to try a new shade of blue to promote better engagement with these ads.

Dan Cobley
Former MD - Google UK & Ireland | Entrepreneur, Tech Investor | Managing Partner - Blenheim Chalcot
Some organisations would leave the decision of what colour to use up to the hippo: the highest paid person in the room. Often though, that person is the furthest away from the customer – and least likely to make the right decision on what a customer wants.

Instead Google used data to inform its choice. It found purple-tinted blues were more popular – a change that generated an extra $200 million in ad revenue. All thanks to data.

5. Be terrifyingly open
To help people innovate, you need to give them context. If they only have narrow, personal KPIs to work towards, they will only deliver narrow innovation.

Google held regular Friday presentations detailing financial performance, upcoming launches, and other important business updates. This created an exchange of trust between company and staff, and helped give employees the wider business context that would help fuel their creativity.

6. Cannibalise yourself
Businesses are afraid to cannibalise operations and move into lower margin areas. Sometimes though, that’s the only way to thrive in the long term.

Blockbuster is a great example of this. It had a chance to acquire Netflix in the past, but refused due to the high margins it enjoyed in its retail business. As the rise of streaming services caused retail rental to decline, however, Blockbuster would go on to regret that decision.

When the iPhone launched, Google had a solid ad-driven desktop business. But it was clear things were going mobile. Google could have tried to stall the change and avoid moving into the lower-margin mobile ad business. Instead, it decided to embrace the change and go mobile-first, investing in mobile apps and Android.

7. Innovate 10x
To maximise innovation, Dan suggests organisations spend 70% of their time on core business, 20% on adjacent activities, and 10% on something completely different altogether.

That number becomes important, as Google refers to this kind of innovation as a 10x project – a project designed to improve productivity by 10 times. To increase efficiency by such a high order of magnitude, you often need to completely start from scratch – promoting innovation.

Google developed its XLabs to focus on this kind of 10x project, and deliver the innovative Google products and services we enjoy today.