



# Testing-as-a-Service

The Logical Next Step for Application  
Performance Testing

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## 1. EXECUTIVE SUMMARY

Over the past 4-5 years, increasing numbers of applications, and in particular web-based applications, have moved outside of the data centre to be hosted by countless external organisations. During this same period, the performance expectations of customers have risen sharply. A recent Forrester<sup>1</sup> report found that:

- **Customers become impatient when pages take longer than 2 seconds to load;**
- **Poor site performance leads increasingly to shopper dissatisfaction and site abandonment;**
- **The consequences for online retailers with underperforming sites are lost sales, and the impact reaches beyond the Web;**
- **Mobile is a nascent but emerging shopping channel and performance is key to customer adoption.**

At the same time, customers expect richer content and features on e-commerce sites such as bandwidth-clogging video; zoom; look-ahead field completion; and animated content. Performance testing is consequently becoming not just a nice to have luxury, but an essential insurance policy to protect the investments made in key customer facing applications. And these investments are not just the obvious new application launches; they are increasingly more mundane investments such as:

- **Changes to the underlying IT infrastructure;**
- **Maintenance fixes to operating systems and database systems;**
- **New releases of your application for functional or regulatory purposes.**

With ever tighter timescales in which to deploy all this change, the testing function needs to step up to a new level of maturity whereby it:

- **Can respond quickly to emerging business needs;**
- **Utilises automation so that the tests are accurate and replicable;**
- **Compares results against the agreed customer experience profile and benchmarks.**

**The Trust IV blucap™** service utilises the commercially proven performance testing tools to provide customers with a rapid turn round service capable of recreating and testing the customer transaction process for a number of simultaneous users that is to all intents and purposes unlimited – the critical factor that can seriously impact the performance of the application.

The service has been designed by IT testing experts based on extensive hands-on experience working for some of the UK's leading companies. Using a simple pay-per-use pricing model blucap™ enables developer project managers to schedule end-to-end tests of the application; which will stretch both the application and its underlying infrastructure.

<sup>1</sup> eCommerce Web Site Performance Today. Forrester Consulting Aug 2009

The key benefits of **blucap™**, the service based performance testing solution from Trust IV, are:

- **Speed of deployment, typical engagements can be turned around in a matter of weeks;**
- **Price is not only very competitive, the use of Test Tokens ensures you can tightly manage your testing budget, featuring transparent reporting on test spend by project;**
- **Tests the application from the end-user perspective, and across the whole of the user journey, not just simple navigation to the homepage;**
- **Expertise of the people creating the user journeys, don't be fooled by people who say you can do this yourself with minimal expertise, that just creates bad benchmarks;**
- **Test scripts and assets held for future tests can also be used to monitor your application post-live to assure your customers of a good experience;**
- **Personalised results portal enabling ease of sharing results.**

This white paper discusses the changing face of performance testing, looks at the benefits of testing as a service and the limitations of some of the approaches people are investing in, and presents the practical benefits of using blucap™ as your testing service.

## 2. FUNCTIONAL AND PERFORMANCE EXPECTATIONS

In order to attract more customers and to give them an engaging experience whilst accessing their website, many organisations are investing in a variety of techniques and content:

- **Search engine optimisation to capture customers**
- **Ad-words to meet specific search requests**
- **Dynamic content and personalised content**
- **Flash and video content, including live video in some cases**
- **Integration with numerous web service providers for specific content services**
- **News, blog and social network feeds**

All this content has an impact on the complexity of the application and the infrastructure needed to support it. This increased complexity means the application is rarely in the same state for very long before a change is made either to content or to the code or to the infrastructure underlying it. Software and security updates get applied daily, any one of which could create a performance bottleneck, resulting in poor page load times on the customer's desktop.

Page load time is extremely important for today's online customer, with 2 seconds for a page to render being the limit for 47% of online shoppers. Speed also breeds loyalty, a scarce commodity in the online retailing world with 52% of online shoppers saying that quick page loading is important to their site loyalty according to Forrester. Dissatisfaction was attributed to a number of things, with the top two being:

- **23% due to the web site being too slow or taking too long to render**
- **17% due to site crashes or error messages**

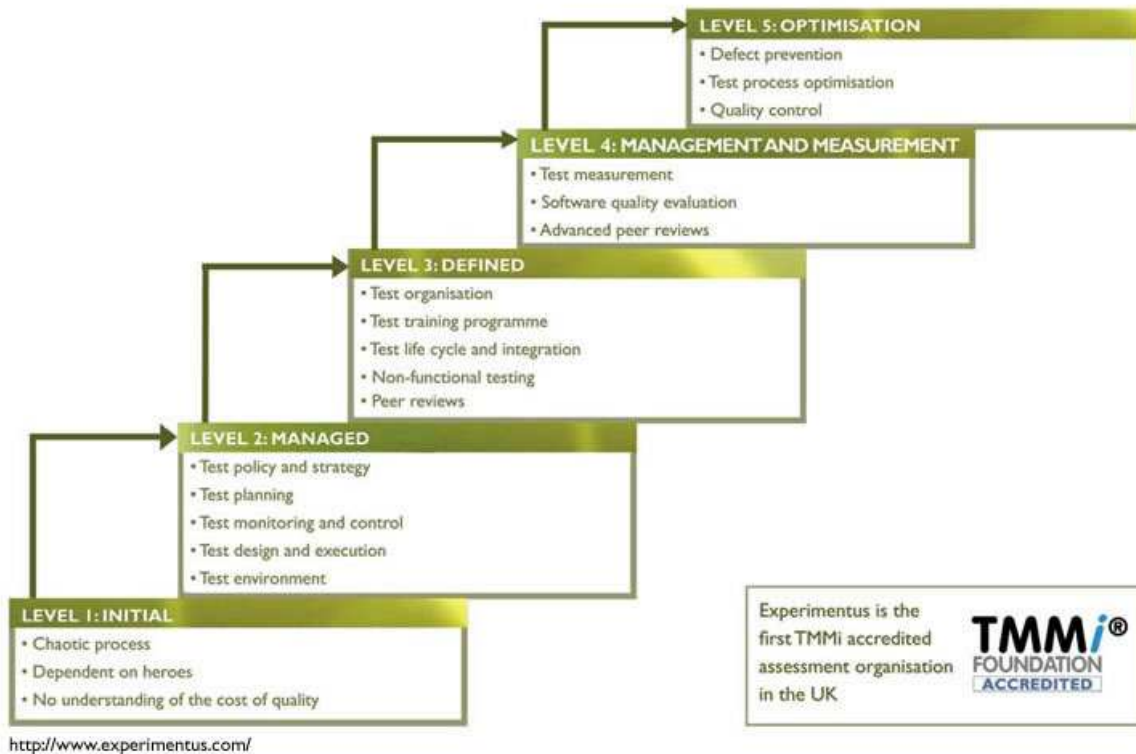
Forrester go on to say that "seventy-nine percent of online shoppers who experience a dissatisfying visit are likely to no longer buy from that site. Also, 46% of dissatisfied online shoppers are more likely to develop a negative perception of the company, and 44% will tell their friends and family about the experience. With 87% of customers shopping in both online and retail channels, the impact of a bad online experience reaches beyond the Web".

This background to current customer performance expectations needs to be treated very seriously, especially with the trend towards the use of mobile browsing devices such as smart phones and netbooks. Increasing numbers of customers have shopped via mobile devices, with a high proportion (27%) of them reporting that it is dissatisfying due to the mobile shopping experience being too slow.

**"...seventy-nine percent of online shoppers who experience a dissatisfying visit are likely to no longer buy from that site..."**

### 3. THE EVOLVING PERFORMANCE TESTING IMPERATIVE

Testing in general is evolving and becoming more disciplined as can be seen by the increasing influence of the Testing Maturity Model (TMMi). The application of the TMMi model to software quality tends to focus on functionality and meeting of the specification, with maturity of non-functional characteristics like performance lagging somewhat behind the curve.



Experimentus, one of the leading organisations involved in the TMMi foundation, offer a free TMMi survey through their website, whereby you can assess where you sit on the testing maturity curve. If you want to see how your organisation performs, visit <http://experimentus.com/>, the results are often quite a surprise.

The science behind testing is often misunderstood, resulting in a simplistic test approach that generates results with dubious value. Testing is a statistical process requiring discipline to ensure test results that can be used to forecast live performance with any degree of accuracy or certainty. Commonplace examples of bad science include:

- **Not using a “live-like” test environment**
- **Using too small a sub-set of test data or test users**
- **Extrapolating results in a straight line**
- **Using record and playback tools without enhancing the resulting scripts**
- **Assuming a single test run will be sufficient**
- **Not running tests for long enough for volume issues to surface**
- **Not measuring from the end-user perspective**
- **Taking internal data centre measures as proxy for end-user experience**
- **Assuming network is same for all end-users**

## 4. PERFORMANCE TESTING APPROACHES

A number of strategies are available to tackle the performance testing aspects of application deployment:

- **Do nothing**
- **Acquire an open source tool and get developers to do as final phase**
- **Buy a commercial tool and build a specialist team**
- **Outsource, most likely to an offshore provider**
- **Testing as a service**

Whilst the “Do Nothing” strategy has its place, usually for low risk applications, it is not a recommended strategy for any customer facing application where customer experience is important. The zero cost is more than offset by the risk of downstream issues, the impact on the company’s image, and the abdication of control.

Open source solutions offer a cheap entrance to performance testing, and will reduce the risk and cost of failure. The issue with open source is the levels of maintenance that is required of the scripts, coupled with the difficulty of retaining the necessary skills in-house to continue to operate the tools in the future.

	Solution Cost	Risk to Service	Cost Impact	Loss of Control	OVERALL
Do Nothing	•	●	●	●	●
Open Source	•	●	●	●	●
Special Team	●	•	•	•	●
Outsource	●	•	•	•	●
Test Service	•	•	•	•	•

Undoubtedly the best way to reduce the cost and risk of live performance issues is to invest in one of the commercially available tools, and to build a specialist team around the use of the tool. This approach ensures full control of the testing cycle, but the cost of software, servers and staff makes it something that is the preserve of the largest organisations. Even with this approach, it is often necessary to top-up resources with subject matter experts who can tackle the more difficult application nuances.

Outsourcing the performance testing to one of the specialist outsourcers, if done correctly, will have a similar risk and impact profile to an in-house team. From a cost perspective, you would expect the overall costs to be lower, but experience suggests that outsourcers tend to over-resource their projects and require a significant amount of “service management” by the customer themselves. Overall this is a similar profile to the in-house team, but with a slight loss of control.

The concept of testing as a service strikes a balance between all the above approaches. It is only used when it is needed, so no need for expensive licenses, servers and staff to be retained. The costs are very competitive, which when coupled with the improvement in risk and cost of performance issues, is comparable to the outsourced model. Since the solution itself normally sits outside the computing environment of the organisation, it is able to truly reflect the experience a customer would have in accessing and using the application. In some circumstances it may be desirable to have the service implemented internally, which is also an option.

## 5. THE NEXT STEP FOR APPLICATION PERFORMANCE TESTING

Application performance testing needs to address the current application development landscape where a variety of factors are influencing the chosen strategy; rapid development methods, coupled with the brisk pace of change, require any testing solution to be able to be deployed quickly and to deliver results within a short period of time.

“...rapid development methods, coupled with the brisk pace of change, require any testing solution to be able to be deployed quickly and to deliver results within a short period of time.”

In recent past, day rates for testing have attracted a lot of attention, with offshore seeming very attractive based on the headline rate and the volume of testers available. The efficiency of such approaches is now starting to be questioned as offshore differentials start to be eroded, and experience shows that the day rate alone doesn't guarantee the desired outcome of quality assured software.

Many organisations have satisfied themselves with monitoring various facets of their IT infrastructure as a proxy for availability and performance of their applications. This misses two key areas of the end-to-end experience: the internal complexity of the application; and the influence of the wide area network that connects to the end-user. Frequently we see all the data centre statistics showing all is well, whilst a simple manual attempt to process an end-to-end transaction is clearly taking many times longer to execute than it ought to.

Connections to, and efficiency of design of, the database layer are a common culprit, limiting the number of connections in a way that is not visible to the data centre monitors. Equally, the seemingly cheap application availability monitors, only test that a page is delivered, they don't then try to follow a logical user transaction path, so the measures are really quite superficial. The only real way to ensure the end-user experience is to test from their perspective, and to process complete user transactions.

Application testing generally, and automated testing specifically, requires an eye for detail and an understanding of what constitutes a valid test and a significant result. Headline grabbing test solutions that purport to enable users with minimal testing expertise to create tests and interpret results are taking a big risk. Simple things like not having sufficient data or users to test against, can adversely influence test results because the data may be held in cache, and repeated tests simply appear to have very predictable response times after the initial pass. Equally, not parameterising your tests to include a degree of “randomness” to the selections users make from returned lists and options will not replicate the actions of users who scan all items and pages returned in their user journey. Clearly, knowing how to account for such variations is an acquired skill.

Finally, once test scripts, data and results are created, it is imperative to manage these important assets for future use:

- **Test scripts need to be secured so that they can be used with future releases and where possible with ongoing monitoring solutions**
- **Test data must be secured to ensure that future tests are made on a similar basis to the original test. Just taking the current live data doesn't guarantee the existence of necessary test cases, nor is it very secure from a data protection perspective. Test data management can be a whole discipline in itself**
- **Test results must be archived and catalogued. When new releases are tested, what will be the benchmark that they are compared to? Where is this stored, who has access to it are key questions to consider**

## **6. CONCLUSION**

Customer demands and expectations are driving web application functionality at an ever increasing pace, application development tools are also developing apace, as is the use of web services and hosted servers. In order to assure the customer experience, performance testing is becoming increasingly important, and the traditional use of testing teams is struggling to keep pace with demand.

The next logical step is to move to a performance testing solution that is able to respond to demand, be quick and easy to access, is priced to compete with offshore models whilst still delivering good science from a statistical perspective. Performance testing as a service is emerging as the solution, and **blucap™** from **Trust IV** is specifically designed to meet these evolving testing requirements.

## ABOUT THE AUTHOR



Paul Caine is Managing Director of Trust IV Ltd and has over 25 years experience in software testing.

Trust IV is an independent and specialised provider of IT testing services and IT project services. Trust IV work with customer's in-house teams, deploying proven methodologies, to achieve the highest levels of quality in software.

Established in 2005, Trust IV brought together like minded individuals who have a passion for automated testing. The people who work in Trust IV have many years experience across the IT arena including testing; infrastructure; development; and project management. This blend of experience enables Trust IV to see beyond the normal boundaries of testing organisations when it comes to strategy; planning; design; execution and analysis of tests.

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