

Testing Solutions Group (TSG) assists HMRC/Capgemini pioneer a new Assurance and Test Strategy

Following Capgemini's successful win of the HMRC account, Capgemini inherited the ongoing delivery of a number of major programmes and projects which were in flight at the point of transition of services to Capgemini in July 2004. New Tax Credits (NTC) was one of those major programmes and was in a period of significant recovery following early implementation problems associated with software product quality.

One of Capgemini's immediate priorities following transition was to improve software product quality and predictability of delivery outcomes. An approach was required that overcame pre-existing "audit fatigue" within the team, but adopted a challenging, but joint approach to developing and implementing change. A partner was required to provide some level of independence to the assessment, as well as industry credibility to complement the wealth of experience and ideas from within Capgemini.

Why NTC decided to adopt the strategy

NTC has blazed a trail as a vigorous and successful early adopter of the new Assurance and Test Strategy. Capgemini's Programme Manager, Darren Cheese, shares his views on the benefits reaped and lessons learned so far.

The NTC Programme decided in late 2004 to review its existing product assurance and testing strategy. The task was approached by employing the services of independent industry expertise, namely, Isabel Evans and Neil Thompson of Testing Solutions Group (TSG). The initial review was produced in Q1 2005, identifying gaps between existing practices and a best practice scenario. A variety of improvements based on these findings have been built into a revised strategy for future NTC major releases.

The decision to adopt the new strategy was in response to the volume and criticality of live service incidents considered excessive by both HMRC and Capgemini. Although there was an expectation of increased cost in the short term to implement and embed the changed strategy, future cost savings and productivity benefits are expected in both Solutions Delivery and Live Services through:

- more effective and efficient use of test resources through a solid risk-based strategy;
- more effective and efficient detection and resolution of defects; and hence,
- a better and more predictable quality of product released into Live, delivering more accurate business outcomes and thus incurring lower service penalties.

In other words, the principal driver for implementing this change in NTC was predictability of outcome and commercial/reputational exposure post-release, which was considered even more important than productivity of delivery of change.

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How NTC went about it

The new test strategy was formally introduced starting with Release 7 which was implemented in November 2005 [although a small number of tactical adjustments had already been applied to the later test activities in Release 6 in June 2005] A phased approach rather than a “big bang” approach was adopted which meant that for Release 7, NTC effected only the highest priority changes, those likely to produce quick wins or enable a basis for future changes.

The changes NTC put in place

The major changes introduced included:

- simplification and improved visibility of test stages;
- better planning, transparency and measurement of testing activities and progress;
- earlier involvement of test experts in the lifecycle, in particular the appointment of Requirements Test Authorities;
- improvements in risk-based approach to product assurance and testing;
- improved test design and traceability of tests to risk management;
- involvement of a broader range of staff in cross-team reviews, together with risk-focussed use of review roles and review meetings;
- enhanced understanding and use of test techniques;
- earlier dynamic testing in the lifecycle (e.g. moving some of the old Functional Integration Tests to be under the control of Development to quicken turnaround, while retaining the benefits of an independent test team and increasing the focus on specific interaction-based tests (Component Integration Testing));
- enhanced system testing against business requirements (Change Requests) and business processes; and,
- other changes to team structures and cross-team working practices.

Key to the success was full engagement of HMRC through the design and implementation of the changes. Capgemini and TSG worked with HMRC to ensure that the new assurance and test strategy provided clarity on what support was required from HMRC during the test lifecycle and how client assurance activities and business process/product testing could be integrated into the lifecycle

What the changes have meant to NTC

Release 7 went live successfully in November 2005 and proved to be the smoothest NTC major implementation to date. Work on metrics and lessons learned is still progressing, but as regards benefits to HMRC and Capgemini respectively, the following encouraging observations were made:

Process improvements

- Enhanced planning has contributed to increased visibility of progress through testing activities and ability to adapt.

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- The value of the new stage Component Integration Testing is acknowledged as a higher coverage is being observed from relatively fewer tests than under the old strategy, and defect detection rates appear relatively high.
- Founding a separate team for InterSystem Integration Test (the small-scale part) has improved that stage's focus and ability to plan ahead.
- Enhanced Management Information graphs as part of the metrics packs are increasing confidence in product quality earlier in the lifecycle, and help NTC to fine-tune resources towards critical functions and other high-priority tests.

People Improvements

- Beginning with an intensive series of workshops to explain the new test strategy and its benefits, development and test staff at all levels have been encouraged to give feedback and contribute ideas. This is providing improved clarity and understanding of individual and cross-team roles across the lifecycle.
- Test Managers, Team Leaders and Requirements Test Authorities are beginning to spontaneously suggest improvements which build on the initial foundations, contributing their own imagination and detailed knowledge of the NTC system and processes, and thereby building motivation. For example, Test Analysis Workshops have already been introduced for future releases, based on initiative from key individuals.
- A thought-through series of test automation enhancements is underway, further enhancing motivation among staff.

Lessons learned

1. Don't underestimate the effort involved...

The costs associated with implementing the new test strategy have been greater than originally estimated. The Gap Analysis between pre-existing and best practices highlighted a greater scale of change than expected, resulting in more testing effort than had been used in previous releases. The Programme Test Authority role required specific extra change enablement resource, which NTC chose to be in the areas of test techniques mentoring, reviews process management and test automation (and which was co-ordinated with the Capgemini Strategy roll-out team).

2. Implement change of this scale and importance in phased approach...

A phased approach to the implementation of key strategic delivery changes provided a risk-managed approach enabling greater likelihood of success in the long term and the ability to constantly measure the benefits of the change and adapt ongoing change plans accordingly.

3. The pain is worth the gain...

The "bottom line" is that NTC R7 has been a smooth implementation, and the new test strategy has been acknowledged at very senior levels as a key contributor to that success. One example of a very positive message emerging from originally negative perceptions:

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The increased time spent on review iterations is strongly believed to be an investment in increased quality, in that the enhanced reviews have exposed acknowledged defects which would otherwise have languished undetected leading to more costly rework, or worse, live failures later.

Testing Solutions Group (TSG) role in assisting NTC

The criticality of the NTC programme meant that a decision was made to engage with acknowledged industry experts in advance of the Capgemini wide review and improvement programme. TSG principal consultant and acknowledged testing expert, Isabel Evans, led the assignment and quickly identified changes to the existing approach to testing with NTC. Isabel also worked closely with the Capgemini team to ensure that any new approaches would be aligned to the wider Assurance and Test Strategy. As the Test Strategy for NTC Release 7 was defined, it was clear that further expert support would be required to ensure its implementation. Whilst Capgemini were able to provide some of this from its own resources, the demands from other programmes, plus the specific skills required for short term implementation, meant that TSG were asked to provide additional expertise. Over the course of 2005, TSG supplied a number of consultants to help implement the strategy in the following roles

- Test Authority
- Workshops
- Training, Coaching and Mentoring

In particular, TSG provided support for the introduction of a more formal review process plus more use of test techniques by developers and testers.

Acknowledged industry expert and TSG Associate, Neil Thompson, was engaged as overall NTC Test Authority and led the considerable task of implementing the Strategy during 2005. The success of this is now starting to be demonstrated through smoother and higher quality product implementations. Neil later moved on to the wider implementation of the Assurance and Testing Strategy across Capgemini's HMRC account. Having successfully 'trailblazed' the approach Neil plus other TSG consultants who assisted in the implementation support roles above, were ideally placed to help Capgemini and their other larger-scale consultancy and resourcing partners with the enormous task ahead.

Meanwhile, the TSG core competency of training, coaching and mentoring plus high-level strategic advice is being further exploited in the next stage of the implementation process. Customised workshops are being prepared and a blend of instructor-led and web-based training is being adopted to ensure that the skills transfer process is successful.

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Capgemini's NTC Programme Manager, Darren Cheese says, "TSG were able to supply some of the acknowledged thought leaders and practical consultants in the field of software testing at a critical time in the NTC programme. Their help has not only had a considerable direct impact in helping achieve our goals of better productivity, better predictability and fewer live errors, but their impact has been felt much wider across the whole account. I was particularly pleased at the collaborative way in which TSG consultants worked together with Capgemini consultants and key HMRC staff to develop a solution tailored specifically for this particular environment. I am certain that their on-going support will lead to even further improvements over the coming years which will assist Capgemini and HMRC to continue to meet their goals." Following a successful pilot on NTC, the approach is being rolled out across the HMRC account with full support from HMRC and Capgemini executive management.

From a client perspective, Len Morris, Deputy CIO Information Management Solutions, views the new strategy as a prime example of collaborative work on common issues and sees the strategy as a proactive approach to continuous improvement in service delivery. "The ultimate client is of course the public. Any internal initiative which improves our service to the public must be given full support and commitment across the board", says Len.

Steve Thornley, Capgemini's Solution Delivery Director, endorsed the strategy indicating his conviction that, "the strategy is going to significantly improve product predictability, productivity, service to our client and consistency of practice." Steve asserted that, "the strategy is not just a testing strategy for the testing community. It is a joined up, improved, end-to-end process that involves everyone in Solutions Delivery and Live Services. It engages the client from the outset to the end of the lifecycle and is part of our overall Solutions Delivery strategy to industrialise our operations."

Andrew Levitt, Capgemini's Head of Live Services, sees the initiative as, "a means to establish greater predictability of performance in the live phase. In Live Services we welcome measures which will reduce the load of re-work in the live phase and improve our service to the client. Let's get it right first time".