

## Automated regression testing is this the key to IT Change Assurance?

### Test Management Summit 2008

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## Agenda

- Once upon a time.....
- Our findings and conclusions
- Workshop – what do you think?

## First though please can we have a show of hands on your role in the testing world?

- Test managers/leaders
- Test practitioners
- Development managers/leaders
- Project managers
- IT Operations

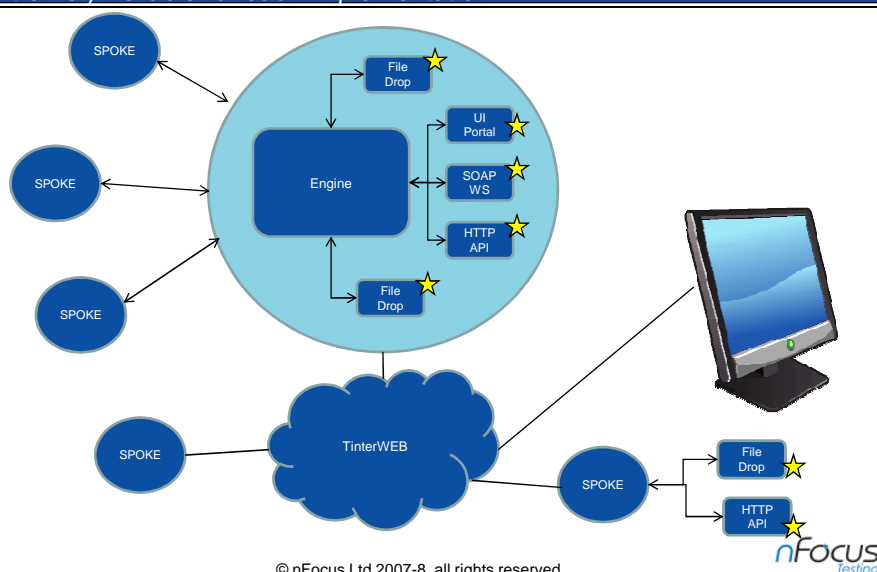
Now for the story.....

3

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Once upon a time we had the challenge of testing a complex routing and authentication service which connects the public to various organisation departments. The application was continually changing but had to remain extremely reliable for each implementation

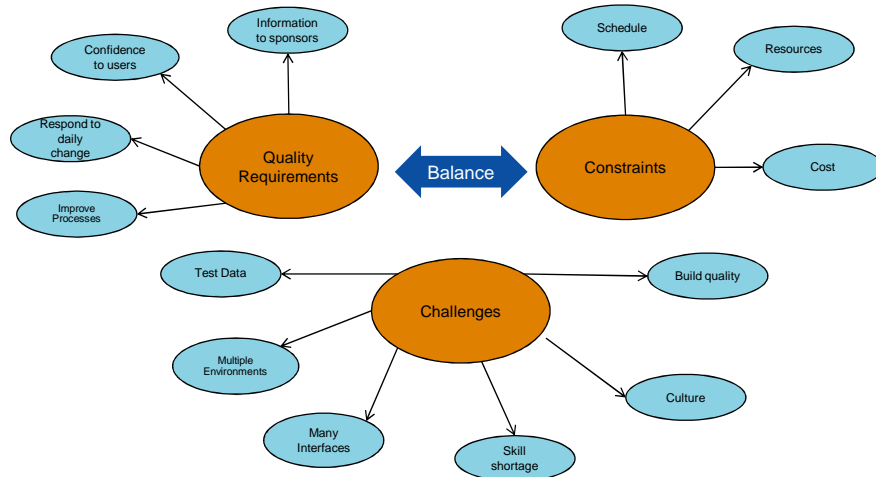


4

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The challenge was to deliver the quality requirements of the programme within the usual project constraints whilst resolving the various challenges associated with the developed solution.



A key point is to understand project requirements and constraints

5

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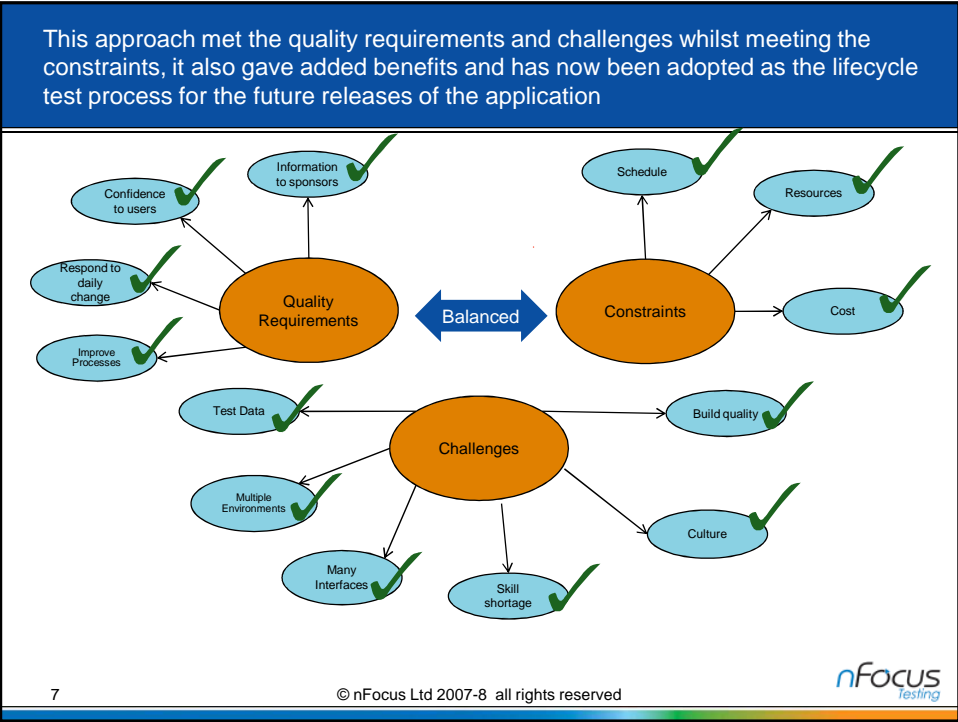
The defined test strategy was to write automated tests using frameworks to decouple the test assets from the test tools and harnesses. Successful tests were then rerun on every new build, or change, to check for induced errors. Status was reported daily to the team with a weekly summary to the sponsor .

- Deploy automation wherever possible
  - Use frameworks to decouple tool from the tests
  - Write harnesses where necessary
  - Base test data on production usage and define strategy for reuse
  - Classify tests into discrete re-runnable sets
- Execution
  - Execute smoke test subset on each new build in each environment
  - If OK then run the remainder of the tests
  - Reject build if anything but trivial errors detected
  - Run all tests every night
  - Run and debug new automated tests and raise defects
  - Report progress daily/weekly

6

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We managed to write automated tests to cover 80% of the function most of which are run each night. An average of 4 test personnel cope with an average 20% change per release. The test team achieved a significant productivity improvement

7000 Automated Tests cover 80% of the functionality

70% of these tests are run every night	10 hours to complete the run
20% change on each release on average	56 man years of testing over 10 months

4 people average

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Other benefits were realised including improved development process, more a consistent effective, efficient, scalable testing process and improved quality of test environments. Tests are also now being used to validate changes to the production infrastructure.

- Development
  - Developers see adverse side effects quickly
  - Pride in delivering a build that works first time
  - Project Manager saw improvement in the quality of deliverables
- Efficiency and effectiveness
  - Regression testing for free
  - Portable - runs on development, system test, production support giving high confidence at each level of implementation
- Test Environments
  - Forced consistent predictable baseline test environments.
  - Quick pipe cleaning of test environments
- Operations
  - Can be used in production to verify changes (e.g. quick fixes, infrastructure etc)

**We began to see this was more than just testing we were assuring change as well as debugging software**

9

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## Conclusions

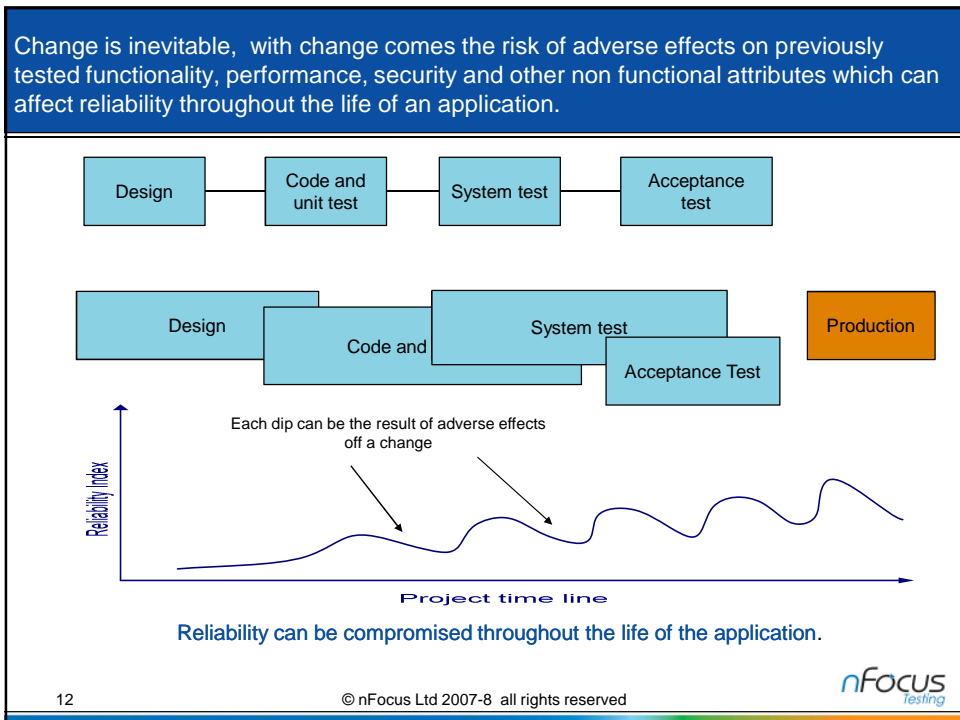
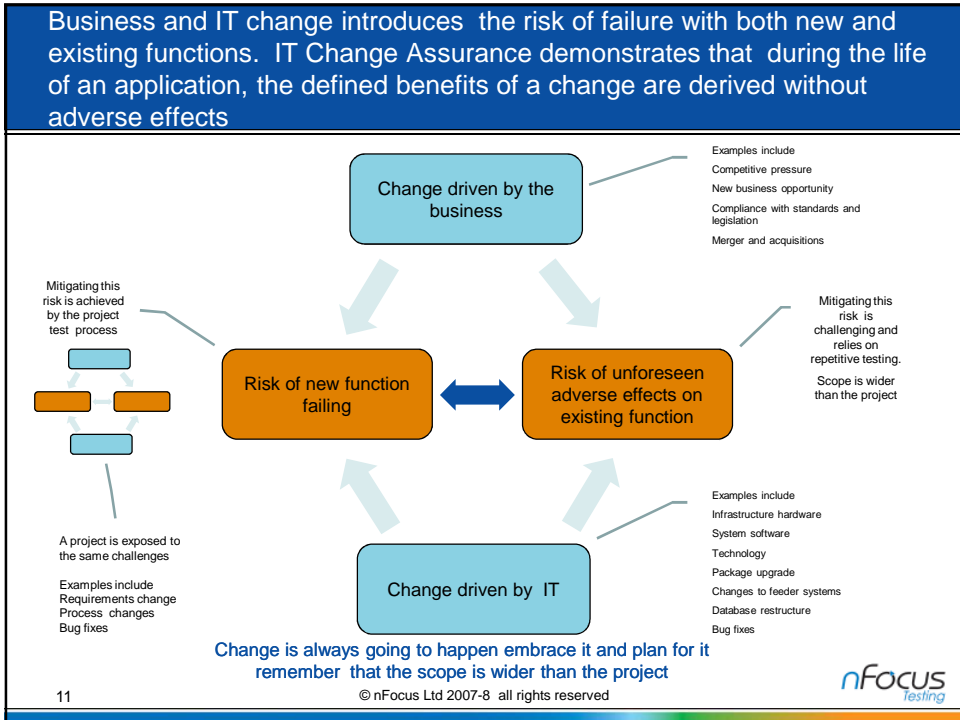
- Iteratively running an incremental set of regression tests minimised the risk of introducing errors
- Problem resolution costs are reduced by finding errors early
- Use of appropriate automation tools and processes enables iterative regression testing.
- Running subset of test daily improves confidence that the reliability of the software was being maintained
- Regression testing became the driver to the whole solution test process with the tests becoming part of the product and subject to acceptance criteria

**So what does this tell us .....**

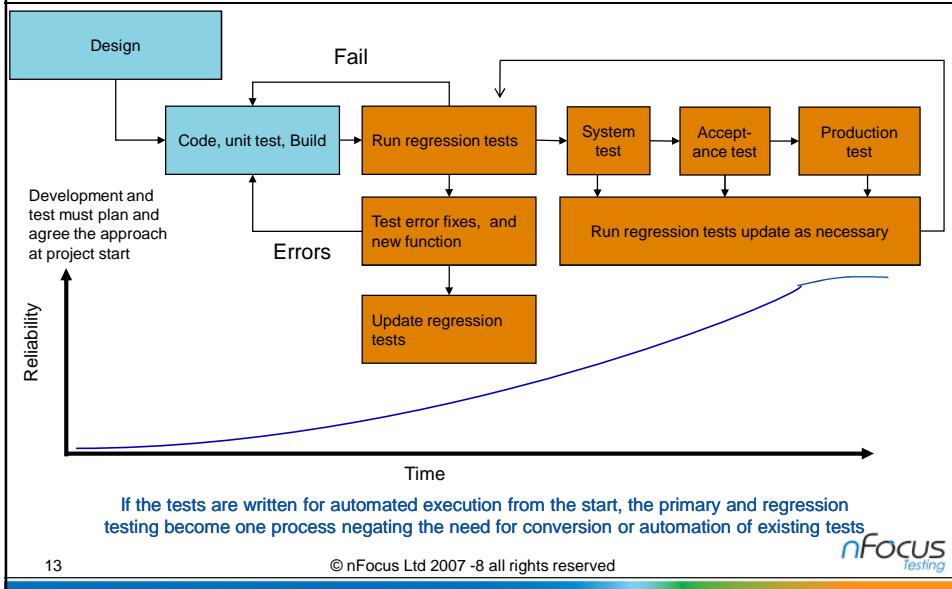
10

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Incremental development of the tests with constant rerunning of the test set increases confidence that the tested function remains intact and shows immediately if there are any adverse effects. Automation and an agreed test strategy are key success factors and can also give significant gains in productivity.

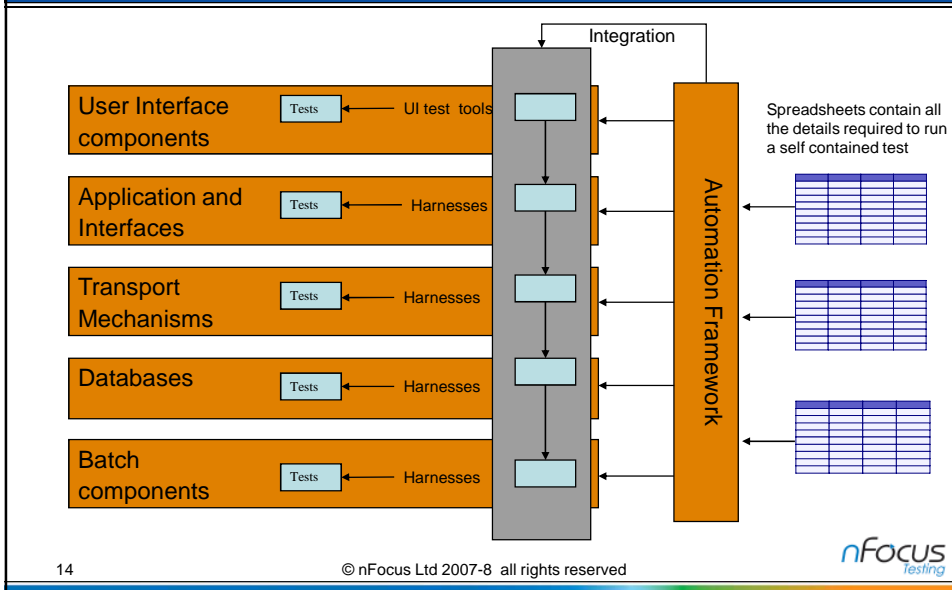


13

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Continual rerunning of the tests manually may not be sustainable. However automated solutions solve the problem at a component level. If the tests can be developed in layers then testing can begin with the first delivery even though there may not be a working application.



14

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Another key to successful IT Change Assurance is to understand what worries the stakeholders and select regression tests accordingly. The stakeholders must decide how much is enough and that will depend on information supplied by the test manager.

I don't want our advertising revenue compromised. Please no more security exposures and I want see every test rerun twice (unreasonable!)

A performance glitch will hit my call centre stats

This is how much I can do with what I am given. We need to make some choices and look at alternatives.

Will that new failover procedure hit the order system?

Changes to the widget handler keep breaking the print system

15

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IT Change Assurance is now our primary strategy. By employing automation to enable iterative incremental testing over the life-cycle of the application we deliver a high value effective efficient flexible test process fully supported by the stakeholders.

- Automation
  - Frameworks
  - Tests written as automated tests
- Iterative and incremental
  - Decoupled execution from preparation
- Lifecycle
  - Primary
  - Regression
  - Production
- Value is visible
  - Efficiency primary and regression merged
  - Effective runs frequently
  - Flexible runs in all environment
  - Gives confidence to stakeholders and development
- Embraced by stakeholders.....
  - Business
  - Development
  - Operations

Delivers value throughout the **WHOLE** life of an application

16

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In conclusion we believe that automated regression testing is the key to IT Change Assurance. It gives confidence that reliability has not been compromised by changes to the application, its supporting functions or infrastructure and must be an integral part of the application lifecycle.

- Automated regression testing enables:
  - Ability to show confidence that changes have had no adverse effects
  - Reduced risk of failure after change
  - Supply of information for informed decisions
- Not a silver bullet
  - Needs careful thought, some things cannot be automated
  - Needs investment and innovative thought to integrate into the process
  - Must have cooperation between the stakeholders, development and production support

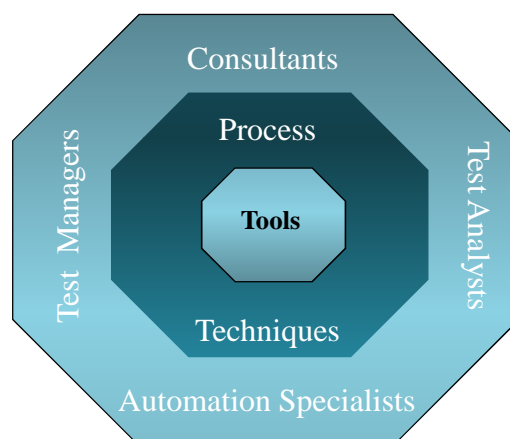
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17

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## Questions?



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## Workshop - for your views on the applicability of this approach in your organisation

- First a vote
- Automated regression testing is this the key to IT Change Assurance?
  - Agree
  - Neutral
  - Disagree

19

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Workshop - discuss the concept of IT Change Assurance and the challenges and limitations of applying the associated automated iterative testing approach in your organisation.

### Brainstorm

- Plus point
- Minus Point
- Interesting fact

### Consider

- Value to the business
- People
- Process
- Technology
- Infrastructure
- Delivery

20

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# Workshop

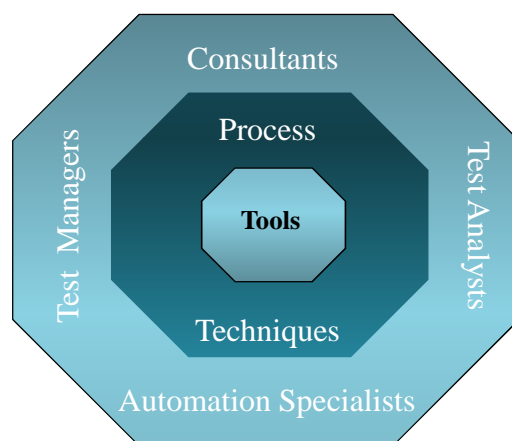
Summarise  
Wrap up  
Evaluation

21

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22

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