

Verification and Validation Processes

Test Management

Ian Hirst

Agenda

- **Review**
- **Software quality problems**
- **Modern software systems characteristics**
- **The case for systematic testing**
- **The principal testing activities**
- **Testing problems**
- **Getting the testing scope right**
- **Getting the test plan right**
- **Providing a value-add testing service**

Software Quality Problems

Many software projects fail to meet objectives:

- **16 % of software projects expected to finish on time and budget**
- **large projects complete with only 42% of originally proposed functions**
- **53% of projects estimated to cost 190% of the original estimates**

There is intense pressure to deliver:

- **first to market**
- **cheapest bid wins**

Testing strategy driven by schedule, not quality requirements

Inadequate time allocated for integration testing

Software Quality Problems

- **Software integrated into built environment without being tested**
- **Inadequate trouble report analysis conducted**
- **Integration test problems can take years to correct**
- **Lack of objective quality evidence is common....**



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Modern Software Characteristics

- **Large, complex and expensive distributed processing / multi-tier systems are common**
- **Lack of a single end-to-end solution development owner**
- **Variability of component maturity and quality**
- **Variability of supplier capability and workmanship**
- **Significant component interface and integration problems**
- **Large user populations, and large numbers of concurrent users**
- **Unpredictable user loads which are often driven by uncontrollable circumstances**
- **Enterprise wide implementation of software systems creates critical business dependency on systems availability**

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The Case for Systematic Testing

- **Complete testing is usually not possible**
- **A complex solution requires a significant test management effort and a complex set of testing activities**
- **Shortened time to market cycles > pressures on time available for testing**
- **A well planned (and justified) program of testing has more credibility and is more likely to be supported**
- **It enables consistency of execution, information creation and distribution**
- **It helps to sustain system quality despite changes to components & products....**

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Planning

- **scope, approach, resources, budget, documentation set, roles & responsibilities, schedule**

Preparation

- **test documents, tools, environments, training**

Execution

- **developers, systems integrators, users, external specialists, Independent V&V agents**

Reporting

- **informal, formal, automated**
- **defects, progress, resource usage, issues & risks....**

- **Quality not a key project success factor**
- **Test scope wrong**
- **Test priorities wrong**
- **Test budget wrong or inadequate**
- **Test schedule wrong or compressed**
- **Test skills and experience wrong**
- **Test documentation wrong**
- **Information exchange not good enough**
- **Loss of focus on solution objectives and end user measures of success....**

Testing challenges

- **Reaching agreement on test plans**
- **Getting test designs and cases documented**
- **Formalising joint planning**
- **Resolving resource / environment conflicts**
- **Coordinating & managing tests schedules**
- **Tracking & reporting test status / progress**
- **Time required to develop test designs**
- **Time required to develop automated test tool scripts**
- **Balancing schedule, cost and quality objectives**
- **Getting the paperwork completed....**

Getting Scope & Approach Right

- **Communicate with all the stakeholders**
- **Think outcomes, not activity**
- **Focus on user needs – all of them**
- **Build a comprehensive test WBS**
- **Think systems, not just software ‘logic’**
- **Prioritise testing according to risk**
- **Include end-to-end testing**
- **Include retesting after defect correction**
- **Include post installation verification testing**
- **Monitor project & testing progress and respond....**

Getting ready to write the test plan

- **Understand the project success factors**
- **Understand the solution – product elements & relationships / PBS**
- **Understand the build / implementation plan**
- **Define the test objectives**
 - ▶ verification of design, build and installation
 - ▶ support of tuning and configuration optimisation
 - ▶ evaluation of associated processes and documents
- **Determine the complete testing effort – Work Breakdown Structure (WBS)**
 - ▶ planning, design, preparation, execution, reporting & managing
- **Create a detailed budget....**

Building the test plan:

- **Identify what is in scope and out of scope**
- **List the test focus areas (F,R,U,E,M,P)**
- **Explain the test execution strategy**
- **Allocate roles and responsibilities**
- **Outline the testing schedule**
- **Identify test resource requirements**
- **List assumptions, issues and risks**

Approving the test plan

- **Have appropriate stakeholders authorise / sign the plan....**

Value-added Testing Service

- **Be part of the project bid / project initiation team**
- **Obtain clear solution success / acceptance / quality criteria to enable identification of test focus areas**
- **Identify & evaluate risks and create a testing strategy which helps to manage them**
- **Produce a professional and defensible Test WBS**
- **Be appropriately independent**
- **Act as a support service not an authority figure**
- **Keep testing team and and 'customers' informed**
- **Be involved across the project lifecycle....**

Review

- **Many software projects fail to meet objectives.**
- **Lack of objective quality evidence is common.**
- **A complex solution requires significant test planning and management effort and a complex set of testing activities.**
- **Testing providers and managers have to be involved and *value-adding* throughout the project lifecycle.**
- **Testing should be focused on assisting with evaluation of the success of the project and the 'quality' of the delivered solution.**