

**An Executive
Guide to Managing
IT Costs**

2003

White Paper



The Corporate Standard for Information Management

Executive Summary

This report provides a guide for executives faced with understanding the management of IT within their organisation. It explores the key issues that push up costs and increase risks from a business management perspective, rather than a detailed technical analysis. Common practice is reviewed along with key areas of high cost or high frequency problems. The report provides a range of case information to demonstrate the effects of poor control, and the benefits achievable from applying accepted best practice. This report finds that the 'best practice' approach adds value to IT and other business assets by:

- Defining business process and IT performance
- Improving user satisfaction and productivity
- Increasing internal and external security
- Reducing and managing business and IT risk
- Reducing and managing IT development, operation, training, and maintenance costs

Given today's increased pressure on business to control and reduce costs, an ever-increasing reliance on IT for both back and front office, and pressing security issues, the quality and cost effectiveness of IT is becoming paramount to business success.

“ 80% of IT projects fail to meet business function, schedule or budget objectives ”

British Computer Society Special Interest Group in Software Testing

Despite this alarming statistic it has become apparent that some organisations are significantly more successful in achieving their IT business goals than others. Over recent years a practical and efficient approach has been repeatedly used in a wide range of organisations for developing and maintaining both large and small IT projects. A key feature to the success of the approach has been the commitment and support of board level management, providing top down leadership.

- *In 1990 the Bank of England implemented a QA/test management system that delivered the business function, to schedule, at a 33% reduced budget*
- *The Bank expected further savings of over 25% on subsequent projects*

A Waste of Money?

A study has found that only 8% of total IT spending actually delivers value.

“Frustrated executives have long chafed at the difficulties of working out just how much their companies benefit - if at all - from costly IT investments...

PA [Consulting] also found that only 40% of executives polled in Europe, the US and Asia-Pacific had confidence in the business cases used to justify their companies' IT investments.

"We are seeing some backwash from the internet boom - there's a flight to certainty," says Alisdair Milne, head of IT consulting for the UK and Ireland at Cap Gemini Ernst & Young.

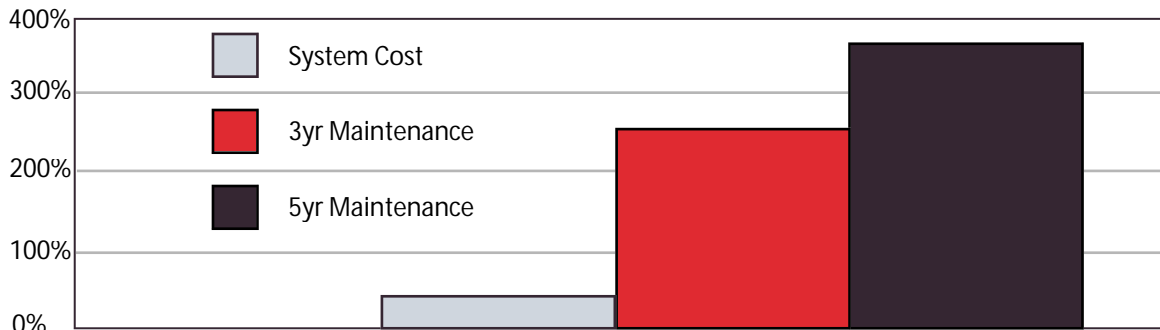
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Financial Times, October 26th, 2001

The FT report goes on to state:

- 75% of IT spending is on maintaining systems and infrastructures
- Leaving 25% for application development
- Of which only a third (around 8% of total spend) actually delivers value

If we assume a reasonably short 'useful' life for these investments in systems as three to five years:



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Are organisations sustainable when spending between 9 to 15 times the original cost over the life of the "asset"?

The British Computer Society and several international institutes have established research, analysis and publishing services broadly addressing the area of software quality, of which 'Managing Cost' is a core subject. The findings of these reports show that some 80% of software application development projects fail to meet budget, schedule and business objectives.

The FT report on the PA Consulting survey stated that around a third of IT development spending delivered value. Whereas the BCS and others, using an alternate set of measures, calculate one fifth of IT projects successfully meet business budget, schedule and function objectives.

Does this mean between 67% and 80% of IT development spend is waste?

Business and Technical Change

It is widely accepted within academia and the software testing and quality assurance industry that software development projects are subject to change. However, budgets and business plans are rarely designed to accommodate change, frequently making budget and/or schedule immovable.

Change can be driven by intrinsic factors within the organisation, such as new or improved procedures, or extrinsic factors from outside the organisation, such as improvements brought about by new technology or change required by regulation. The practice of not accommodating change is inflexible and necessitates a variety of 'quick-fix' approaches, such as:

- Scaling back the specification
- Cutting activities considered non-essential - usually including quality control and testing
- Postponing areas of development into phases that are intended to allow business targets to be achieved.

At best this approach results in additional maintenance and upgrade costs, as scaled back features are added back into the application via upgrades. This leads to additional training costs, as personnel must be trained on each new release, causing efficiency to suffer and creating indirect costs. At worst this approach results in complete business failure as the first release proves to be unstable, requiring increased effort to source problems and implement 'patches' to correct the faults - which often introduces new errors - while fatally damaging the internal (staff, suppliers, peers) and external (shareholders, customers, regulators) reputation of management and the organisation.

“ The driver for change was unusual. In May 1990 a City of London messenger carrying £291.9 million in certificates of deposit and treasury bills was mugged and relieved of his documents. The bonds were recovered, but the Bank of England decided electronic transfer was a more effective method of settlement. The CMMO project was devised and QA/testing was crucial as it was expected to settle all transactions in a market worth £80 billion per day. ”

Bank of England, Case Study, 1990

The online world is with us and there are lessons to be learnt from its troubled birth. The demise of all but a few of the heavily promoted and branded 'new economy' internet companies has been due largely to inefficient IT that:

- Failed to scale up to meet demand
- Failed to maintain reliability
- Or simply failed to perform any transactions

If this level of change and cost overrun is so widely known, surely it is time to factor change cost provisions into budgets?

Schedules

Independent research published by specialist research organisations confirm that over 50% of development projects that submit to such surveys overrun by about a third, contributing significantly to increased resources and therefore increased cost of development.

Business schedules share some responsibility. The 'time to market' argument is a strong one and almost impossible to counter for the middle managers frequently charged with system delivery. The pressures on schedule are similar to those on budget, with notable exceptions to the rule:

It is more common for budget goals to be increased, sometimes radically, than it is for business schedules to be extended.

This is partially due to the underlying assumption that if schedules are extended, budgets must be increased. If the schedule is considered critical to achieve a strategic or lucrative business advantage, there is a strong argument to do everything to ensure the schedule is achieved. This translates to more resource and therefore increased costs.

In order to meet business schedules, applications and systems are frequently released in 'least secure' form, putting the onus of testing and quality control on the end users. With many companies now opening their systems to the public via the internet, the resulting 'glitches' can have catastrophic impacts on new or established businesses.

Understanding the cost of fault or failure in order to achieve business schedules is critical to understanding the cost of IT to the business as a whole.

According to professional estimators, such as David Garmus who serves on the board of directors of the International Function Point User Group (IFPUG), once an organisation has established a formal estimating process; "estimates derived from the requirements specification can reasonably expect accuracy levels of $\pm 50\%$."

Mr Garmus further states; "Accurately estimating a project deliverable is a management task that many project managers feel ill equipped to perform effectively." He recommends an effective estimating process, supported by the appropriate tools, to achieve accurate estimates of software deliverables, allowing the project manager to:

- Produce a reasonably accurate estimate of effort required and completion date
- Set expectations and raise the level of awareness for project team and users of potential risks and outcomes
- Identify intermediate milestones, in order that problems can be found and corrected early
- Assess the impact of likely risks on project schedules

According to Mr Garmus, organisations that adopt formal estimating processes and supporting tool sets can reasonably expect accuracy levels of $\pm 10\%$ after detailed design.

Due to the variables and unpredictable influences on projects, Mr Garmus is a strong advocate of automated and information management tools; "Using an automated tool to deal with these variables offers several advantages: the tool can quickly and more accurately manipulate and calculate the contributing performance variables, rapidly perform 'what-if' scenarios, and make use of industry databases."

Maintenance & Upgrades

Some say Y2K was mostly hype due to the lack of failures and faults post Millennium. Others say the spend, of USD\$ billions worldwide, avoided major failures. Either way, the lack of verifiable maintenance information for systems across all industries meant no one could be sure. The argument between the optimists and pessimists proved one thing: Y2K showed significant IT and information assets, including client data, were exposed to immeasurable levels of risk due to ineffective, inaccurate or non-existent management information.

Y2K provides a stark example of what can happen if systems/software is not built in a manner that facilitates efficient maintenance.

It is widely accepted in the software industry that faults found early are less costly to correct. The amount of saving can vary considerably, however, the accepted average is 80%. That means fixing faults or making changes early in the development process will cost around 20% of what they would have cost, say after implementation.

A computer fault can often go undetected for considerable periods, compounding the business impact of the error until manifesting itself in varying levels of catastrophe. Which significantly increases incidental costs.

“ National Australia Bank has been forced to write off \$1.75bn this week as the result of a computer error that went undetected for two years.

The company bought its HomeSide Lending Unit, based in Jacksonville, Fla., in 1998 for about \$1.2bn. At the time, NAB executives praised the unit's proprietary and processing systems, saying they would be used throughout the bank's global network.

The write-down resulted from the fact that HomeSide had been feeding the wrong interest rates into a critical valuation model since 1999.

”

Financial Times, October 26th, 2001

All too frequently software is designed and built for a specific requirement, based on the business environment at the time of design. What starts out as a variable, may quickly become an immovable objective in the minds of managers. Some managers factor in foreseeable future requirements. All will fail to spot every possible future impact on the system.

Errors are often designed into systems from as early as the requirements. Multifaceted process and data models add to overall complexity and significantly increase error probability.

As shown by the BCS findings (see Page 1), most IT developments encounter difficulty. It is common for activities such as QA/Testing, Change Management and Documentation to be scrapped or downgraded when projects are under delivery pressure. This short-term approach simply passes problems on to the future, often only becoming apparent when a legacy system needs updating leading to issues such as:

- No one can understand how the system works as the documentation is poor or non-existent
- Minor changes frequently create unforeseen problems, usually much bigger than the original problem. This turns what appeared a simple task into a high cost never ending project

The Business Case for Enterprise Testing

'Enterprise Testing' is the name given to an holistic approach to quality assurance and testing of business systems. The process allows executive management to look at projects and understand their impacts, risks and costs to the business.

Executive management must retain a clear understanding of how such an initiative will benefit the business and demonstrate a willingness to support it from the top down. Due to the potential complexity of such an approach, a robust and proven process is a pre-requisite with automated management tools to enable efficient collection and analysis of information.

According to independent analysts, Newport Group, Inc., business can benefit in the following ways:

- Improved business-user satisfaction
- Heightened business-user confidence
- Positive business reputation
- Increased efficiency of daily business processes
- More effective use of IT staff
- Decreased expenditure on technical support and maintenance
- Protection against legal responsibilities
- Digital Risk definition, assurability and insurability

Test automation provides insight into the functionality and performance of applications before they move into production. This enables consistent tests and corresponding results to be repeated and re-used, improving accuracy and coverage of quality control while reducing costs. Tasks such as generating check lists for an upgrade or maintenance project can be performed simply via report generation from historic test data that has been proven and validated against the actual system.

Demonstrating compliance with specific business rules or regulation can be achieved via similar methods, extracting reports based on actual data that can be maintained and kept up to date significantly more efficiently than via manual systems.

Management can track all impacts back to the requirements, validating the system against the actual business need and assessing the impacts of both business and system change throughout the project, without the need for detailed expert knowledge of the underlying technology.

As with any automated system, the usefulness of the tool and its output depend heavily on the accuracy and relevance of the data used, when and where it is used, and how it is applied and managed.

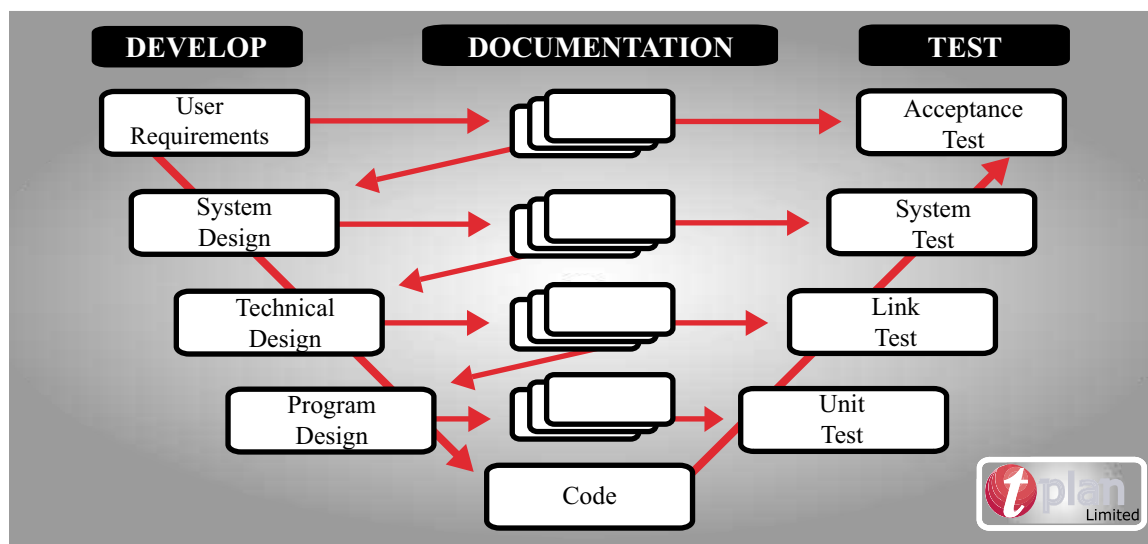
Beware, automated chaos is still chaos - only faster!

In a survey carried out at the Software Test Analysis and Review (STAR) conference in 1998 by Dot Graham, an independent QA/test consultant, over 95% of IT and Test personnel confirmed they had QA/test automation tools that were 'shelf-ware' - and not used.

A proven process is required to formalise and control the project from the perspective of quality assurance, and ensure that the tools and the project are fit for purpose when implemented.

Benefits of 'Best Practice' Process

The benefits listed overleaf for Enterprise Testing can only be reliably achieved by the application and maintenance of efficient and proven procedures or methodologies. At the management level, the method proven to be efficient and reliable is the 'V' model.



V Model Schematic, Copyright (C) 2002, T-Plan Ltd

As can be seen from the diagram, the 'V' model is constructed with each component being interdependent with the next. This structure enables changes to be cross-referenced throughout the system, allowing impacts of change to be assessed before the change is implemented.

- **The key advantage for business managers is that all changes can be tracked back to, or generated from, the requirements**
- **This enables impacts to the project, or the business, to be accurately assessed in terms of business risk and project cost**

Management of the volume of data required to effectively implement the 'V' model is impractical and costly using manual methods. The 'V' model demands up to date, accurate and timely data input or capture, in order to deliver value.

As not all tests can be automated, the management tool must be capable of capturing data easily from manual input, automated test execution tools and requirements tools, together with other common business and project management tools. As not all systems are the same, the tool must allow managers to assess projects for a variety of platforms and environments. The information management tool must therefore be platform independent.

The benefits can only be cost effectively achieved consistently across an enterprise by using a platform-independent, automated information management tool, with broad support for industry standard communications and user interfaces that incorporate proven process, such as the 'V' model.

Good Process Management Accommodates Change

By applying structure and control to IT, the data it holds and the processes it supports, management can identify, value, leverage and communicate with stakeholders based on accurate assessment of valuable business assets.

- Identify and quantify business risks
- Accurately assess the impact of change on business assets
- Capture and leverage business knowledge and IP
- Measure and audit IT and business process performance

“ For quoted companies, bridging the gap between balance sheet net assets and stock market value would be an extremely useful expansion of shareholder information. Simply identifying unrecorded intangible assets and indicating their value would be a major step in the right direction. ”

John Coombe, Finance Director, GlaxoWellcome. June 2000

Process Management Tools

Process management tools that focus on IT have largely grown out of the software quality assurance and software testing industries. Given their focus on processes for test, audit, validation and compliance, it is not surprising these industries are leading the way with process management tools.

There are few process management tools that do not lock the business into a range of 'sub-tools' and services that are integrated and supplied from a single organisation, or its approved 'agent'. It can be argued that a single source supplier has benefits. However, it can also be argued that the business will not always get the best 'sub-tools' or services for the job.

Ovum, the independent research group specialising in analysis of IT quality assurance tools and processes, stress the importance of linking business requirements and process to the QA and testing of IT systems. Yet many of the QA process management tools focus on IT and stop short of business requirements.

What is required is a process management tool that is flexible, accommodating other processes and tools, while being structured and consistent with best practice recommendations.

The T-Plan Process Management Solution

T-Plan was designed as a process management tool from the outset. It has continued to prove itself at high profile client sites such as the International Securities Market Association (ISMA).

“ The introduction of a testing methodology and process across the product range is proving ”
itself by saving time and resources.

Over the years T-Plan tools have been adopted by many City institutions, the UK Government, utility companies, Telco's and other leading organisations in the UK and abroad who are committed to measuring, managing and assuring the high quality of core assets inherent in IT, know-how, and efficient business process.

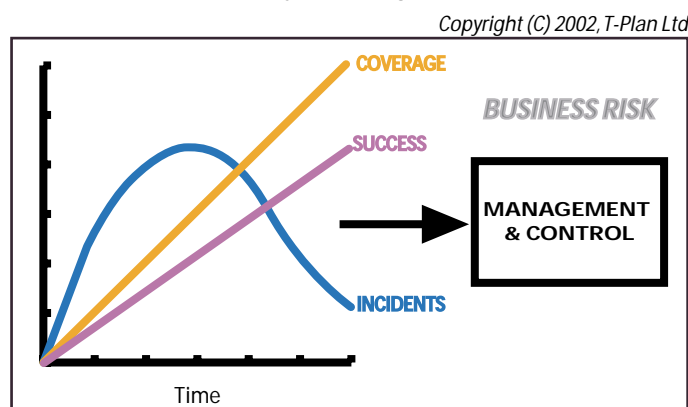
“ T-Plan is fully consistent with Ovum's Test Management philosophy.

If you need to introduce more order structure and visibility into your testing process, you will welcome the T-Plan method and tool. ”

Ovum Evaluates: Software Testing Tools 2000

As can be seen from the extracts and statements from respected sources quoted in this set of three papers (see page 15 for content summary of set), corporate governance and IT governance are one and the same. Information management is crucial to the survival and success of the organisation, knowledge is an asset.

In 2003 the law will begin to force companies to report on organisational risks and intangible assets. Effective processes, and the management tools to leverage the information they provide, are urgently required to ensure management have, and can prove the credibility of, the information they will be responsible for accurately reporting.



Most sources estimate IT risk as between 50% to 70% of the risks faced by businesses as we move deeper into the new economy - the IT revolution. If this is the case, T-Plan tools are well positioned to help organisations remove a significant element of business risk while; complying with new regulations, implementing best practice, improving productivity and reducing costs.

It's hardly surprising that Ovum and many of the world's leading businesses rate T-Plan as the pre-eminent QA/test process management tool.

Conclusions

Software Quality Management (SQM) is a relatively new term to most executive management, many may not even be aware of the scale of the problem.

The examples of IT disaster selected for this report were drawn from over 50 major incidents reported on various SQM web sites during the months of September and October 2001. These disasters consistently demonstrate:

Lack of access to effective quality assurance processes and tools, and the management information they provide at user, management and board level, is a high-cost and high-risk business strategy.

After 11th September 2001, John Gilligan, the US Air Force's deputy CIO, with the security threats posed by weak and poor quality IT, was driven to publicly state:

“ It is clear that the quality of software design and testing in the past does not measure up to the needs of the present or the future,” Gilligan said. “I challenge the leaders in the software industry, especially in the wake of the physical attacks on this nation, to establish new standards of software quality, as well as effective methods to reduce the impact of current vulnerabilities.”

This report concludes that, with senior management commitment to measurable quality, a structured approach to quality assurance can make a significant difference to development, implementation, integration, upgrade and maintenance of small and large scale IT business assets; improving the overall performance of the business, its systems and processes, while reducing the costs of achieving higher performance.

In order to achieve these significant business benefits and rise to Mr. Gilligan's challenge; business, political and other leaders need to make a commitment to best practice.

- Investing in proven processes and efficient tools
- Understanding the costs and risks associated with change and IT
- Building on best practice by fostering a culture of continual process improvement
- Leveraging the business QA/test data assets to provide repeated and consistent business value across back and front office business systems and processes

T-Plan QA Management Solutions

T-Plan has gained its expert knowledge of software quality assurance and test management since 1984. The T-Plan tools, incorporating the 'V' Model management process, are delivering results in over 100 blue chip clients worldwide. We are able to provide a comprehensive range of testing related services to support clients in test management and test execution.

The services comprise:

- Creation of Test Strategies and Test Plans
- Implementation of formal test processes and methodologies
- Implementation of test automation
- QA Management Tools installation
- QA Management Tools implementation within a project/s
- Review of current practices
- QA Management Tools customisation
- QA Management Tools upgrades
- QA Management Tools conversions

“ If you need to introduce more order, structure and visibility into your testing process, you will welcome the T-Plan method and tool. ”

*Ovum Evaluates, Software Testing Tools
2000*

T-Plan QA Management Tools

T-Plan QA Management Tools may be obtained direct from T-Plan, or via a network of T-Plan authorised professional quality assurance partners operating in most regions throughout the world.

The QA Management Tools comprise:

T-Plan Professional allows you to manage every aspect of the testing process, providing a consistent and structured approach to testing at the project and corporate level.



Errors or queries found before or during the Test Execution can be logged and tracked throughout the Testing Lifecycle in T-Plan Incident Manager.

T-Plan Administrator provides a centralised point from which to administer an entire T-Plan Professional enterprise/workflow.



Errors or queries found throughout the whole lifecycle of the project can be logged and tracked remotely using the Web version of the T-Plan Incident Manager QA tool.

IT Quality Assurance

The T-Plan suite of quality management tools has been designed to address the business and IT risk and quality assurance issues identified in this report.

It enables senior management to accurately identify, assess, manage and control the business, operational and IT risks; from design through to implementation and ongoing use or maintenance of the business systems.

“ T-Plan is one of a few testing tools that start at the beginning of the development lifecycle. ”

Ovum Evaluates: Software Testing Tools, 2000

T-Plan Benefits

- Captures the knowledge base of the business, establishing a risk benchmark
- Facilitates best practice process, compliance, and validation throughout the enterprise
- Empowers executives with measurability, auditability, and accountability
- Improves user confidence, trust and efficiency

Insurance

Using T-Plan reduces costs and risks associated with Digital Risk insurance. It enables businesses to prove and validate their digital risk exposure, and it enables underwriters to accurately assess, monitor and audit digital risks.

T-Plan helps organisations and executives reduce exposure to:

- 3rd party liability
- 1st party losses
- Crime
- Product or service failure
- Business interruption

Executive Features & Benefits Summary of T-Plan

The T-Plan product features and associated benefits are presented segmented into three groups:

- *IT and Operations Management*
- *Project and Personnel Management*
- *Business and Financial Management*

IT and Operations Management

Feature	Benefit
Insurable Risk	<ul style="list-style-type: none"> Reduced exposure to business recovery risk. Reduced exposure to underwriting risk. Reduced Premiums. Reduced Data Protection risk exposure. Reduced 3rd party risks.
Assurable Risk	<ul style="list-style-type: none"> Reduced exposure to business risk. Improved stakeholder reputation. Quantifiable and accountable IT and business development. Reduced liabilities. Defined and measurable IT/IP data assets and associated risks.

Project and Personnel Management

Feature	Benefit
Clarity and Visibility	<ul style="list-style-type: none"> Improved communications throughout project and system life cycles. Reduced ambiguity and error. Improved user trust and confidence. Quantifiable performance and accountability.
Structure and Framework	<ul style="list-style-type: none"> Proven method incorporating best practice. Knowledge capture and continuous process improvement. Reduced user training and error. Enables "What if" project change and business risk analysis. Reduced user training and error. Validates regulatory and business rule compliance.

Executive Features & Benefits Summary of T-Plan

IT and Operations Management

Feature	Benefit
<p>Incorporates the 'V' Model</p>	<p>Robust and proven process.</p> <p>Enables business managers, and other project personnel, to track impacts of technical changes against business requirements.</p> <p>Provides structure, control and auditability to quality assurance.</p>
<p>Field Proven since 1990</p>	<p>Robust tool and utility set.</p> <p>Proven platform, environment, and application independence.</p> <p>Intuitive and easy to use interface for all levels of user.</p>
<p>Most Highly Rated Tool Globally</p> <p>Rated by Ovum Ltd, an independent specialist evaluation consultancy</p>	<p>Widely accepted and used by professional QA and test personnel.</p> <p>Supported in three time zones.</p> <p>Broad range of interfaces to industry leading IT tools; from requirements management test execution to maintenance, supporting the entire life cycle of the asset.</p>
<p>Independent Management Tool</p>	<p>T-Plan Ltd ownership is not associated with test execution tools, or other QA tools.</p> <p>It incorporates direct links to leading third party tools and incorporates open interfaces for other tools to be linked easily.</p> <p>The T-Plan products are complimented by an independent professional user group, chaired by the Bank of England.</p>

Credits

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Additional papers available in this "Executive Guide To" series:

- An Executive Guide To: Reducing the Business Risk of IT
- An Executive Guide To: Introducing Regulation into IT and Process

For further information please contact: sales@t-plan.co.uk

Sources

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- "Oops! Bank Will Write Off \$1.75bn." Financial Times World Media Abstracts via Comtex. www.ft.com
- *Ovum Evaluates, Software Testing Tools.* Ovum. www.ovum.com