

---

# QA TO THE RESCUE

---

A case study in how improvements in Quality Assurance methods helped a real-world project achieve its goals.

Prepared by Celtic Testing Experts  
CelticTestingExperts.com  
678-462-2835

Written by

J. Hank Rainwater  
Chief Technology Officer  
[HankRainwater@CelticTestingExperts.com](mailto:HankRainwater@CelticTestingExperts.com)

3 March 09

## OVERVIEW

---

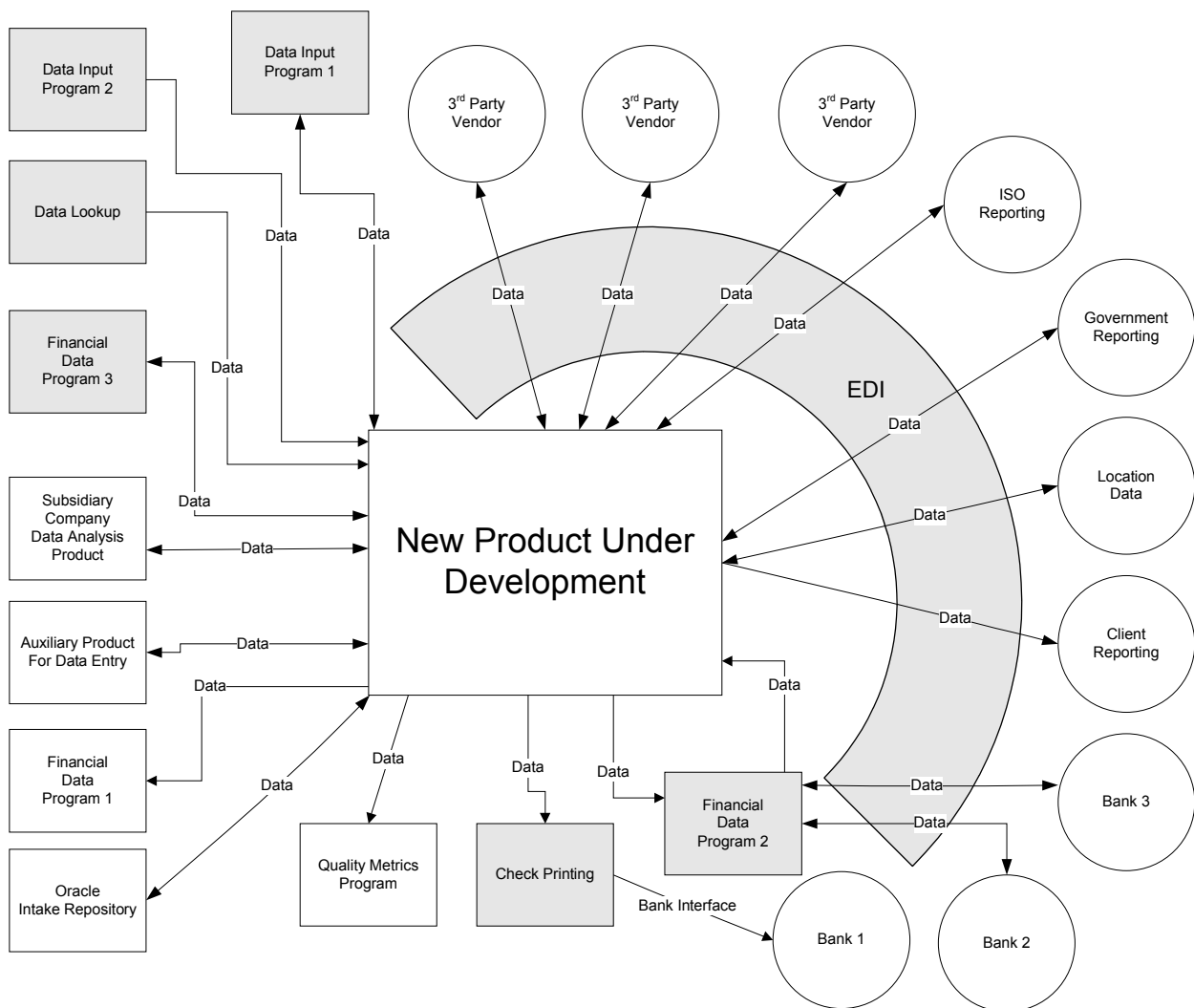
This is a case study of a real-world project in which Celtic Testing Experts (CTE) participated. The author was not an employee of CTE during the events described in this study but rather an executive member of the project management team described herein.

The case study is presented in the following format:

- **The Project:** a brief pictorial description of the product being built. Some aspects of the description have been generalized to eliminate any reference to proprietary systems in use by the company under study.
- **The Corporate Culture:** a description of the organizational dynamics that governed the various teams working to accomplish project goals. The interpretation of these dynamics are the author's own but based on many years as an employee in the company, thus offering direct observation of events as they unfolded as well as an experience of the unintended consequences of these events.
- **The Timeline:** key project milestones and events are shown schematically in this section. These events are a matter of public record and presented in the actual sequence in which they occurred.
- **The Problems:** the difficulties the team experienced in meeting corporate deliverables.
- **The Solutions:** how the teams, and specifically the QA team and leader, contributed to the eventual success of the project.
- **Lessons Learned:** a summary of what you can take away from this study to help you in your daily work.

## THE PROJECT

An aging mainframe system, at work since the early 1990s and evolved over time to interface with many other systems, needed replacing. As is obvious from the diagram below, the replacement product had numerous interfaces to other, and even older systems, than that which it was intended to succeed. While the complexity is somewhat surprising, it is typical of many large enterprises whose systems growth spanned the mainframe, client/server and web-based data management eras.



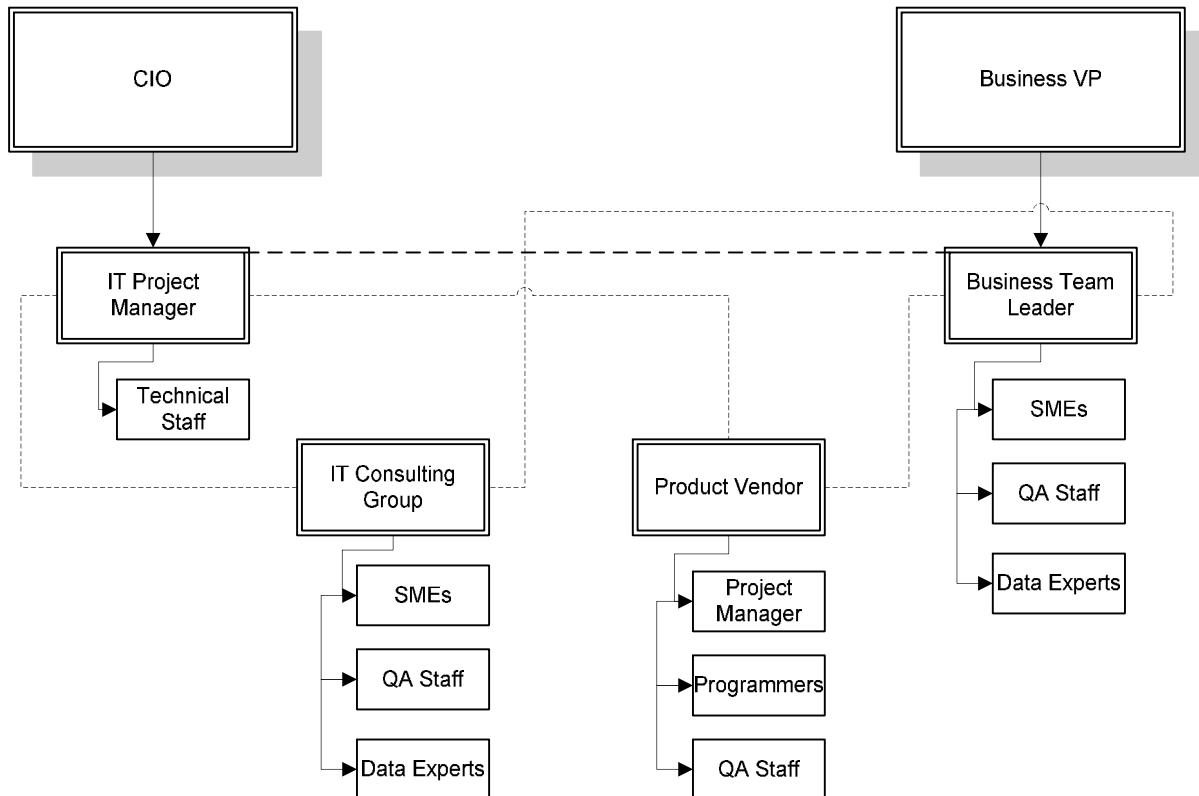
## THE CORPORATE CULTURE

---

A publicly traded company with a global network of more than 700 offices in 63 countries with over 7000 employees has been in business since the 1940s. In the last five years of the last century, the company had had 3 CEOs and 2 CIOs and outsourced most of its IT staff and some of its business subject matter experts (SME). During this time of turmoil, they embarked on a massive program to replace all their IT infrastructure and custom-built software in a 2 year 9 million dollar program that was eventually canceled. The company was left with their legacy systems, which still managed to be efficient enough to keep the company profitable after the turn of the millennium; nevertheless, the leaders at the time knew they would have to take action soon.

In 2003 three SMEs who knew the business very well were tasked with generating the requirements for a new product and the CIO searched for any off-the-shelf or customizable software product that might satisfy the requirements. A vendor was found who was willing to modify their existing product to meet the company's needs.

Contractual considerations resulted in a product development team comprised of several disparate groups, separated geographically and managerially. The structure of this team is shown below:

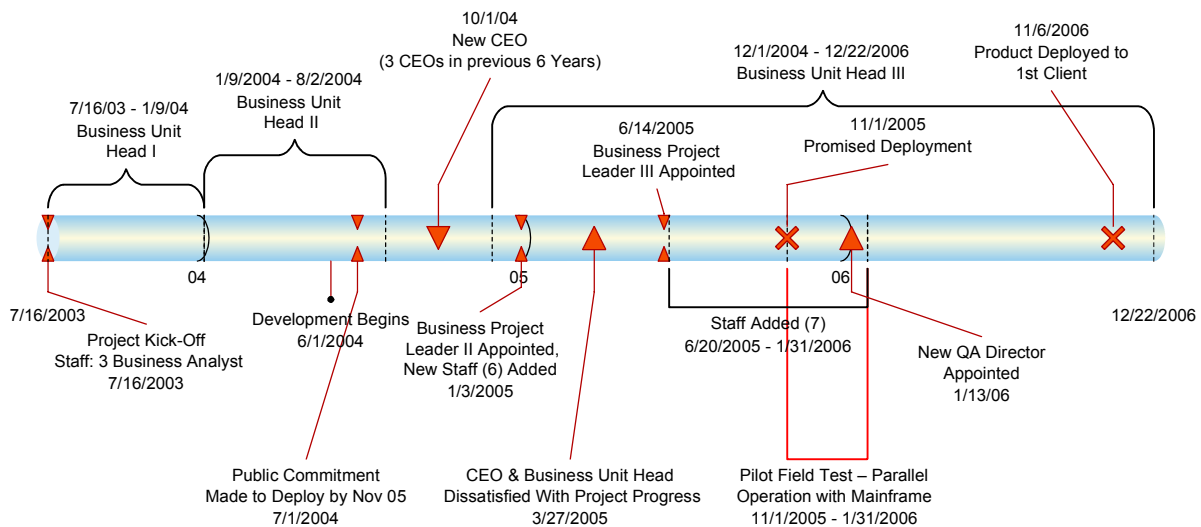


Dotted lines (---) denote relationships without direct managerial control. There were numerous informal relationships between the IT Consulting Group – comprised of many former employees of the company – and the remaining IT and business staff of the company.

## THE TIMELINE

The project began in 2003, as mentioned previously, with 3 subject matter experts. As the team grew in size, with actual development commencing in 2004, the CEO made a public commitment to financial analysts and shareholders that the product would be in production by November of 2005. The work did not go well in 2004 and by early 2005 the goal of a successful deployment was viewed as unlikely.

An overall timeline of events is shown below.



## THE PROBLEMS

The overriding problem with the project was rooted in management and flourished in a culture characterized by:

- **Corporate Desperation:** the company had waited too long to embrace client/server technology in the early 1990s and ignored the transition to web-based deliver of products by the early 2000s. This is not uncommon in many organizations and even today there are many older software products, built in the late 1990s and delivered by Citrix, that still serve a vital business purpose. The mainframe still has a role and it has been given a new face with various presentation technologies. Nevertheless, the company was paying an enormous price for infrastructure to support its business model with several systems far beyond their expected supported lifetime. The perception in the marketplace of the company's systems was also resulting in clients considering other vendors for services.
- **Bureaucratic Viscosity:** the turmoil in upper management and past failures had resulted in an ineffective and disjointed product development group. Business leaders with little technological background had grown increasingly skeptical of IT leaders who promised

much but delivered little. All of this led to a failure to act when needed and a fear of a decisive and responsible management style.

These problems can be depicted in the project management domain by the classic corporate brawl anti-pattern<sup>1</sup> shown below where project leadership fails to balance expected pressures that threaten success.



Specific manifestations of this anti-pattern resulted in many of the delays experienced by the project since its commencement. In the QA domain, this anti-pattern resulted in an overall lack of coordination and effectiveness enumerated as follows:

- Test script development was hampered by changing requirements.

---

<sup>1</sup> Brown, W. J., McCormick, H. W., Thomas, S. W. *AntiPatterns in Project Management*, (Wiley: New York, 2000), p. 81.

- Unqualified staff was assigned to develop test scripts.
- Time zone differences between the 3<sup>rd</sup> party development team and corporate QA staff resulted in validation delays and extensive rework.
- Conflicts in areas of ownership between the several QA teams resulted in duplicate or missed testing cycles.
- In spite of extensive use of QA tools such as Quality Center, real-time metrics that would supply project leadership with actionable information were difficult to obtain.

---

## THE SOLUTION

---

In a project of this scope, and with the constraints imposed by the corporate culture, mitigating project risks proved to be very challenging. Several business team leaders had failed and been replaced in the course of the project. By the time leader number three had come onto the scene the project was on a downward spiral toward failure. Almost two years had transpired since the project started and the public deadline for deployment was five months away. Believing that the right people using a well-structured process were necessary to achieve success, the business side of the project began to exert a positive influence on the other teams.

The first step toward mitigating the imminent failure of meeting the public deployment date was to redefine the meaning of that deployment. After much political and practical discussion, corporate leaders accepted a parallel pilot program with the product as an acceptable alternative to actual replacement of the mainframe system until a later date. The effect of this decision was to recalibrate requirements based on actual user input and buy time for the development team to regroup and regain traction in their efforts.

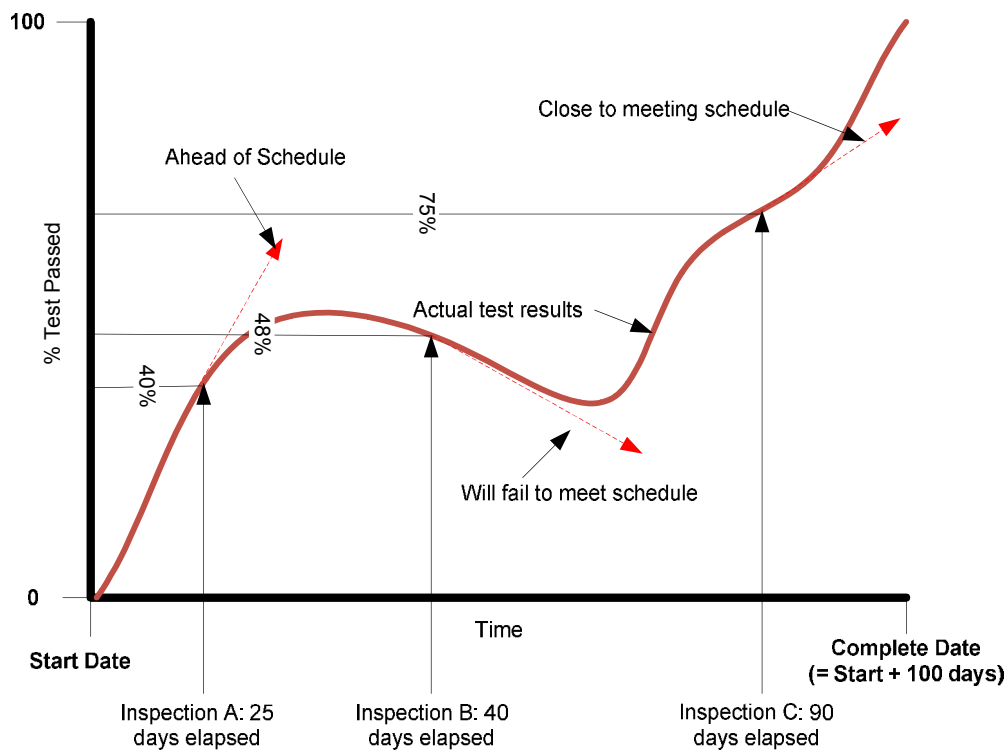
The second step – and in retrospect the most critically important – was to consolidate the QA staff under a single leader who was able to improve overall development throughput. While QA can't always improve every aspect of an organization's effectiveness, they can speed up the testing cycles so that rework time is minimized.

The specific steps that the new QA leader took were as follows:

- Realigned tasks and personnel to better fit skills and depth of experience.
- Held daily team meetings with QA staff to coordinate testing efforts. Often these were of the 'scrum' variety and often held standing.
- Mentored staff as needed to increase motivation and effectiveness.
- Generated daily metrics and weekly reports for all teams that informed leadership decisions.
- Reviewed test scripts and execution plans with QA and development staff at regular intervals.

- Coordinated daily conference calls with off-shore developers and performed triage on project priorities.
- Implemented best practices with Quality Center, the primary test management tool.

One of the specific metrics generated by the QA leader that was useful at a project management level was an estimate of test cycle completion time. This was based on analyzing the rate at which tests were passed and projecting when a specific percentage goal of passed tests would be reached. Graphically presented, the metric produced data that can be viewed and interpreted as shown below:



This type estimate of a testing cycle completion date proved invaluable in allocating resources and planning for subsequent project development steps.

## LESSONS LEARNED

While many of the solution steps above are obviously common management sense, they were almost revolutionary in the corporate culture in which the project teams existed. Indeed, if one were to coin an acronym for the effort it might go like this:

## Business – Acumen – Strategy – Innovation – Common - Sense

In other words, getting back to BASICS can often save the day. When you drill-down on this acronym in the context of this case study the following lessons were learned:

- Business Acumen: QA personnel must have an understanding of the business processes that they are attempting to test. QA testers are not just button pushers or script runners in spite of the fact that sometimes this does seem to be what they do day in and day out. With knowledge of the requirements based on being included early-on in the development cycle, QA can make the best possible contribution to achieving timely results.
- Strategy: While the word ‘agile’ is often used to advertise the unique nature of what a team can offer, the reality often falls short of the classic principles outlined in the Agile Manifesto (<http://agilemanifesto.org/>) where value is placed on:
  - Individuals and interactions over processes and tools
  - Working software over comprehensive documentation
  - Customer collaboration over contract negotiation
  - Responding to change over following a plan

None of these value statements diminishes the importance of following best practices, using state-of-the-art tools, documenting the work, or having a valid contract and keeping to a schedule. They simply state that software is a creative enterprise that requires constant human interactions and review to achieve success and that was the strategy employed by QA in this project.

- Innovation: trying something new can be part of strategy but it must be justified by the standards and constraints of the corporate development ecosystem. In this project, what became innovative were daily meetings, effective conference calls, assumption of responsibility and follow thru on action items.
- Common Sense: without being redundant, common sense in this project’s context meant using basic management practices such as never expecting what you don’t inspect and holding personnel accountable for their performance.

With regard to the tools that aided this project, as mentioned, Quality Center was the primary test management tool. Most tests were run manually and test script creation was a large portion of the daily work accomplished by QA. Over 7,000 test scripts had been created by the 4<sup>th</sup> year of the project. Best practices enforced by QA on this project included:

- Meaningful categorization of test sets in a logical hierarchy representative of the development project plan.
- Customization of QC status values to effect accurate prioritization of defects and failed tests as well as speed rework by the development team.

- Monitoring of QC usage to ensure testers accurately follow the guidelines established for the project.
- Coordination of test data availability to ensure the product was ready for regression and system testing when called for according to the project plan.
- Partitioning of the test environment so overlapping and potentially conflicting test cycles could proceed on independent paths.
- Creation of 'smoke test' test sets to ensure new builds did not have obvious flaws that could delay scheduled test cycles.
- Monitoring of staff test execution rates to ensure effective use of personnel.

In summary, by alignment of trained people with effective processes, the QA team was able to demonstrate superior performance as compared to the project's historic norms and this encouraged other teams within the project to emulate their practices. The net effect was the delivery of the first production version of the product in November of 2006. That first version has continued to serve the clients well with minimal maintenance releases since the first deployment.

---

## POSTSCRIPT

---

The lessons learned on this project eventually led to the author becoming a part of CTE. We have applied those lessons to the services we provide as consultants and continue to help the company described in this study with personnel resources.

In 2008, CTE created **CTE FORESIGHT**™, a forecasting dashboard for Quality Center. This product incorporates many of the algorithms that produced the metrics described in this study, specifically the trend analysis described on page 8. This product was designed to address questions like those below:

- Do you know the REAL TIME status of your strategic projects?
- Is your current reporting meaningful?
- Would you like to know when your project will be completed?
- Would you like to know your ROI for your people, processes and tools?
- Can you get your project statuses anywhere in the world?
- Would you like to shorten your testing cycles?

**CTE FORESIGHT**™ will provide you with the answers to these questions and many more. Checkout our six minute demo presentation at [www.CTEForesight.com](http://www.CTEForesight.com).