

Delivering quality, reliable software

Derian Scott explains why IPL's mission statement to provide customers with high quality, high reliability software is as relevant today as it was when IPL was formed over 30 years ago.



Over 30 years of quality software

When IPL's founders were formulating the idea of starting up the company, they were developing software for the European Space Agency. They recognised that quality must be assured for the successful design, production and delivery of software that meets the customer's requirements and is totally reliable.

Prior to winning their first contract, IPL's founders produced a mission statement and a set of standards based on the 'V' model. These standards were the precursor of IPL's ISO 9001:2008/TickIT certified Quality Management System (QMS), which, to this day, governs the quality of all work undertaken for our clients.



Extract from IPL's mission statement:

- To provide customers with high quality, high reliability software within timescale, budget and specification;
- To employ staff of the highest calibre and train them fully in IPL's rigorous software development methods.

As part of the QMS, IPL defined the standards, procedures and guidelines that dictate a framework within which software systems can be engineered to their specifications at minimum software life-cycle cost. Originally paper-based, IPL's Software Code of Practice (SCOP) was bound and distributed to every staff member. SCOP has subsequently evolved to keep pace with changing technologies and methodologies, and is now on-line and available as a reference for all IPL employees.

Capturing issues earlier

Too many projects end up incurring extra costs towards the end of the programme because of corner case issues emerging during integration. Finding problems at this stage can hugely add to the time or monetary cost of a project.

IPL's software development processes encompass the entire system lifecycle, from concept through to deployment and support. As soon as our engagement starts, we aim to understand the customer's requirements and how we should deliver against them. By being proactive in highlighting and resolving issues at the earliest opportunity, we reduce the chances of rework being required during the later stages of the project. We rigorously follow processes giving the customer assurance that all safety, security, reliability and other critical objectives have been met. This assurance can be measured against the requirements and any recognised and agreed industry standards.

Robust, reliable and on time

The result of this disciplined approach is that our products are robust and well engineered, supplied on time and within budget. This means we maintain project schedules, minimise risk, and reduce implementation and testing rework costs, including time in the test lab.

"Over a number of years IPL has worked as an integral part of Thales demonstrating the ability to provide quality software on time over several projects. A particular strength is their ability to work on difficult ambiguous requirements providing much needed help in a reliable and dependable way."

Greg Roberts, Managing Director NS&R, Thales UK

Crucially, systems developed in this thorough and accurate way are great value for money as they invariably give years of trouble-free service.

Quality through testing

Recognising the need to validate software, IPL set about developing a set of testing tools. Cantata++ and AdaTEST 95 have been at the forefront of software verification since their introduction in early 1990s. Their use has featured in many high profile projects ranging from telecommunications, medical instruments, air-traffic control, avionics, rail transport, automotive, space, defence, nuclear energy, financial and digital broadcast systems. The common factor in all of these areas is the imperative to produce software with low defect rates, which reliably "does what it should do" in a cost-effective manner.

"AdaTEST has enabled us to meet all contractual requirements on evidence of unit testing."

BAE Systems

A track record that speaks for itself

Thorn EMI (now part of Thales)

IPL's very first customer in 1979 was Thorn EMI in Wells. We worked on a system that enabled NATO mixed force Airborne Early Warning (AEW) aircraft to communicate with the air defence ground segment. The system provided an integrated Recognised Air/Surface Picture (RASP) by correlating the AEW derived tactical data with that held in the Enhanced Radar Air Picture Display System.

This project was delivered on time and to budget, but most impressively, on its first live acceptance trials with the AWE aircraft, it worked perfectly.

Cobham Mission Equipment

In 1987, Cobham Mission Equipment decided to implement the world's first microprocessor-controlled air refuelling system. Cobham Mission Equipment itself lacked the necessary experience to develop safety-critical software, which would be subject to FAA approval, and so selected IPL as a software development partner.

IPL software controls safety critical aspects of in-flight refuelling systems in use by several national air forces

IPL took full responsibility for all software development and quality assurance, complying with the specified standards for each end customer. These included DO-178B Levels A and B and DOD-STD-2167A.

IPL's Software Code of Practice maps to DO-178B

Orange

IPL was responsible for developing the heart of Orange's Prepaid system – the Prepaid Control Function (PCF). This application provides real time rating and control of all of Orange's prepaid calls, SMS, MMS and data access. IPL has supported the PCF since the launch of the prepay service more than a decade ago, providing a host of bespoke enhancements and applications that have allowed Orange to quickly introduce new innovations to the market.

IPL software controls in near real-time the prepay balances of over 20M subscribers to a UK mobile operator

Nationwide

Nationwide wanted to apply the benefits of technology to the time consuming process of applying for a mortgage. The solution was to provide their customers with an on-line application system capable of capturing all of the information necessary to make a decision in principle instantaneously.

Nationwide had already been impressed by IPL's capability as a supplier of software engineering resources and tasked us with developing the complete e-business front end for the new process

and its interaction with back-end systems, via web services. The project was completed in less than five months, from requirements through to implementation, and crucially was delivered on time and within budget.

"IPL has proved to be a very reliable provider of high quality project staff. The people have blended easily with our developers and produced high-performance project teams. We are delighted with the results."

**Dr Michael Humphreys, Head of Technology Development
Nationwide Building Society**

Our standards and processes experience

- DEF STAN 00-55/56
- DoD-STD-2167A
- IEC 61508
- MIL-STD-882B
- RTCA DO-178B
- FDA 510(k)

Summary

By adhering to our fundamental belief that all customers should be provided with high quality, high reliability software, we have maintained a formidable reputation of delivering within timescale, budget and specification.

Clients entrust IPL with their most sensitive and critical systems knowing that we will not let them down. We focus on providing a great service; we don't play politics, and always fulfil our commitments. Our record of successful delivery is exemplary.

In the 2010, over 97% of IPL's business was derived from our existing client base

IPL has a culture of excellence and quality. We employ, train and develop talented staff. We operate to the highest levels of business integrity and we're genuinely passionate about doing a good job for our clients. That's why our clients keep returning.

Derian Scott is a Project Manager at IPL, specialising in the delivery of high integrity Aerospace and Defence solutions, and can be contacted at derian.scott@ipl.com.

Further Reading

- Cobham Mission Equipment Case Study
<http://www.ipl.com/papers/case%20studies/aerospaceanddefence/Cobham%20-%20In-flight%20Refuelling.pdf>
- Microsulis Medical Device Case Study:
<http://www.ipl.com/papers/case%20studies/other/Microsulis%20-%20Medical%20device%20software.pdf>

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