CANTATA

QA SYSTEMS
The Software Quality Company

SECTOR Railways
STANDARD EN 50128

Case Study

THALES

Thales
(Formerly Alcatel and Siemens Transport)

Test Track Facility

"They were professional, flexible and experts in their field"

ABOUT THE COMPANY

From aerospace, space and defence to security and transportation, Thales helps its customers to create a safer world by giving them the tools they need to perform critical tasks.

"Looking back, we are very pleased with the choice of Cantata"

Background

With the creation of the European Rail Traffic Management System, the European railways industry was encouraged to create an interoperable European Train Control System (ETCS). Thales understood the importance of this project and invested extensively in R&D, so as to produce innovative ETCS solutions.

Critical Software Testing Requirements

The main task was to develop two applications: one for radio block control on trackside, written in C++, and one for the train itself, written in C. The development environment was hosted on Solaris and the selected target architecture was a Thales-developed system known as TAS. For obvious reasons, the software had been assigned to the **highest safety integrity level** (SIL) defined by CENELEC. This SIL demands- among other quality assurance activities- the testing of software at all levels, from module to system, including defect tracking. Thales was required to demonstrate that the code had been unit tested, and also that 100% coverage of statements and 95% coverage of decisions had been achieved during testing. Test execution was to take place in the simulation environment based on the Solaris host.

Reliability

Thales began searching for software testing tools. Their overriding requirement was reliability - from both the tool and its supplier. Thales' Patrick Roßbach, involved in the tool evaluation, asserted: "***The advice we obtained from Cantata's providers was first class. Throughout our dealings, they were professional, flexible and experts in their field. We immediately identified that they were people we could work with***."

ETCS Test Vehicle

Easy integration

As Elbert Voigt, the leader of Thales' development team, explained: "*The demands of CENELEC expected that our development environment would have to be supported by comprehensive configuration management, requirements management and traceability, use of CASE tools from analysis down to code generation and multi-level testing*." An important part of the evaluation, therefore, was to see how compatible Cantata was in such a multi-tool environment.

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Voigt added, "*It was essential to use flexible tools that could 'slot-in' easily to this structure*." Cantata had to prove its adaptability by being integrated into a hierarchical 'make' structure for regression testing, by integration with the CASE tool for test case design, and by allowing the publication of test results via a web-based Information Management System.

Training Expertise

As part of the technical evaluation, Jürgen Sievers attended training courses by Cantata developers in Munich. He remarked, "***The courses explained exactly the problems we had envisaged when considering testing object-oriented software; the Cantata solutions to these problems were truly remarkable***." Roßbach also commented: "*One of the decisive reasons that Cantata became a success story in our project, was the participation of all developers on the provided training programmes. During the courses, not only was the tool's handling taught but, more importantly, the general principles and aims of the module testing process were clearly explained*".

"The advice we obtained from Cantata's providers was first class!"

Coverage improves motivation

Using Cantata not only led to higher software quality, but also to a sense of increased **pride and motivation** amongst team members. Cantata coverage analysis, used in conjunction with the Cantata test harness, proved that the software had been well tested. One team member remarked: "***Measuring the coverage reached during module testing seems to give some developers a new experience about the progress of their work***. *Usually during development activities it is difficult to estimate the maturity of work. Recognising the rising coverage gives direct feedback about the effect of module testing and motivation to complete*."

Conclusion

Roßbach concluded, "***Looking back, we are very pleased with the choice of Cantata***. *Technical, organisational or formal problems and unexpected challenges arose along the way, as is usual in business projects. These could not always be solved easily, but the professional support and help that was provided always saw us through*."

Thales knew that they needed to test their high-integrity software. They wanted a 'state of the art' testing solution, backed up by excellent technical support and training. Cantata proved itself in a mission critical environment and Thales' confidence in the tool, and its provider, was justified by the tool's successful deployment on the ETCS program.

All case study text has been approved by the relevant customer.
QA Systems acquired the Cantata business taking over all development, support and sales from IPL in March 2012.
Cantata is the extension of the Cantata++ tool.

CERTIFICATION

Cantata has been classified a **Class T2 Tool**, as usable in development of safety related software up to the highest safety integrity level (**SW-SIL 4**) as defined by the **EN 50128** standard

For information on tool certification, please visit:
www.qa-systems.com/cantata

MORE ON RAILWAYS SECTOR:

Our Sector Briefs provide more information on how Cantata was succesfully used by relevant customers in various railway projects worldwide.

All Sector Briefs can be found on the QA Systems website

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