

**SECTOR**  
**IT & Telco**

# Case Study



Simoco Group

**ABOUT THE COMPANY**

Connections count, and with a history of over 70 years in radio engineering excellence, Simoco combines innovation in two-way radio design with extensive experience in delivering systems that connect people when it really matters.

We provide integrated communications solutions which support the operational needs of utilities companies, airports, oil and gas pipelines and emergency services and we are trusted by our customers to deliver solutions that meet their needs around the world.

As we develop digital radio systems and IP communications at the leading edge of current technology, we maintain our focus on customer needs.

Whether for day-to-day operations or for crisis situations, which demand a rapid and accurate response, our solutions are built around how people work best.

**Background**

Simoco have a well-defined software development process, based firmly on the well known V lifecycle model and certified to ISO 9001/TickIT. However, in an effort to further improve quality and reduce development costs, the company decided to review the area of software testing.

Findings indicated that bugs were being detected during system testing which, if detected earlier in the development lifecycle, could have been rectified more cost-effectively and easily. The logical conclusion was that the testing of code at earlier stages was not sufficiently rigorous and that a number of defects were being carried over to subsequent stages of testing. Having recognised the problem, Simoco decided to look for a tool to help formalise their approach to unit and integration testing, and to provide information on the quality of their code. After reviewing the commercially available tools, Cantata was chosen and made available for project use.

***“Cantata clearly picked up coding issues during module testing which would not have previously been discovered until system testing”***

**Cantata in Action**

The first major project that used Cantata was that of a large control room system for a major utility company. This communications system integrated digital telephony with mobile radio services, allowing reliable communications between the control room operators and staff in the field. Strict unit and integration testing with Cantata was specified in the quality plan.

**Early Findings**

Before the testing phase of the project began, a number of staff took part in a one-day Cantata training course that provided a basic understanding of the tool's operation. When testing began in earnest, it was quickly discovered that the flexible nature of Cantata allowed them to integrate the tool within their existing development environment, by creating a number of simple custom utilities which enhance the use of the product and promote the rapid development of test scripts.

The immediate benefit of using Cantata was the feedback of quantifiable quality information in the form of test coverage and code complexity measurements. A set of project-wide quality criteria were set for a selection of Cantata metrics; code was not allowed to be issued until these criteria were met.

During the early stages of testing, a variety of Cantata static analysis metrics were evaluated to see if a correlation could be established between code complexity and the number of problems experienced with a module.



## Why Unit and Integration Test?

Through this empirical process, the Simoco development team identified a group of metrics, including Hansen's Cyclomatic Number, as providing a good indication of whether or not a module was likely to have a larger than average number of defects. This information was used by the project as an indication of whether the code required further review or, in more extreme cases, a rewrite.

### Further Developments

As with all projects, the testing of the small proportion of large modules was inordinately labour intensive. In order to reduce the effort required, an additional utility was created which allowed the tester to take a test specification, in the form of a text file, and to create the Cantata test script from it automatically.

### Benefits

Having used Cantata extensively for unit and integration testing, the main benefits included a measurable increase in the quality of code produced, together with an improvement in the visibility of the testing achieved. Problems were isolated much more quickly and were located at their source, leading to reduced costs.

In the view of a Simoco spokesman: *"Cantata clearly picked up coding issues during module testing which would not previously had been discovered until system testing."* The project's findings were used to refine Simoco's overall development strategy.

### The Future

For future reference, a complete set of static metrics was collected for each module and was maintained with the code. Simoco performed a detailed analysis of this information at the end of the project to see if any further relationship between Cantata metrics and other process metrics, such as 'defect rate' and 'effort required', could be established.

The success achieved by the Simoco development team was monitored closely and it was suggested that Cantata be used on a number of forthcoming projects - including several major developments.

### Conclusion

Simoco regarded rigorous, formalised testing at all levels as a 'must'. Cantata was the preferred testing tool for achieving this, and it allowed them to produce high quality code whilst keeping costs in perspective.

Companies in the IT & Telco sector perform unit and integration tests to make their testing more efficient.

### Reduce Commercial Risk

- > Increase software quality by thorough unit testing to prevent impacts on corporate and brand reputation
- > Use state of the art testing to prevent against fitness for purpose litigation
- > Systems are too complex to thoroughly test, so they are decomposed into testable units



### Minimize Overall Testing Cost

- > Testing code earlier is cheaper (less re-work costs)
- > Most effective use of testing resources (unit tests do not have to wait for system builds)
- > Increases overall software quality (more thorough testing is possible at unit level)

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.