

Goal: A medium-sized enterprise plans the enhancement of its market position in a highly competitive market dominated by large providers.

Challenge: Object-oriented implementation of a series of existing network management solutions in order to allow for faster responses to customer and market requirements.

Selection of a development environment

- Based on an object-oriented approach
- Providing options for developing a flexible framework architecture and for using parameterized object classes – via meta-programming
- Able to fully connect to a database
- Allowing for easy GUI creation
- Providing code-generating features independent of the operating system

Solution: Cincom Smalltalk™

Results:

- Higher-than-average growth in a highly competitive market – 15 to 20 percent annually
- Increased productivity: development times reduced by a factor of 10
- Improved quality: error rates in software programming reduced to less than 30 percent
- Higher flexibility: options for quick responses to customer and market requirements
- Outstanding integration facilities: fast and smooth interface integration
- Higher profitability: discovering unused network resources

Everything You Always Wanted to Know About Your Network But Were Afraid to Ask



Oberhausen (Rhineland) based TCC R&D provides custom-tailored software solutions for managing networks and infrastructure. Customers of the company include corporations and numerous public services, local authorities, and medical facilities.

Network Service Management (NSM) tools monitor and provide security for all services that information and communication engineering provides. They also integrate network management in the ICT infrastructure management, thus linking logical and physical network management components.

The foundation for their tools is a component-based framework which can speedily be customized to customer-specific requirements via parameterization. TCC R&D customers quickly and easily get a comprehensive view of their telecom and IT infrastructures, which enables them to meet ever increasing compliance and documentation requirements, such as those specified in the IT Infrastructure Library (ITIL). Since the mid-nineties, Cincom Smalltalk has been used for all product development.

Network Governance – Intelligent Solutions for Secure Network and ICT Service Management

A number of regulations have recently been enacted that make information and telecommunication technology part of enterprise-wide risk management. According to the Corporate Sector Supervision and Transparency Act ("Gesetz zur Kontrolle und Transparenz im Unternehmensbereich," KonTraG), which was introduced in 1998, the entire documentation of ICT networks must be traceable. To comply with Basel II, lending regulations for banks must include provisions for the security and availability of ICT systems; similar provisions apply to publicly traded US companies under the Sarbanes-Oxley Act (SOX). International ISO 27001 standards include provisions for the ICT documentation management as well. On the one hand, companies face the challenge of meeting numerous compliance and documentation requirements, regardless of their size and legal structure. On the other hand, operating, monitoring, and controlling the ICT infrastructure must be economically justifiable, or even better, more profitable.

TCC R&D addresses precisely this conflict, using a series of intelligent network management solutions for different company sizes and application areas. These solutions allow for independence, transparency, profitability and, particularly, security for the operation of IT and telecom networks. Using a variety of interfaces to ERP, GIS, Facility Management, and office solutions, they integrate seamlessly into any existing IT environment.

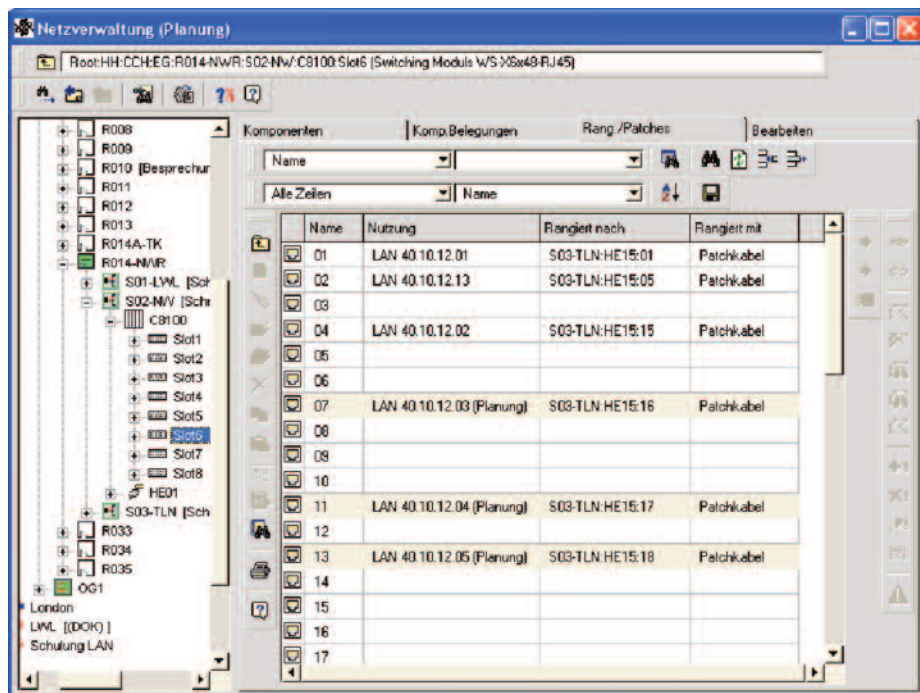
"In our company, technological understanding meets creative and innovative software development. Our early decision for object-oriented technologies pays off. For several years we have been growing faster than the market," Margit Steinmayr, CEO of TCC R&D GmbH, describes the company's current market position.

Cincom Smalltalk as the Foundation for Higher Flexibility and Broader Functionality

Sophisticated market- and customer-oriented solutions require comprehensive integration and fast implementation facilities at low cost. New techniques (such as VoIP) and increasingly lean organizations – combined with accelerating cost pressure and ever more complex networks – mean that the standards for network management are getting more and more demanding. That is why TCC R&D opted for the complete redesign of their software solutions, which had initially been written in COBOL. "Our goal was to empower users to design object classes via parameterization using the new software generation," Margit Steinmayr explains. "This seemed the only quick and successful way to make our software development ready for the new techniques." Plus, TCC R&D customers expect full release compatibility, i.e., new releases must be introduced quickly while still maintaining customer parameterization.

"Cincom Smalltalk is and will remain our central development environment in the near future."

– Margit Steinmayr, CEO, TCC R&D GmbH

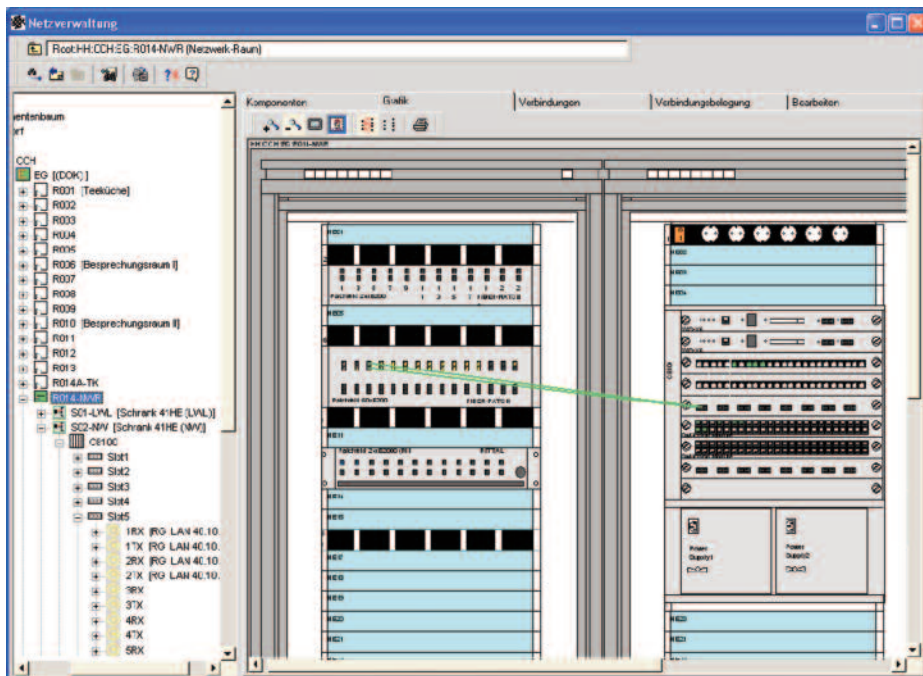


"Network Management" provides a tabular overview of the domain objects, in this case switch modules including all patching

In addition, a development tool was needed which would provide features for the quick realization of new solutions at low cost without affecting either the stability of the overall system or the existing functionality.

After evaluating available market solutions, TCC R&D chose Cincom Smalltalk. Cincom Smalltalk is a fully object-oriented platform for developing and operating portable multi-platform applications. "When we introduced Smalltalk as our development platform, the system handling presented absolutely no problem," Margit Steinmayr comments. "Language and handling of the development tools were fast and easy to learn." With respect to their advanced use of Smalltalk she explains, "Factors such as the availability of database connections for different formats, simple methods for desktop design, and code compatibility between different operating systems prove that we were right in choosing Smalltalk. An additional benefit is the database-supported release procedure which guarantees that only released packages are used. Comprehensive test procedures ensure that implemented modifications do not affect any existing functionalities."

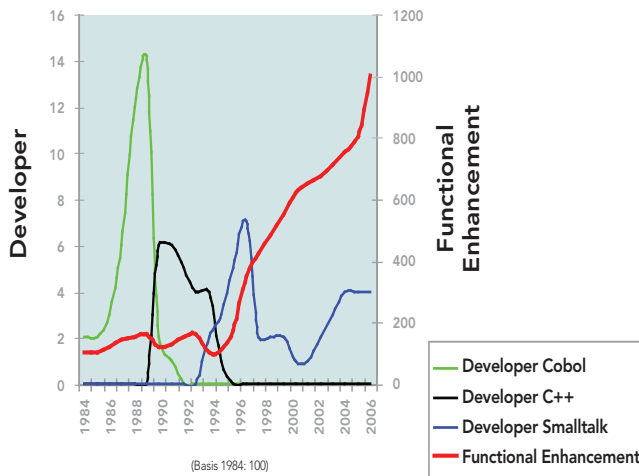
The Cincom Smalltalk re-factoring tools support the TCC R&D developer team in the reworking process of object modeling. This was particularly helpful at the beginning of the implementation because methodologies which had to be extracted from several application classes could be "extrapolated" to the framework layer. This layer is situated between the basic classes (Cincom Smalltalk, Object-Lens, etc.) and the application classes and provides models for the various class groups. This allows for smooth and seamless basic system enhancements, e.g., the implementation of a new database adapter, without the need to modify the application classes. With the framework functionality continuously improving, the application classes could be implemented quickly and securely. Unlike many other development environments, Cincom Smalltalk provides "metaprogramming" features which produce a generic framework structure. As a result, modifications can be realized much more easily and quickly, without affecting the existing software functionality.



Graphical representation of domain objects: Here control cabinets (see above), as well as network topologies or work flow representations

Increased Functionality, Improved Profitability and Flexibility, Fewer Errors

The targeted goals for the new implementation of TCC R&D software solutions – enhanced functionality and higher flexibility in response to changing customer and market requirements – were quickly achieved. By now the whole range of TCC R&D products is based on Smalltalk. “By consistently applying the rules of object-orientation, both the framework classes and the application classes have grown into a powerful development platform which allows for the quick implementation of even the most complex enhancements,” Margit Steinmayr concludes with satisfaction. “The Smalltalk community provides much basic functionality such as database adapters. Smalltalk has proved to be a highly effective and secure development platform. Initially we did not dare to hope that our solution would achieve such a tremendous functionality hub.” Steinmayr continues, “We can even store and retrieve parameterizations of domain objects. In the meantime, a specific community has emerged for whom we provide a platform for downloads and uploads (after our approval) of ‘customized classes’ on our internet site.”



Neither COBOL nor C++ accomplished what Smalltalk could do – significant and ongoing functional enhancements were not achieved until Smalltalk (and strict object orientation) were implemented.

Particularly when directly compared to the development systems of partnering companies, Cincom Smalltalk proves its productivity and performance. “In most cases, the implementation of interfaces requires customization or enhancements on both sides of the interface,” Margit Steinmayr explains. “Workshops for developers from different companies often showed that our Smalltalk code is typically up to ten times more effective than our partners’ code. Sometimes it is frustrating for our partners to realize that our interface function is immediately available after implementing just a few methods, whereas they need to program extensive new methods in order to achieve the same result,” Margit Steinmayr continues with a smile. Plus: An evaluation of service cases in the years 2004 to 2006 showed that less than 30 percent of the trouble tickets resulted from “real” software mistakes. The absolute number of problems was also pleasingly low.

Looking Into a Crystal Ball

As of today, the TCC R&D portfolio has reached a functional scope which covers all customer requirements. Of course, all modules are in a state of continuous enhancement. “We closely watch the market and are open to new requirements,” Margit Steinmayr sees her organization well prepared for the future. In addition to the client/server architecture, the network-service-management modules of TCC R&D will increasingly have to support web-based user desktops and web services under XML and SOAP. With Web-NSM the first step in this direction is completed; in the future all other NSM-Tools will be equipped with a web interface. In addition, the subject of Service Oriented Architecture (SOA) is gaining importance as a way of embedding the modules in existing tool environments such as IBM Tivoli, HP OpenView, or CA Unicenter.

