Top German University Modernises Administration Systems and Cuts Costs

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Axel Maurer, KIM Project Manager, University of Karlsruhe

German universities are facing a radical overhaul in organisational processes due to European harmonisation of higher education. The legacy IT system used by nine out of 10 institutions exacerbates this problem. Karlsruhe University used the Microsoft® .NET framework to develop a solution that uses Web services to build on existing systems, illustrating that universities can cut costs as they comply with European standards.

Business Needs
Karlsruhe University is Germany’s oldest technical university, initially founded as a Polytechnic College in 1825. Its 4,000 employees—of which 280 are professors—support teaching, research, and administration across 11 faculties. The university enjoys an excellent reputation—above all, in information technology.

Karlsruhe University holds top place in four out of the five categories used by the national university rating system: the status of its professors, research funding, IT infrastructure, and study environment. More than 18,000 students study 40 courses. In October 2006, it was voted one of the three elite German universities in the national Competition of Excellence. Together with the “Research Center Karlsruhe (FZK)” the university aims to create a world-class research institution based on a similar model used at MIT.

However, these aims must be complemented by radical changes in teaching and administration practices. In 1999, 29 countries signed the “Bologna Declaration” to create a common higher education space across Europe by 2010. With the introduction of uniform BA and MA courses, German universities must implement fundamental changes in course development and accreditation. Procedures between the departments and the administration must be re-organised and supported by integrated IT systems.

Nine out of 10 German universities face difficulties in meeting the challenges of the Bologna Declaration because of the legacy IT systems in place. The Hochschul-Informations-System (HIS) application suite is used by more than 90 per cent of higher education...
Institutions nationwide. At Karlsruhe University, it is used to maintain the electronic lecture index and manage lecture and examination administration processes.

Like many other users, Karlsruhe University has built on HIS over time and now has an awkward, piecemeal solution. Professor Wilfried Juling, Head of the University Computing Centre, Karlsruhe University, says: “Our existing system and processes are very inefficient. Because several university institutions have developed their own systems and databases over the years, delays and interruptions in information processing are common and work is often duplicated.”

Solution

In 2005, the university began the Karlsruhe Integrated Information Management (KIM) project—an extensive modernisation of its internal organisation. It represents a total investment of €3 million (U.S.$4 million) over five years, addressing process modelling, business processes, and the IT systems that support university administration.

The KIM steering group consists of academic and administrative representatives such as the faculty chairs of economic science and information technology, the university computing centre, the central administration office, and the library. Implementation is carried out by a dedicated KIM team responsible for developing a service-oriented architecture (SOA) and interfaces to the HIS and other programs using Web services. SOA describes an IT architecture that facilitates distributed computing environments with many different types of computing platforms and applications. Web services are one of the technologies that help make SOAs possible.

The university chose to use the Microsoft® .NET framework for the technical implementation of KIM. Axel Maurer, KIM Project Manager, University of Karlsruhe, says: “When it comes to Web services, .NET has the clear technological lead. In the Linux/Java area, there are no comparable approaches that are developed as far.”

By making early investments with .NET, Microsoft has helped provide the building blocks that help several organisations to implement SOAs successfully. One example is Web Services Enhancements—an add-on to the Microsoft .NET Framework that helps developers build better security features into Web services using the latest protocol specifications and standards.

Microsoft contributed personnel resources to the project and access to expert know-how in the form of free workshops. It has also offered to help the university disseminate KIM deliverables and share lessons learned using the Microsoft Shared Source Network, where universities can freely access these and other resources to help meet Bologna requirements.

Benefits

The university is already enjoying returns from the KIM project little more than a third into its lifetime. Already, it has:

- Given learners and teachers faster, easier access to vital information.
- Built on existing applications, maximising investment.
- Lowered energy bills in its biggest lecture theatres by 15 per cent.
- Shared its experiences with other universities throughout Germany.

The KIM solution has transformed learning and teaching activities across the university. Students can now produce study plans, request study work, book lectures, print out certificates, look at the complete curriculum, and find out what remains to be done—all online. Lecturers can book lecture theatres and view up-to-date information about their future lectures across the university without having to rely on paperwork and calls to administrators.

All this has been built using the university’s existing IT applications. Even though some are now several years old, they are fit for purpose so the university can plan its spending more effectively. Maurer says: “This has saved us considerable costs, yet we are at the latest technological level. Karlsruhe now plays a pioneering role in the German university landscape.”

The SOA approach has ensured that applications are platform-independent, reducing overall costs. Better-integrated data use is leading to more coherent business processes, improved data quality, and efficiency gains across the institution. Juling says: “More flexible IT structures are helping improve transparency, cost-efficiency, and administrative procedures.”

Already, the university has made significant cost savings. Maurer says: “Using the lecture planning system, we can now control the AC system and heating. This has lead to an energy saving of 15 per cent in the large lecture theatres.” What is more, other German universities can obtain information on the digital campus and download the new software solutions using SSN as a knowledge transfer network. Swantje Rosenboom-Lehmann, Head of the Research and Teaching Division, Microsoft Germany, says: “Without a first-class IT infrastructure, top-level services in teaching and research are virtually impossible today. KIM and SSN help German universities create a digital university landscape that will be internationally competitive.”