

## **Interview with Professor Dr Herbert Kopp on developments in computer science and the computer centre at OTH Regensburg**

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**1. Dear Professor Kopp, how did you come to come to Regensburg to study at what was then the University of Applied Sciences? At what stage of development was computer science when you started?**

After completing my doctorate under Prof Günter Hotz, who as founding chairman of the German Informatics Society played a major role in establishing computer science in Germany, I was involved in the development of multi-microprocessor architectures in the Central Research and Development department of Siemens AG, which were made up of many simple autonomous individual computers (up to 128) and could solve complex numerical tasks (weather forecasting).

In the winter semester of 1977, when I came to Regensburg, there were already computer science degree programmes at 13 German universities, including the University of Erlangen-Nuremberg and the Technical University of Munich in Bavaria. There were three computer science degree programmes at the Bavarian universities of applied sciences: Munich (since 1971), Regensburg (since 1973) and Augsburg (since 1975).

When the computer science degree programme was established in Regensburg in 1973, 24 students embarked on the experiment and successfully completed their studies in the summer semester of 1977.

In organisational terms, the Computer Science degree course was assigned to the Department of General Sciences, which until then had only offered basic lectures in mathematics, physics, chemistry, languages, etc. for the degree courses in the other departments.

Until then, there were no lecturers specialising in computer science in Regensburg. It is thanks to the dedicated support of lecturers with a related subject focus and lecturers from local companies as well as the university's computer centre that our computer science department survived the first few years.

In view of the completely inadequate resources, those who dared to try the experiment and got it through the start-up phase must be credited with a great deal of courage and perseverance. There are reports of collegial and committed cooperation across the boundaries of the departments. This was possible because group interests were not yet so pronounced in the newly founded university.

I have described the development of the degree programme from 1973 to 2013 in more detail in [1].

## **2. what were the most important stages of the data centre in your time?**

While well-equipped computer centres were set up at universities early on, this was completely neglected at universities of applied sciences for decades.

When I came to Regensburg in 1977, the IT landscape consisted of:

- a "ZUSE Z23 model 1961, which has been used since 1967 (!) for programming courses (in ALGOL 60) in the technical degree programmes.
- a Hewlett-Packard desktop computer for structural calculations.
- an "Interdata 6/16" process computer for computer science, which had been delivered but was not yet in operation. One of my first tasks alongside teaching was to get the system up and running and prepare it for use in computer science courses.

The spatial and personnel requirements for the operation of IT systems in the years after 1977 can only be described as a sequence of imaginative makeshift solutions. When PC workstations were introduced in the mid-1980s, an informal working group ("PC group") was formed, to which some departments seconded some of their own staff.

In 1993, a senate resolution prepared the organisational framework for a computer centre, which was to be responsible for IT matters. The fact that its responsibility was simultaneously limited to those matters "*which do not fall within the competence of other bodies, institutions, departments or laboratories of the university of applied sciences*" sheds light on its role in the university's internal battle for resources. In 2000, the State Ministry of Science, Research and the Arts was informed of this and asked to officially establish the computer centre as a central institution of the university.

The appointment of a technical manager in October 1992 marked the starting point for the establishment of a team to operate the IT systems, but brought no further improvement for many years, as a comparison from 1996 shows:

- Recommendation of the State Ministry from 1993 : 3 to 10 employees per university
- Average facilities at Bavarian universities of applied sciences: 1 MA per 900 students
- Bandwidth in Bavaria: 1 MA per 150 to 5300 students

- Regensburg University of Applied Sciences:  
students

1 MA per 5300

In 2008, after the library moved to a new building, the computer centre finally found a suitable base in the rooms that had become available as a result.

I would like to take this opportunity to mention some milestones in the development of the IT infrastructure at Regensburg University of Applied Sciences:

### **The Computer Investment Programme (CIP)**

The CIP was initiated in 1985 as part of the federal/state joint task of university construction funding (HBFG) with the aim of providing PC workstations for students across the board.

Although the administrative effort for the application was considerable and it usually took more than a year from application to deployment, the CIP programme was a reliable basis for financing student workstations for over 20 years. In total, over 800 workstations and the associated servers were procured for Regensburg University of Applied Sciences as part of the CIP programme by 2006.

### **Scientist workplaces (WAP)**

In 1987, the German Council of Science and Humanities recommended the establishment of scientist workplaces (WAP) at all universities. Due to a lack of state funding, the WAP programme in Bavaria was only launched after a delay of several years. In 1990, Regensburg University of Applied Sciences submitted the first WAP application from a university of applied sciences in Germany for review. In April 1992, the first 24 WAP computers were handed over to the professors. A total of around 380 workstations were realised as part of the WAP.

The effort involved in applying for WAP computers was significantly higher than for the CIP and the result of the DFG review was less predictable. Although WAP computers also took at least a year from application to procurement, the programme was a valuable help in financing this increasingly important tool for teaching staff.

### **Pilot project "Integration of students' own computers into the degree programme"**

In 1991-1993, a pilot project was carried out in the Computer Science degree programme with the aim of testing the integration of students' own computers into the course. In the process

an entire 4th semester study group was equipped with 74 computers. The pilot project confirmed the advantages of personal computer workstations many years before they became common practice:

- The students were able to work at home with the same tools and applications as in the CIP pools at the university.
- Their devices could be used daily, around the clock and without travelling or waiting times.
- The content of the degree programme could be taught more intensively and in a more practical way.

The students made a personal contribution of DM 3000 each in 3 instalments (40% of the system price). Students who could not easily afford this contribution were prioritised for employment as assistants.

### **Network infrastructure**

Parallel to the spread of decentralised computers, the development of an efficient network infrastructure (internal university network, access to the national science network and to external networks) was of great importance. The DFG's network memorandum provided the impetus in 1987. A "planning aid" was then drawn up at state level by 1990, and in 1992 we had the first funds available to implement our network infrastructure.

#### *The first generation of the network:*

As there were no companies with the necessary expertise at the time, the network could not be put out to tender and commissioned in the same way as a telephone network. It was therefore necessary to build up in-house expertise for the design of the network structure, the selection of active components, their configuration, commissioning and network management. Only the components and the laying of the network cables were put out to tender in co-operation with the University Building Office and awarded to specialist companies. At the beginning of the 1993/94 winter semester, the network went into operation at 3 locations with approx. 30 active components and approx. 500 connection points.

#### *The second generation of the network:*

The rapidly growing demands on the network infrastructure soon made it necessary to replace the network based on thinwire technology with a network based on fibre optic and twisted

pair technology. This took place between 1999 and 2005 for the new buildings (mechanical engineering, microsystems technology, library and cafeteria) that were constructed during this time, but also for the old locations. In 2005, the new network supplied approx. 2,800 connection points and 1,400 end systems. At the same time, the wired network was supplemented by a WLAN infrastructure with 66 access points between 2004 and 2007.

### **ICT services**

Around the year 2000, the provision of services for the business processes of Regensburg University of Applied Sciences became increasingly important. :

#### *Basic services*

These are based directly on the ICT infrastructure and are used by the application services above them. Most users are not aware of their existence. Some of them are mentioned here:

- Directory services/identity management
- DHCP and DNS server
- Firewall, virus protection, spam filter
- Data backup services
- Accounting services

#### *Application services*

These map the business processes of a university.

- The web server or intranet server, for example, are aimed at larger target groups.
- Library services or the eLearning platform are used to support teaching.
- Services in the area of university administration include student and examination administration, financial and resource management, travel expense accounting, etc.

A serious problem with the application services was and is the expectation of users that the services will map their structures, which have grown over decades, 1:1 in the software and are not prepared to think about a sensible restructuring and optimisation of their processes first.

### **3. would you tell us a positive experience and a negative event from this time?**

What I found particularly positive during this time was the extraordinary commitment and high level of expertise of the employees. Only because of this was it possible to set up and

operate the IT infrastructure at Regensburg University of Applied Sciences with such a small team. I would like to take this opportunity to express my special thanks to them. I have forgotten the negative events, which of course also occurred.

#### References

[1] H.Kopp [A short history of our computer science](#), Regensburg, 2013

[2] H.Kopp [The information and communication infrastructure of the University of Applied Sciences Regensburg](#)

in: Erich Kohnhäuser (ed.):

The Regensburg University of Applied Sciences from

1990 to 2006