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INFORMATION SYSTEMS ARCHITECTURES DEVELOPED FOR THE USE IN THE WIDE  
NETWORK OF VSB-TU OSTRAVA

ARCHITEKTURY INFORMAČNÍCH SYSTÉMŮ VYTVOŘENÉ PRO POUŽITÍ V ROZLEHLÉ  
SÍTI VŠB-TU OSTRAVA

**Abstract**

This contribution describes information systems architectures developed at the Department of Control Systems and Instrumentation, VŠB-TU Ostrava during the last fifteen years. Most of them are focused on supporting the teaching process and related information systems, like • Department Accountancy Information System, • Technical Conference Information System, • Publications Record System, • Subject Context Registration and Thesis Registration. Specialised software systems had to be developed to solve data distribution, synchronization and backup for the reason of a very complicated network structure.

**Abstrakt**

Příspěvek popisuje architektury informačních systémů vyvinuté na Katedře automatizační techniky a řízení, VŠB-TU Ostrava v průběhu posledních patnácti let. Většina z nich je zaměřena na podporu výukového procesu a související problémy, jako • Systém podpory hospodaření pracoviště, • Systém pro organizaci odborných konferencí, • Evidence publikační činnosti, • Evidence obsahů předmětů a Evidence závěrečných prací. Vzhledem k velmi složité struktuře a rozlehlosti počítačové sítě školy bylo nutno vyvinout speciální postupy distribuce dat, jejich zálohování a synchronizace.

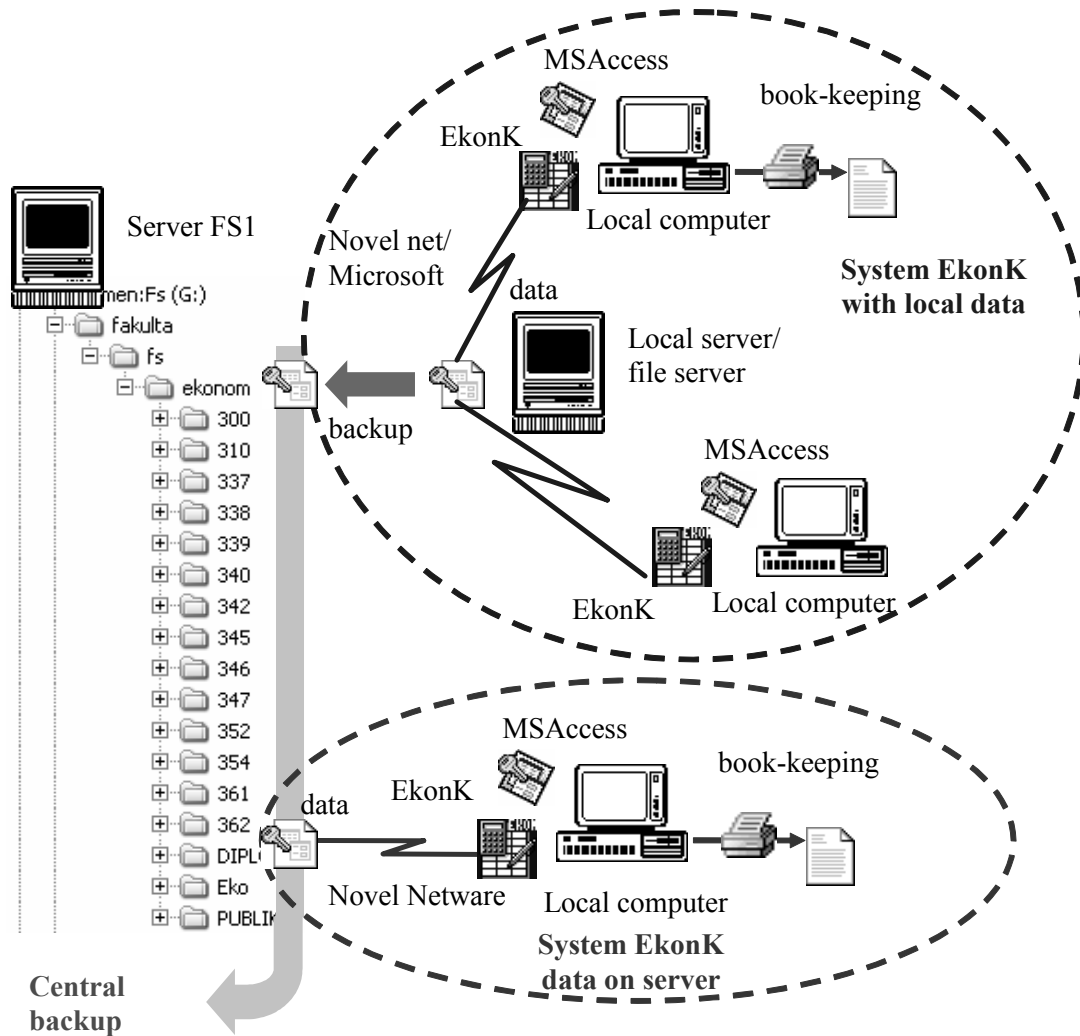
**1 INTRODUCTION**

Microsoft Access database system has been used for developing all department information systems. Together with its development process all presented information systems have been changed, based on technological possibilities. Very soon the presented systems will be made also accessible from the Internet. Microsoft technologies based on IDC/HTX and ASP have been used for the last seven years of these systems life. Most of them are now over-worked with the help of Microsoft .NET technology. The situation known from the previous Microsoft technologies is also repeated with this technology. A new version prepared for this year brings a completely new approach to information system development and enforces the completed readjustment of all developed systems.

For this reason the contribution is focused on the results of data analysis, developed algorithms and procedures. Some of them have been forced by the complicated situation in the university network, especially by the accountancy information system, which is distributed to many parts inside the university network. Data synchronization methods, developed for this application, have been used as a background for more other information systems oriented on industrial applications, management support systems working in similar complicated cooperation structures [1].

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**Fig. 1** Accountancy Information System Structure

The most complicated structure presents the Accountancy Information System, which has been developed to support the daily work of the department secretary, assistant and head of the department. It was unable to build a centralised system because of its insufficient efficiency, low network speed and many problems with data loss on some network elements [2].

Separate databases have been used to store department data. This strategy allows us to distribute these files to local servers and operate them in local network parts and overcome the problems with some network elements. This solution brings some new problems; one of them is the distribution of new database versions, when the system administrator did not know the separate database locations. This problem has been solved by developing a special procedure checking the database structure and correcting it according to the newest version. This procedure has been included in the client database, which has been distributed off-line to all users and is also stored in the system folder (Eko), see Fig. 1. System security has been guaranteed by use of some system account used by the procedure independent on the standard user account.

Another problem is the collection of all data for the faculty use. After the first two years of the system use it has been discovered that faculty representatives cannot exploit this data because of their

huge quantity and we resigned from collecting them [3]. Despite this, shared folders, shown in Fig. 1 have been used for the data backup of separate department databases. Automatically backup of these folders is made as a part of periodic server backup.

Fig. 2 shows the system structure of a technical conference information system, which has been in use since 1995 and is still expanding. You can see the very complicated structure given by the use of many different communication channels including personal, phone and fax communication. The most powerful technology used in this system is the web-oriented client support. Thanks to university network improvement, the central database based on a Microsoft SQL server could be used to simplify the system structure [4].

Thanks to the world-wide participation on our conferences, data come to the database all day and night. The database replication system that has been used does not lose this valuable data. The first replication system based on MS-Access 2.0 database has been developed by the author. Fortunately the replication system support has been included to the next MS-Access database version and is also a standard service of MS-SQL server. Now it is very easy to replicate all data to more different places, which helps to backup all data and allows operating locally stored data very fast.

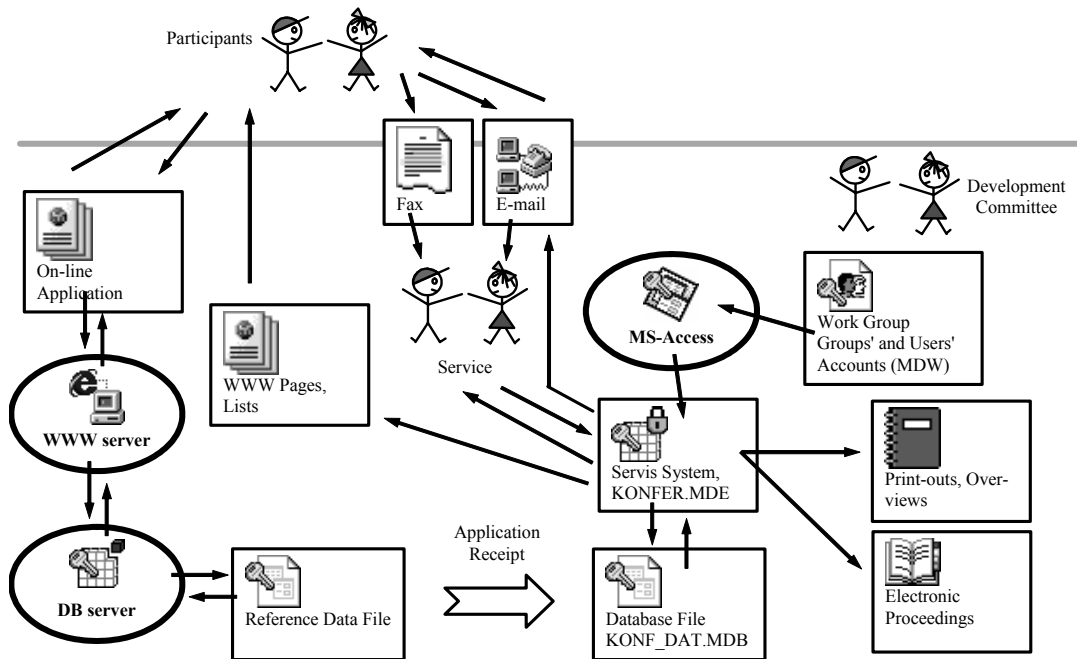


Fig. 2 Technical Conference Information System Structure

## 2 STATISTICAL ANALYSIS SUPPORT

Some statistical data have been included to present the real consumption of presented information systems. The authors of web based information systems are often uncertain about the system exploitation. All presented systems have been provided with statistical tools to evaluate their efficiency, this data can also show problematic network elements, can be used as basic information for hardware project.

Fig. 3 shows an example of collected data and the use of the conference information system during the conference arrangement time. You can see the extreme number of accesses responsive to the conference deadlines, such as the abstract deadline, paper deadline and registration deadline.

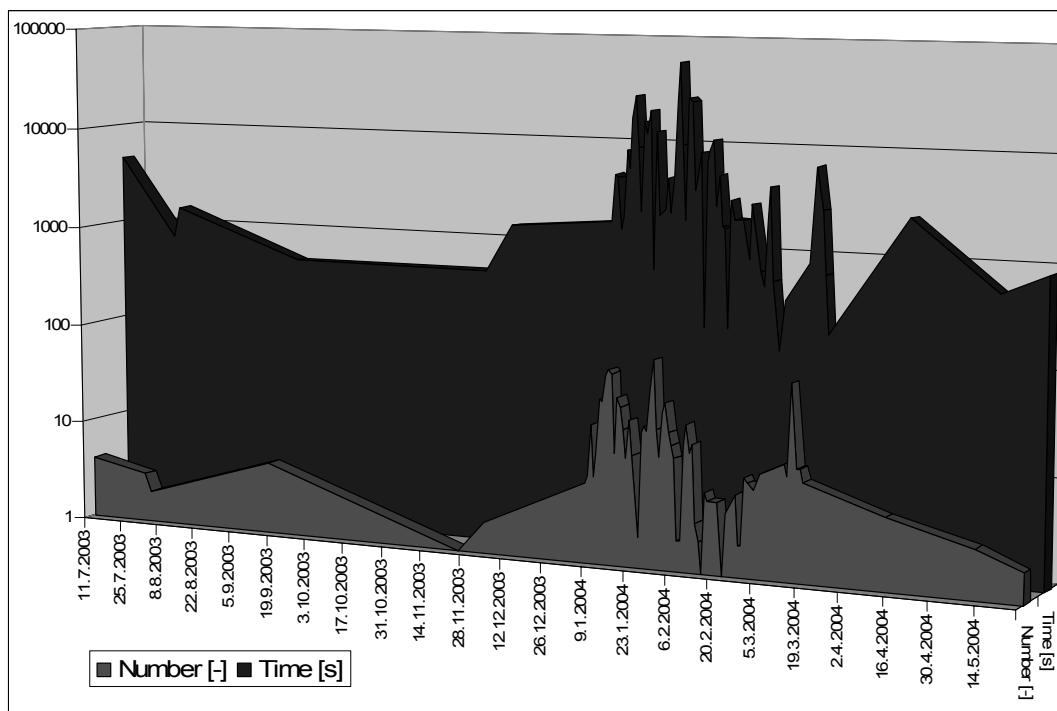


Fig. 3 Technical Conference Information System Access

### 3 CONCLUSIONS

This contribution has shown some important information structures developed at the Department of Control Systems and Instrumentation, Faculty of Mechanical Engineering, VŠB – Technical University of Ostrava in solving the main problems, like department and faculty economic activities or arranging technical conference.

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**Reviewer:** prof. Dr. RNDr. Lubomír Smutný, VŠB-Technical University of Ostrava