Fully integrated business software and its impact on German universities

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Abstract: *German universities are undergoing major structural changes since the mid 90ies. In this process fully integrated business software has become one of the main tools to improve the management capabilities of the higher education sector. However, the transformation process has turned out to be stony and a lot of conflicts had to be solved in a minimum of time, driving the institutions sometimes to the edge of their capacity. The presentation is going to show the impact of using a fully integrated business software on the universities (business processes, organisational structure, information system) and will give an outlook on what has to be expected as the next steps in the transformation process, which is still under way.*

Preface

The German higher education & research (HE&R) -sector has been changing very fast over the past years. This dynamic came quite unexpected as the universities were seen as a kind of static institutions, unable to move to modern structures and administration, as they had demonstrated the decades before. Now, the implementation of fully integrated ERP (Enterprise Recourse Planning) systems is spreading among universities - very often pushed by the government - and reorganisation, new it-based information systems and decentralised budget responsibility have contributed significantly to an improved management capability of German universities.

This paper is going to focus on the impact, implementing fully integrated business software had on the universities. The development at the University of Würzburg will be presented as example. Finally an outlook on what has to be expected in the mid-term will be given, pointing out the next steps of this transformation process, which is still under way.

Historical Background: Paving the way for ERP-systems in the German HE&R sector

Until the mid 90ies German universities had been characterised by a static structure, based upon governmental financing, a lack of competition and an old-fashioned legal framework. Since then, the HE&R-sector underwent major structural changes and the resulting movement is still gaining dynamic, being far from finished. This development had been initialised mainly by two factors:

- Growing international competition among universities put pressure on the German education system as a whole. New - Anglo-Saxon - products like for example the MBA swept wavelike over the HE&R-sector enhancing significantly the product portfolio of German universities.
- New accounting rules in some of the "Länder" - the federal states - had led to a switch from the old public accounting system - the so-called "Kameralistik" - to commercial accounting in the universities.

The latter was combined with a new budgeting system, which supplies a global budget to the institutions, in order to lead to a more efficient usage of the provided funds. This strategy was viewed as a possible solution to put an end to the financial weakening of the HE&R-sector that had been going on for years.

As a result, a lot of universities were looking for new administrative structures and the application of business administration tools in their institutions. Controlling finally could be introduced to university administration, after two attempts had failed since the early 70ies. Therefore information demand increased - not only from within the institutions, but also from outside - and this demand had to be satisfied by the administrative body.

Changing universities

Due to the facts mentioned above, universities and ministries involved at the level of the federal states were looking for new strategies in order to improve the capacity to act of the HE&R-system. In line with the concepts of New Public Management, Lean Management and an increasing tendency to decentralise budget responsibility, transforming universities in independent public enterprises or at least giving them more responsibility and allow them to act on their own, was seen as a possible way out to this dilemma in the mid 90ies.

Starting with three universities in Lower Saxony, ERP-systems found their way into the German universities. Since then, some of the "Länder" decreed top down the change of the accounting system for the HE&R institutions, sweetening this decision by financing a big part of the implementation costs of the ERP-system. Lower Saxony opted first for BaaN, introducing it at the so-called "Fachhochschulen" (Universities of applied science), revising this decision later on when the government felt the opposition to this choice. Since 2001 the rest of the universities in Lower Saxony make use of SAP R/3. This turnaround was influenced by the good experiences of the universities in Hesse. The Hesse government had decided to use SAP R/3 in the universities in 1999, going live in two steps. The first group of pilots went live in the beginning of 2000, the rest followed in 2001. At this moment, the government of Baden-Württemberg is trying to

convince its HE&R-sector that SAP is a good choice for preparing the universities for what is expected to come. The federal states of Hamburg and Berlin are also on the way.

It is interesting to notice that the universities very often had a kind of a pilot function for the rest of the administration in this states. This happened for instance in Hesse, where the decision in favour of SAP was taken only after the successful implementation at the universities.

But there is a second group of universities using fully integrated ERP-systems. Universities, which decided to implement ERP-systems even without being driven by external changes, as for instance a switch of the accounting system. The "intrinsic" motivation of this - smaller - group of universities was mainly based on their understanding that management capabilities had to be improved significantly in order to face the expected development of the HE&R-sector.[1] Among this group the universities of Würzburg, Heidelberg or - more recently - the TU Munich can be found.

The self-understanding of the universities is - partly - changing. Customer centricity is becoming stronger as competition tends to increase among universities and some of the institutions see themselves as public companies, fighting for budgets as well as for clients. In this context the administrative body gains importance as a service provider and management seeks for new tools to support the movement from the old passive management to a modern active management of the university.

The impact of the transformation process

The impact of such a transformation process and a switch to fully integrated ERP-systems had been underestimated by most of the players. The move from the heterogeneous it-systems to the integrated ones put a lot of - sometimes unwanted - reform pressure on the institutions, as integration demands for compatible, unified structures, not allowing for the inconsistencies, which had been developed in the former separated systems. A kind of a Pandora's box had been opened, and once done so, the institutions had to face the emerging conflicts.[1]

Impact on the business processes

Of course most of the participants knew that business processes had to be reorganised when the choice for integrated ERP-systems was made. But the complexity of the processes, the impact of the legal framework and the inertia of a public body not trained on process reengineering, set certain limits to the transformation process. Realising this conditions, some of the institutions - sometimes unknowingly - opted for Thome's model of continuous process reengineering: get started first and then increase your scale, permanently improving your processes.[3]

Impact on the organisational structures

Very often the implementation of the ERP-systems had a major influence on the organisational structure of the university. The different hierarchies found at the level of the distinct operational systems were not adequate to be transported directly into the ERP-system. Structural inconsistencies, like for example treating organisational units the same way as specially granted research funds, had to be taken out, when on the other hand in fact existing organisational units had to be added, even not being part of the official organisational hierarchy coming from the ministry. Universities had to learn that active management needed a complete and consistent structure in order assure the necessary data for the management information system.

What put pressure on the universities was the fact that the formerly existing hierarchies had been build up by the different departments of the administrative body. And every department had its special point of view on the university, mapping the organisational structure with its own interests.

Additionally the organisational structure of German universities is very complex. Due to the high degree of independence guaranteed to faculties, institutes and chairs, a kind of a hybrid structure characterise the universities today, where the different organisational bodies are connected only by the existing commissions, but no effective "top-down hierarchy can be found.

The conflict resulting from this integration process had to be solved first, as the organisational structure forms very often a turntable linking the different parts of the ERP-system. However, once solved this conflicts, a clear, complete and consistent organisational structure has become an important piece in the integration concept of the universities.

Impact on the information system

By changing their entire it-structure, universities opened the way for modern information systems as well. Thanks to integration - if worked out properly - a new dimension for the information supply could be reached. This had become necessary due to the increasing information demand inside the university (as well at the management level of the institution as for the faculties), but also from outside, as ministries, legislative bodies and potential clients required a better information supply. Quality requests rose and information had to be made available in time.

The fully integrated systems enabled the universities to build up proper information systems, including the necessary structures for a well-working controlling, even with the existing limitations faced on the budget, i.e. staff level. [Haneke, 2000]

The new information systems helped to shed some light on the "production process" in the universities, which had been a black box so far. Surprisingly the gain in transparency turned out to be a problem. Not only the structures and hierarchies became more visible, but also entire business processes, formerly veiled by media-breaks and the involvement of various departments. Those inefficiencies suddenly were at hand and management had do react. On the other side, the management also became aware that fully integrated systems lead to more transparency on all levels and not just for the top level.

Many users outside the administration feared that the detailed information, for example on their expenditure behaviour, could be used against them in the next budget negotiations, overseeing sometimes that this information had always been available, however at higher cost of access, because an employee had to dig in the already existing operative systems. A common ground had to be found in order to ensure acceptance of the ERP-system and to demonstrate that everyone is better of when the university is running a modern ERP-system.

Modern Administration in the HE&R-sector: The University Würzburg

In 1997 the University Würzburg started a project aiming at the implementation of an ERP-system based on SAP R/3. By that time, it

1 This is sometimes referred to as the "curse of integration". [2]

was the most ambitious project, seeking for a full integrated system not only focusing on accounting, controlling and materials management, but also on human resources and on the core business of universities: the training of students and the administration of the needed events, offered by the chairs. The project was looking for an it-based event management with full integration to the other operative applications.

Additionally MUCK, as the project was titled, included the implementation of self-service applications for the students and the development of a secure access system based on a smart-card solution.[2]The project was co-financed by the DFG and the Bavarian Ministry of Science.

As on average 70% of overall costs of the university result from expenses for personnel, as the main asset of a university is represented by its knowledge pool and as the production process at the university can - in most cases - be described as a knowledge transfer, the human resource management became the main focus in Würzburg.

MUCK caught a lot of attention due to the different starting point and due to the fact that the project made for the first time worldwide use of the - until then hidden and almost unnoticed - training and event management module in the SAP R/3 system, to administer the universities events in an fully integrated way.

Additionally this strategy opened the way for an active human resource development, leading to a training concept for the staff in order to ensure:

- Fulfilment of the legal requirements regarding special functions, like for example employees being in charge to take care of the security regulations when handling with radioactive substances. Integration with human resource administration enables the university to work out a proper planning with a refreshment scheme and training of possible successors.
- The Knowledge level of the staff and its development can now be administrated more effectively. As the wedge between salaries in public sector and the rest of the economy tends to widen, the development of internal human capital gains importance.

Besides the aspects of human resource or event management, other modules of SAP's ERP-system have been implemented and are partially live in Würzburg. The modules funds management, as well as the materials management and an R/3-based EIS (Executive Information System) are being used. For the latter import routines for data coming from other than R/3-applications were also developed, aiming at a complete picture of the university as a company in the management information system.

The problem resulting from the "curse of integration" also appeared in Würzburg. Departments, seeing themselves as the "owner" of a certain pool of data, had to learn that with integration some walls had come down and that in fact there was no kind of "ownership". On contrary, departments had to internalise that it is important to ensure data availability for the others in order to avoid double-work, redundant data bases and to make work more effective, using the existing resources (being money or staff) in an efficient way.

The conflicts regarding the integration of different hierarchy-schemes developed over years in the departments, had to be solved as well, sometimes by a top-down decision.

But as the dust settles, the positive aspects of integration become more visible and sensible, facilitating the daily work of the employees. The university today is much better prepared to face the expected developments of the HE&R-sector. The improved information basis led to shorter reaction times for the management and ensured a solid platform decisions can be taken on.

What has to be expected? A brief outlook

The transformation process is far from being finished. After the first steps taken towards modernisation, the ERP-systems have to be established first. Most universities went live only this year or the year before. Therefor after the "normal" problems, when introducing such a powerful and complex new ERP-system to a company, have been solved and the implementations have been rounded off during its productive use, universities probably will - sooner or later - enlarge their systems. There are two possible directions for this enlargement, although both can/will be taken. It is just a question of priority and also of product availability.

Universities already running ERP-systems will no longer be satisfied by using the systems just for their administrative processes, but trying to include also the processes resulting from their core business. Today the universities encounter a certain lack of products here. SAP is still working on its new module for the HE&R-sector, which is called Campus Management. But the complexity of the processes involved - underestimated by SAP itself - led to various postponements. The market, however, seems to be ready for such an industry solution and it will only be a matter of time and availability that the core processes will be included in the existing ERP-systems. Würzburg has already shown the positive effects of this integration.

The second way of expanding the ERP-systems in universities is a direct result of the limitations of the fully integrated systems, although this sounds paradox. Universities will be confronted with the limits of the ERP-reporting-systems the same way, other companies had run into this dead end. Full integration does not open every possibility to structure and analyse your data. In order to satisfy the information demand, which is likely to increase further, as information offered very often works as an accelerator for an even higher information demand, new tools will have to be introduced. Business intelligence tools like the Data Warehouse technology will find their way into the universities and this movement is in some federal states already on its way. The Bavarian CEUS-project aims at the implementation of Data Warehouses in every university in this state.[4]

Final Remarks

It should be reminded that more universities will follow the ones mentioned above. The train has already left the station and even if for the time being many universities do not want ERP-systems, mostly because they think those systems are much too complex, too expensive and not proper for the HE&R-sector, the near future will show that institutions using ERP-systems are prepared better for the requirements to come. However, the division between those, who work with fully integrated business software and those who don't, is likely to continue, as the switch to an ERP-system depends partly from the governments of the federal states by offering the appropriate incentives. This is true for the financial aspect, but also for the legal framework.

The German HE&R-sector is changing very fast at the moment. The process not only led to a modernisation of the it-structure of the universities, but also to a new level of co-operation among the institutions. In Hesse, the universities developed together a reference model to be used in all institutions in this state. The interaction among the universities running SAP R/3 had been pushed by the foundation of a special user group: the HERUG.DS (Higher Education & Research User Group - Deutschsprachig), where more than

2 MUCK stands as an acronym for "Multifunktionale Universitäts-Chipkarte". More information can be found under http://www.zv.uni-wuerzburg.de/muck/muck-sap.htm.

45 institutions of the HE&R sector, which use SAP R/3 for their administration, joined to improve their competitive edge through the synergy-effects of such an user group. As Germany is one of the fastest growing markets for SAP in the HE&R-sector, the HERUG.DS has soon become a bigger institution than its international counterpart the HERUG.

The 21st century will see universities being run as companies by a professional management based upon a proper it-structure. The first steps have already been taken and it is likely that German universities are ready and willing to take the next ones.

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