

# Cost-Benefit Analysis for the Selection, Migration, and Operation of a Campus Management System

Universities today face a number of challenges and problems on a global scale, but especially in Europe, due to both the Bologna Process and increasing numbers of students. Efficient, integrated campus management systems are professional, supportive information systems that represent a partial solution. Universities must act economically, which means that alternative systems must also be investigated and compared with regard to their cost-effectiveness. A cost-benefit analysis of selected campus management systems is presented in this paper. The goal is to provide IT experts and decision makers at universities with guidelines for investigating the cost-effectiveness of campus management systems.

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## 1 Challenges Facing Universities

Universities are facing a variety of challenges, both on international and national levels. This is especially valid in Europe due to the Bologna Reform and to

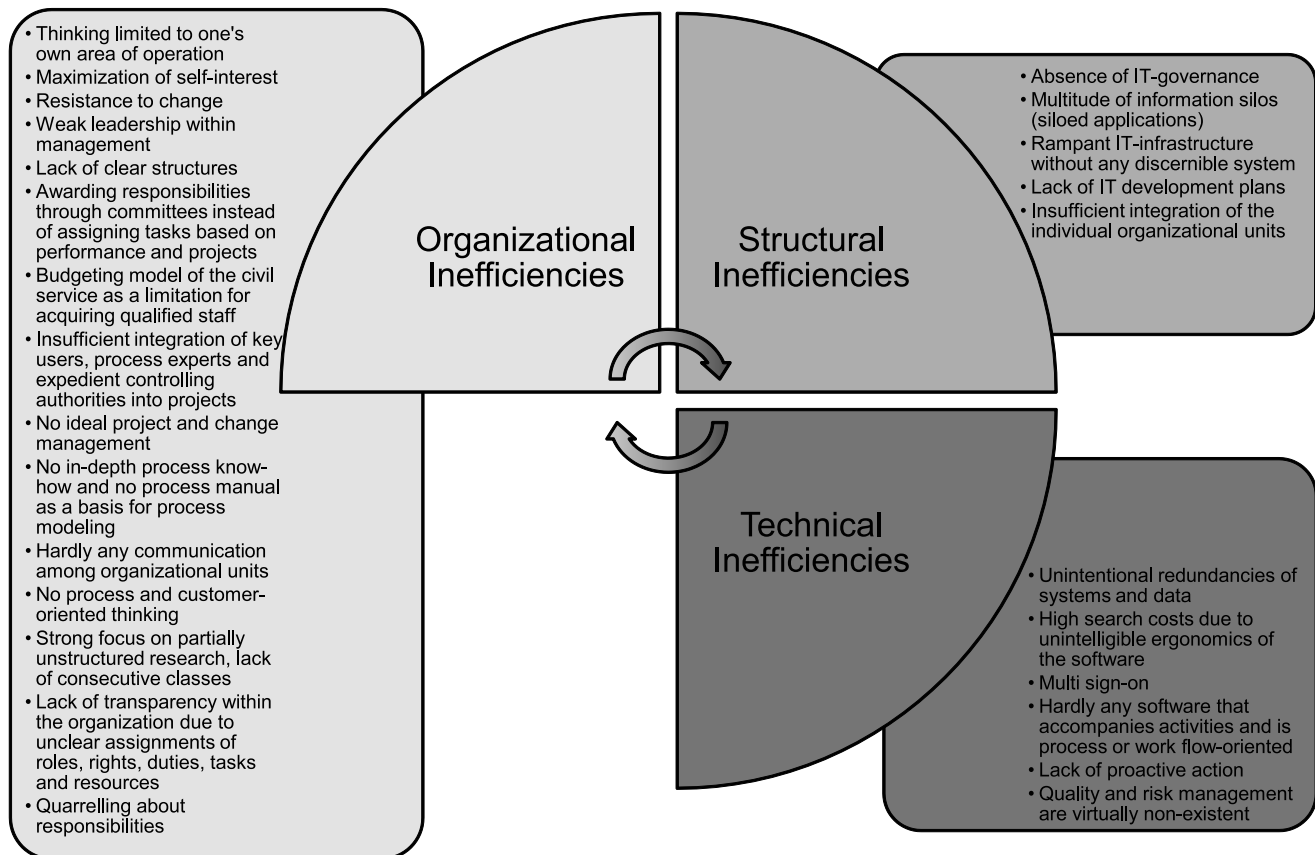
the increasing numbers of students (Konsortium Bildungsberichterstattung 2006, p. 121; Statistisches Bundesamt 2008, pp. 15–19). Changes resulting from the Bologna Process are also having an effect outside of Europe (Crosier et al. 2007, p. 10) and are being followed with interest elsewhere (Zgaga 2006, pp. 12 ff). For example, Asia is looking at the extent to which the Bologna Process can be transferred to the educational system there (BMBF 2008). The erstwhile goal of creating a common European university area by 2010 seems to have failed in part (Stegemann 2007). In pursuing this goal, inefficiencies in historically growing structures are continuing to be broken down (Dohmen and Günzel 2007, p. 6). As part of the study “Cost-Efficiency Analysis of Selected Campus Management Systems as a Task of TU9” (called TU9 Report in the following, Breitner et al. 2008), associated inefficiencies were revealed (Fig. 1). The focus of this study, which was the task given by nine technical universities in the summer of 2007, was three campus management systems (CMS) chosen as part of a previous market analysis (TU9 2007). The goal was to check the cost-effectiveness of the CMS and compare the systems with one another, using two universities as reference (Technical University of Munich and the Leibniz University of Hanover).

In current discussions, in addition to the classic expectations (excellence in research and instruction), supportive measures, such as customer-oriented services and service offerings are increasingly gaining in significance. These are

being demanded by the students as paying “customers”, who expect, as a return service for the tuition they are paying, an immediate improvement in studying conditions, for example in their courses and in administrative processes (Pfeiffer et al. 2007, pp. 52 f).

Campus management includes all relevant, administrative-intensive areas across the entire academic cycle (Fig. 2) that students go through during their studies, including those that take place before and after their actual time at university. This means that campus management begins when prospective students receive information about the university, and continues through the application process, allocation of places, matriculation and course planning, as well as organization of exams, checking academic performance and alumni administration (Janneck et al. 2009, p. 453).

Efficient design of these processes can be made more difficult by mature IT structures already in place. The IT structures are often comprised of isolated applications (Böhm et al. 2007, pp. 11 ff) and a service-oriented administration of IT is often insufficient (Wild 2008, pp. 155–163). In order to be able to adequately deal with these challenges with a level of resources that is not increasing, universities require professional support from information technology (Böhm et al. 2007; Brune et al. 2009, pp. 483 f; Deegenhardt et al. 2009, p. 463; Ederleh 2003; Weber 1996, pp. 32 ff). An integrated CMS can provide this support to a large extent, and the structural and organizational changes that come with the CMS can lead to an increase in efficiency and effectiveness in the universities.



**Fig. 1** Identified system-based inefficiencies at universities

A CMS is seen as an instrument to support business processes in both a course of studies and in the courses themselves (TU9 2007). It indicates IT-supported coordination of organizational processes and optimized workflows of a process bundle for campus management in an academic cycle. These include the mostly digitalized and automated application, admission and registration processes for new students, for example. Other examples include constitutive characteristics such as Web-based exam registration, grade recording and performance documentation, booking rooms and reservations for events, including automatic place assignment when there is a limit to the number of participants allowed. CMS also enables fee and tuition management, as well as evaluation of courses and delivery of official statistics. Beyond that, CMS provides digital student files and Web-based options for self-administration by students (master data maintenance, status display, progress checks). In this way, a CMS can contribute toward reducing inefficiency due to manual processing and repetitive tasks, as well as media disruptions. The integrated data storage of

a CMS helps connect the process worlds of central university administration, faculties and institutions.

## 2 Procedure Model for Determining the Cost-Effectiveness of Campus Management Systems

A university's basis for action, which also applies to the use of an IT system, is focusing on cost effectiveness. In German universities, this does not depend on any special public law status (BHO 2009, §7). It is also important to act economically in order to position oneself successfully within the international arena of universities (Janetzke 2001, p. 6; Klug 2009, p. 473; Pfeiffer et al. 2007, pp. 9 and 25 ff). Thus many universities have to decide whether to modernize existing systems or discard them (Sneed 2003, p. 599). With regard to the introduction and migration of a CMS, which is seen as a large IT project, a cost-effectiveness analysis of the alternative systems must be performed as part of a pre-project

phase (Zarnekow et al. 2004, p. 181), because introducing such a system comes with high costs (Bensberg 2009, p. 493). On the basis of and expanding upon the procedure model for the software selection process according to Ahlemann (2004, pp. 63 ff), a cost-benefit analysis should be performed based on the definition of requirements, a rough selection and a pre-selection, as explained above. The goal is to forecast the success of future investments in the alternative systems and to analyze them in relation to one another (Ney et al. 2006, p. 16).

The term "cost-effectiveness" describes the relationship between total costs and total utility, but it distinguishes between monetarily assessable uses; quantifiable, but not monetarily assessable uses; and non-quantifiable uses (Kloock et al. 2008, pp. 68 f; Krcmar 2005, pp. 404 ff). Based on the TCO approach (Elram and Siferd 1989; Wild and Herges 2000, pp. 9–16), direct and indirect costs both need to be determined. The assessment of costs has been solved to a great extent in the research, but the assessment of benefit still represents a challenge (Milis and Mercken 2004; Pietsch 2003, p. 37). In sci-