

A MODULAR SYSTEM FOR THE SUCCESSFUL IMPLEMENTATION OF IT-BASED CAMPUS MANAGEMENT SYSTEMS

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1. EXECUTIVE SUMMARY

To manage the profound restructuring process associated with the Bologna-process, many universities refer to the support of high-performance IT-based campus management systems. Often the fact is overlooked, though, that the implementation of IT itself constitutes a complex process of change. The supply of appropriate software does not automatically provide for its efficient use through different actors. The complexity of the change process results from the simultaneous involvement not only of the administration but also of the academic sector. Objectives and interests of both groups differ strongly.

The authors present an approach for a change management process facilitating a successful implementation of an IT-based campus management system. The approach is composed of ten modules adapted to university requirements. The modular system is the result of aggregated experience from multiple consulting projects accompanying the implementation of campus management systems. Among the central components are an early and flexible planning of the change process, strength and weakness analysis of current processes and a continuous process control integrating all involved actors.

Much importance is attached to the fact that the mere adaptation of separate elements is not sufficient. The modules have to be combined to form a compatible and adequate implementation concept for campus management systems. The ten elements can easily be adapted to specific requirements and conditions of different universities. The authors' expertise from consulting projects clearly shows that only an individual adjustment of the change process will make the IT-system's benefits unfold to the full extent. The professional project management's responsibility is to keep track of the whole change process and to focus on different modules in accordance with the specific level of project maturity and current requirements.

2. Reorganization of the campus management system initiated by Bologna

Restructuring of teaching and studies as well as the introduction of global budgets are requiring innovative instruments at the top management level to control the university as a whole. However, at the operational level of the administration new university-wide networked structures are required which need an efficient technology of information and communication. Given extended technical possibilities and stagnating university resources, an increasing number of activities are carried out with IT support (Cloes, Meyer & Gilch 2005). Thereby the academic staff and the students are more and more actively involved into process operations through web based self service functionalities. The introduction of new information and communication technologies in the universities organization and processes aims at moderating the additional requirements created by the Bologna process to all parties concerned.

It is often disregarded or underestimated in the context of campus management systems that the introduction of IT represents a change process by itself and is much more than a purely technical operation (Bauer, Bartels & Gilch 2006). Therefore it is often assumed that by providing IT the efficient use through the respective target groups takes place in terms of a self-automatism.

This expectation is often foiled by the change processes which are initiated during bad structured IT implementation processes in universities. In practice, it becomes clear that linear and causal models are not sufficient explanations for these change processes. In accordance with systemic approaches we rather have to assume, that change processes can be described by interaction, supplementing processes and mutual influences that illustrate the interaction of the different elements within the system and its relations to the system environment (Ellebracht, Lenz, Osterhold & Schäfer 2003). Universities as organic systems are characterized by interests, relationships in the organization and relations to the involved environment. Operational experience deduces that in consultancy a balance between these different levels has to be established. The organization of the subsystems and their internal and external networking should be strengthened in order to improve the communication and cooperation relations and to encourage better teamwork structures within the organization. IT implementations require an accompanying change management process that guarantees an effective and purposeful outcome. Campus management system implementations regularly produce considerable resistance, delay and denial and it is not easy to create acceptance for such projects.

It is important to take these unfavorable conditions into regard, to respond to them and to embed the whole university constructively into the reorganization and re-design process by intensive information and communication. With experiences from extensive reorganization and change projects in the context of the Bologna Process, the authors have developed the idealized process "Change Parcours" that systematically shows the relevant phases of such a reorganization project (Bauer & Gilch 2007). The tool helps the universities to identify stages of change, to manage the change process and to involve all actors into the project.

In this article the lessons learned during long-time practical consulting are condensed to an archetype concept. Taking into account the elements below, a positive welcome and an effective use of the implemented campus management system should be ensured for the majority of the participating users. In contrast to the process-oriented project management reference model PRINCE2 (Projects in controlled Environments) that is being widely used in the IT sector and that enjoys the status of a de facto standard in Great Britain (Hedeman, Fredriksz & van Heem, 2006), the model depicted below especially focuses on the social process during the implementation of campus management systems. This approach goes beyond the conventional phase-dependent management, organization and documentation of an IT project. Apart from primarily product-based instruments such as PRINCE2 and a focus on technical implications, the described model focuses on the reorganization processes within the administrative organization units of universities that are related to the implementation of such IT systems.

3. Modules for a successful change management

The successful implementation of a campus-management-system requires several components of change management (see Figure 1). These are planning elements such as the initiation of an appropriate project management (elements 3.1.1.-3.1.4), modules for conceptual and technical design like process analysis and modeling (elements 3.2.1.-3.2.3.) and modules to configure the

accompanying communication and cooperation processes such as the moderation of working groups (elements 3.3.1.-3.3.3.). A target oriented design and combination of the ten components allows the accurate adaption of the accompanying change management to the individual implementation process of the campus management system.

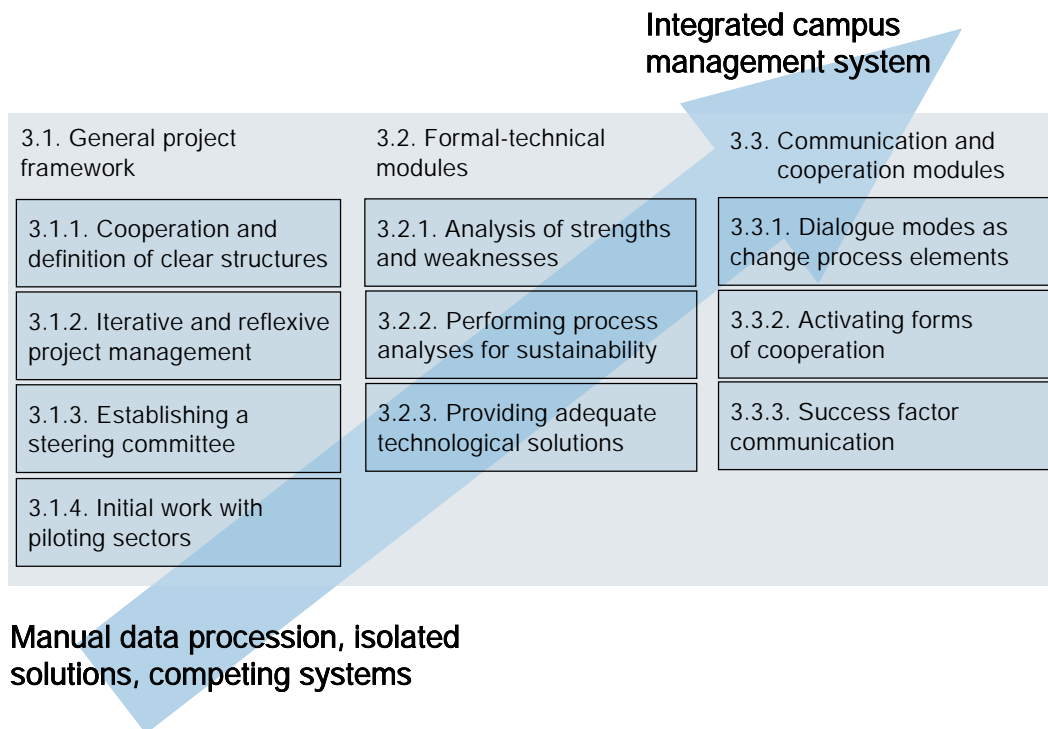


Figure 1: Modules for the successful implementation of campus management systems

The modules described below in detail create a framework which embeds many individual activities, coordination and negotiations for implementing a campus management system. This framework assures stability and continuity in change. Useful routines will be established and the predictability in the behavior of the different actors will be increased. The project management coordinates all sub-objectives and activities of the project and ensures a proper consideration of the various modules in the implementation process.

3.1. General project framework

3.1.1. Cooperation and definition of clear structures

On the one hand the implementation of campus management systems is flexible with regard to the specific wishes of the actors only in a limited way. On the other hand, IT systems can not be implemented in universities only by using standards or guidelines. The successful implementation of an IT system is always the result of a complex social process. Therefore, the university has to encourage their members to participate in the implementation process and should establish a planning structure for a limited number of active players at the same time. However the intention to involve all actors into the first phase would overextend the universities' communication systems. A successful planning process requires a continuous group of decision relevant stakeholders who are willing to engage in the project realization over a long working period (Selle 1999).

In the light of the complexity of the planning object and the time pressure for the planning, a form of organization for planning is required, that

- § establishes a high commitment among the actors involved,
- § has clear structures,
- § specifies the responsibilities,
- § permits negotiations,

- § guarantees the information flux,
- § allows a competent discourse about individual implementation steps and
- § ensures efficient work.

To achieve these objectives cooperative elements such as flat hierarchies or even communication practices during the planning are needed on the one hand. On the other hand hierarchical elements such as a limited number of participating people and clear decision structures have to be used as well. For the implementation of campus management systems a mixture of the different planning approaches is favorable. The actor relationships should be open and the communication form should be even and dialogue-oriented. In deliberate contradiction, hierarchical elements and clear organizational structures and responsibilities should be used as well. Only such a combination can secure target-oriented action over the whole project process and prepare the basis for a long-term project success.

3.1.2. Iterative and reflexive project management

The internal project management and project coordination has to be taken over through the university. Specific challenges emanate from the combining of the different project levels: The technical and organizational implementation in the administration as well as the establishment of satisfaction at the actual target groups in the academic sector and in the university management (Zöllner 2003). To guarantee this, contacts have to be made and cultivated to existing, establishing and sometimes competing workgroups, to the higher management, to the academic field and, if necessary, to external consultants. The project management coordinates the individual activities, reports to the university management and the steering group, pursues and escalates open issues if needed and, thus, secures the success of the implementation and widespread use of the campus management system. It becomes clear that for the project management within the university, persons need an ambitious competency profile with high communicative skills, an overview over the whole project, good consistency and tenacity. In addition, the project management has to have the necessary authority that could partially contrast to existing administrative structures.

For the project's success, besides standard elements of project management such as project schedule, roadmap, milestone planning and controlling (Weigl 2006), a course of action in iterative, reflexive loops is essential with an adequate degree of flexibility. Usually at the beginning of a project not all relevant information are available for reliable regulations. Consequently the limits of predictability in project management have to be taken into account. Wimmer also recommends establishing the project management for these enormous organizational change and transformation processes in a way allowing for dynamics of its own. It has to be taken into account that the process is not calculable in principle. That means that neither the result of the transformation nor the way of the transformation is exactly calculable (Wimmer 2004).

Therefore elements of open planning and iterative project management are necessary (Böhle 2006). This also implies that deviations from the project plan are esteemed as something usual and expected that has to be communicated as early as possible to identify alternative options in time. In addition the approach of an iterative and reflexive project management helps not to lose sight of the actual benefits of the project besides time planning and cost control.

3.1.3. Establishing a steering committee

A steering group resp. a steering committee has the task to dispose of the essential decisions within a project. The configuration of the steering committee should reconsider all persons and relevant groups who are important for the realization of the project. The steering committee meets regularly, develops guidelines, gathers information, reflects project results and balances the different alternatives in the project. The final decisions for the concrete realization of the project are based on this work.

In a project carried out by the authors in one German university concerning the implementation of campus management system the chancellor, the vice-rector for research and teaching, the chairman of the exams committee, the head of the exams office, the head of the IT-department as well as the deans of the faculties were members of the steering committee. This configuration of members of the university management, the administration management and the academic sector has turned out to be very useful and productive, precisely because it was possible to consider the changes in the work organization according to the Bologna process in an optimum way. In the exams administration,

for example, new tasks and responsibilities were arising for the administration and the academic sectors that were followed by an increasing demand for communicative coordination, e. g. in the administration of modules, exams and lectures. In this manner these new tasks, in conjunction with the conflicts resulting from them, should be made the object of common discussion and should be directed to an acceptable solution for all concerned participants.

3.1.4. Initial work with piloting sectors

The use of piloting sectors, e.g. single faculties or studies, has turned out to be a very useful way in the initial work to process all essential questions in a preliminary frame. The essential base for the following realization of the project was made in the pilot sectors. The important project guidelines were determined and the bases for further decisions were created while discussing the different alternatives of action. The work with pilot sectors however requires structures of planning which enable dialogue, participation and cooperation.

Within another project concerning the implementation of a campus management system five studies from different faculties were chosen as pilots. Each study was represented by a professor plus an employee of the exams administration. Within several workshops coherent description standards for module handbooks were developed with respect to the requirements of the accreditation agencies. The way of implementing the examination rules into the IT-system was revised and test environments were established to check and modify the whole module, examination and course administration according to the requirements of the university. Against the background of the introduction of self service functionalities, forward-looking processes for the administration of modules, exams and courses were designed and concepts for application, allocation and admission of courses and exams were developed. Furthermore, a concept for the different roles was developed that enables a binding assignment of tasks to the different actors in the university. The results of the workshops were saved for using them as working and marketing instruments in the whole institution.

Especially from the work with the pilot studies, the advantage of the implementation of the campus management system was early recognized and experienced by the workshop participants. The possibility of co-designing the implementation process opened the context to the users in its contents and by cooperation. The members of the pilot studies became constructive actors, internalized the project tasks and developed high acceptance to the whole project. Beyond that, the members of the pilot studies acted as multipliers into the university as a whole (Kraus, Becker-Kolle & Fischer 2006).

3.2. Formal-technical modules

3.2.1. Analysis of strengths and weaknesses

Apart from the general aspects that lead to the implementation of a campus management system, there are mainly concrete demands and requests of the academic sector and the students which are not fulfilled sufficiently by the existing administration based on IT or not. Increasing dissatisfaction with the existing situation produces a climate demanding for a change. In this situation the comprehensive use of IT is often seen as the solution that manages everything faster, better and more efficiently. The technique is available - thus the promise of the providers of campus management systems. It just has to be implemented and switched on. In that situation it is indispensable to analyze the existing situation within the scope of an analysis of strengths and weaknesses. This will produce the basis to implement the campus management system according to the requirements of the users and to adjust the project planning and the change management according to the actual demands of the university.

The established procedure is to ask the different actors and stakeholders directly upon the most important weaknesses, potentials for improvement and demands. At best, a working group with members of the different sectors is formed (department, IT-management, academic sector, students) to avoid suspicions of an unbalanced procedure.

The identified weaknesses are afterwards categorized according to their priority and their possible reasons. These categories should not be too detailed. A raw classification with three categories (high, medium and low priority) has proved to be sufficient. The second step is to classify the weaknesses by their technical, organizational and content-related deficiencies. This demands a high level of background knowledge, because it may not be recognizable at first glance whether an

inappropriate input mask for module components is caused by bad programming or due to undefined roles and rights. In the last case, it is not a technical problem but it is to be solved by better organizational structures. Moreover, the contents of modules are primarily to be clarified on the content level before the technique can be configured according to them.

3.2.2. Performing process analysis for sustainability

With the implementation of a campus management system, trendsetting operating processes have to be designed that are based on the lessons learned from the analysis of strengths and weaknesses (see section above). This leads to an optimization of the processes to generate the greatest benefit for the university. The implementation of web based self-service functionalities cause fundamental changes of the tasks of the single actors and is accompanied by a reorganization of the exams processes - considering the technical possibilities and demands. In cooperation with the academics and the administration the processes have to be designed in such a way that universities can face future demands effectively. A process design isolated from the concerned actors risks evidently to failure in later periods of implementation. The processes designed in participation with the actors however give an accepted and stable basis for the technical implementation and configuration of the campus management system.

The implementation of a campus management system according to the discussed approach includes process analysis and the redesign of processes of exams plus the re-design and changing of teaching modules. Especially the administration of these modules represents a lot of problems and requests: when and how to change modules, which module types and module contents are variable, which coordination procedures shall take place when modules are simultaneously used by different studies etc. When these issues remain uncertain often coordination problems, conflicts and dissatisfied users will originate.

3.2.3. Providing adequate technological solutions

Although this article above all discusses the monitoring of the implementation process of campus management systems, it has to be stressed that providing adequate technical solutions is the absolutely essential basis for the success. The different solution approaches that have been negotiated, developed and moderated with the actors have to be implemented in the IT systems as soon as possible. In this situation there is a must of "experimentation" and shaping, because with appropriate project management the innovative and university specific strategy is obvious to the players and the early participation is seen quite positive. Moreover, many non-IT users realize the implication of their functional ideas on the technical processes and the administration in the practical application. Thus, the task of IT is not only to offer reliable and contemporary solutions, but also to design them in a way that easily allows for later adaptations.

3.3. Communication and cooperation modules

3.3.1 Dialogue modes as change process elements

The design of the change process depends on dialogues and the intense discussion of issues, problems and methods of solution. The establishment of different forms of dialogues is very important because they establish the conditions for a competent discussions and responsible decisions. The following kinds of dialogue have to be seen as very useful for the implementation of campus management systems (the concept of discourse design is borrowed from risk communication, WGBU 1999):

- § The cognitive dialogue clarifies the facts. Guideline for this dialogue is the question whether a fact truly matches the reality. This kind of dialogue is mainly used to find the truth and therefore to create trust. If the circumstances cannot be clarified, this kind of dialogue is making the arguments transparent so they can be weighed and assessed in their strengths and weaknesses.
- § The reflexive dialogue covers knowledge, preferences and values as well as the normative assessment of problem constellations. It allows for an understanding of a volume of knowledge, e.g. with regard to technical details. Furthermore this kind of dialogue reveals moral concepts to estimate different options for project realization. Proposals for improvement and new solution approaches can be developed by reflexive dialogue. Mainly this kind of dialogue should help for decision making and plays an active role in anticipating avoidance of conflicts.

§ Cognitive and reflexive dialogues should not be done for themselves. Because they have to induce concrete decisions, the configurative dialogue assesses alternatives of action as well as solutions of tangible problems and conflicts. Thus, the different options developed in the other dialogue forms will be transformed into decisions for the project work.

3.3.2. Activating forms of cooperation

Processes of change have to be formed and kept stable over the whole project period. The responsibility for a successful project design is carried out by all participants of the planning process. In different universities this process is supported by various moderation techniques that enable a purposeful proceeding, a methodical and creative work in groups as well as a functional and hierarchy free synopsis of different forms of knowledge (Selle 1999). The methods of moderation are implemented according to the requirements of the planning process. This means the methods are not implemented for their own sake but methods are chosen for activating people. The workshop moderation of IT projects lives from situation-related and flexibly adjusted moderation methods. The spectrum of methods includes different techniques like metaplan, future and planning workshops, conflict management, methods of interaction and Gestalt pedagogy.

For moderating events in universities it is useful to choose methods that reduce discussion barriers and create partner-like relationships. Therefore it is necessary to explain complicated issues, discuss them in an atmosphere where all participants are equal and conflict situations are solved by mediation. Different forms of visualization create clear structures and preserve central ideas. The created project overview serves the integration of all project participants and therefore helps to come to decisions in an objective way.

3.3.3. Success factor communication

The success of change processes depends on the perception of the situation through the participants: Do they think they are sufficiently informed? Are they aware of the advantages and benefits of the change? To which degree can they realize their own ideas? Therefore, the design of communication and information with the use of emotional messages is an indispensable component of the implementation of a campus management system already from the very beginning of such a project. A well organized communication management enables an active formation of the relations within the (project) team and its relevant environment. Critical signals can be detected early on and therefore influence the following process in a productive way (Stender, Jablonski, Brune & Möhle 2007).

The communication management can include a number of parts with different functions:

- § providing information and service for participants of the project and other interested people,
- § producing transparency concerning objectives, decisions, results etc.,
- § feedback loops back into the project ("early warning system") and the creation of participation and feedback processes,
- § project marketing and internal and external public relations,
- § facilitating internal project communication as well as
- § ensuring permanent documentation of the project.

Setting priorities depends on the actual targets, the process phases and available resources.

An established procedure is oriented on target groups. At first, it should be determined which target groups (students, teachers, administrative staff that represents prospective "power users" of the system) obtain which priority. For these groups the demand on information and communication has to be analyzed and then specific strategies will be developed considering the particular characteristics of the target group; e.g. use of media, availability and linking to IT. These strategies are combined in a communication concept with tangible actions: Who is informed at which time by whom on which way about what? (Zowislo & Schwab 2003).

4. Conclusion and outlook

The implementation of campus management systems at universities is a very ambitious endeavor. On the one hand the outreach of the IT system has a great influence to the academic sector and to the administration. On the other hand the aims and interests of the different actors are very

heterogeneous within the university. The authors presented orientation and guidance by means of ten modules facilitating a successful implementation of an IT-based campus management system. Much importance is attached to the fact that the mere adaptation of separate elements is not sufficient. The modules have to be combined to form a compatible and adequate implementation concept for campus management systems. The ten elements can easily be adapted to specific requirements and conditions of different universities. The authors' expertise from consulting projects clearly shows that only an individual adjustment of the change process will make the IT system's benefits unfold to the full extent. The professional project management's responsibility is to keep track of the whole change process and to focus on different modules in accordance with the specific level of project maturity and current requirements.

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