Towards Business Alignment of IT Services in Universities

Challenges in Elicitations of Requirements for IT Services

Christian Erfurth
Industrial Engineering and CIO
University of Applied Sciences Jena
Jena, Germany
christian.erfurth@fh-jena.de

Ivonne Erfurth
University Computing Center
Friedrich Schiller University Jena
Jena, Germany
ivonne.erfurth@uni-jena.de

***Abstract*—Universities tackle with requirement elicitation for suitable IT support. The integration of stakeholders is challenging. Furthermore, business processes in administration, education and research of universities are not available for all subjects or not with necessary details. IT departments work in traditional ways to provide IT systems. A coupling between university governance and IT organization with regard to content is missing mostly. IT frameworks like ITIL and COBIT are promising to achieve an alignment of the IT to business demands. However, the frameworks need an adaption to university contexts. Furthermore a cultural change might be necessary to enable universities for the application of such frameworks – an organizational development of IT might help as well as the introduction of IT service management and IT governance.**

***Index Terms*—Requirements elicitation, business process, IT service, IT organization.**

I. Introduction

Currently German universities and universities of applied sciences are in a process of changing. The financial situation spurs the administration of universities to build an economical institution. The number of acquired students and the number of successfully finished graduates attract notice to the leadership and the funding. Students Lifecycle and Campus Management are recent keywords. Business Process Modelling (BPM) in practice finds its way into the administration of universities.

Therefore, in an academical context Requirements Elicitation (RE) and Business Process Modelling (BPM) are not only concerned with eliciting and managing requirements related to a software system but also used to find and optimize organizational structures and administrative processes.

Academical computer centers play a decisive role in supporting processes of universities. A good collection of IT services can efficiently support processes in studies and teaching as well as research and transfers. However, for academical computer centers it is hard to find equivalent IT services. Mostly, they are confronted with the task to support academical or administrative processes without any information or only with insufficient information about these processes. Some frameworks like ITIL and COBIT focus on business processes and provide the development process of new IT services. Nevertheless for employees of IT centers this means often a process of change.

In this paper we describe general challenges in eliciting requirements to develop and establish IT services which support academical and administrative processes of universities. We start with giving an overview in difficulties to identify stakeholders at universities as well as to identify requirements for IT services. In the next section we focus on business processes at universities. After this we have a look at two frameworks, ITIL and COBIT, which provide development and establishment processes as well as support the operational phase of IT services. Finally, we pinpoint problem statements in identifying suitable IT services and related aspects.

II. Stakeholder Identification and Requirements Elicitation to Establish IT Services

As mentioned before, academical computer centers play a decisive role in supporting processes of universities, but it is hard to detect suitable IT services. First challenges in developing and establishing IT services to support academical and administrative processes of universities are:

1. Who is the stakeholder technically, and what kinds of stakeholders exist at universities?
2. How can we identify requirements for IT services which support major processes at university?

Stakeholders in academical institutions are wide-ranging and differ in its requirements on IT. Burrow [1] presents a stakeholder set with specific groups within institutions (see Fig. 1.). Not all of them influence IT by providing requirements. But besides internal stakeholders (members of university governance, employees) there are connections with external stakeholders (clients, governmental regulators) which have an effect on processes and IT systems.

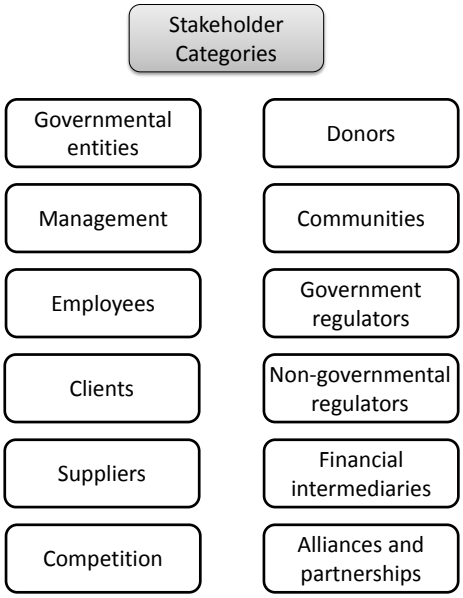

Fig. 1. Stakeholder Categories (Source [1])

Moreover, because of the organizational structure we have to differ between user and customer. Users utilize IT services. However, users do not decide about an implementation of a service. Normally, members of university governance (the management) are customers and decide on strategy and funding. The leadership of the university is in charge to define requirements. But this task is delegated to departments and units often. For the elicitation of requirements and decisions on strategy and financial aspects stakeholders from the categories Management, Employees, and Clients are of importance (see Fig. 2.).

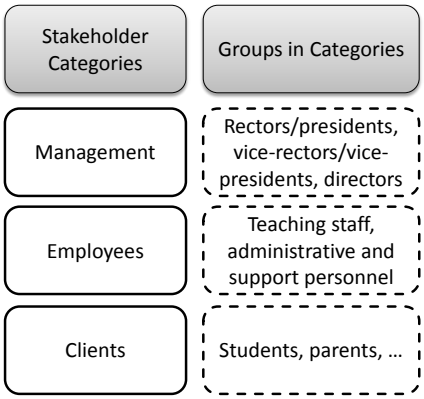

Fig. 2. Most relevant stakeholders (categories and groups from [1])

Mostly, academical computer centers do not have a specific order to provide a certain IT service. On the one hand, an absence of a concrete stakeholder will lead in this situation and it is hard to identify possible requirements without stakeholders. Especially in acadamical environment a wide field of stakeholders exists and requirements are ambiguous. Sometimes requirements are controvert. The alignment of IT services to business demands is not yet reached. For example, one part of a questionnaire [2] filled out from students of three different German universities shows the importance of Learning Management Systems, but only some students used a Learning Management System. Requirements will not be taken into account adequately for the service portfolio of IT and lead to drawbacks in IT services.

On the other hand, Business Process Modelling in academical administrative organization is in its infancy. Employees of administration model processes in addition to their actual work. Mostly, they do not have profound knowledge and education in modelling processes. The problem is going to accelerate. First, the administration is not aware of the importance to communicate business processes to computer centers. Thus, computer centers develop IT services without knowledge about concrete business processes. Second, typically system administrators do not have profound knowledge or an education in modelling processes too.

III. Business Processes at University

Universities define business processes to get knowledge on and to organize processes in administration, education, and research. On the highest level process landscapes give an overview on processes. All actors are able to get an insight in their area of adding value. Typical core processes for a university are studies and teaching, research and transfer, as well as continuing education. These are the main elements where a university gains added value. A sample process landscape is shown in Fig. 3. adapted from the organizational development program TUDo of Technical University Dresden [3] (a common process landscape can also be found in [4]).

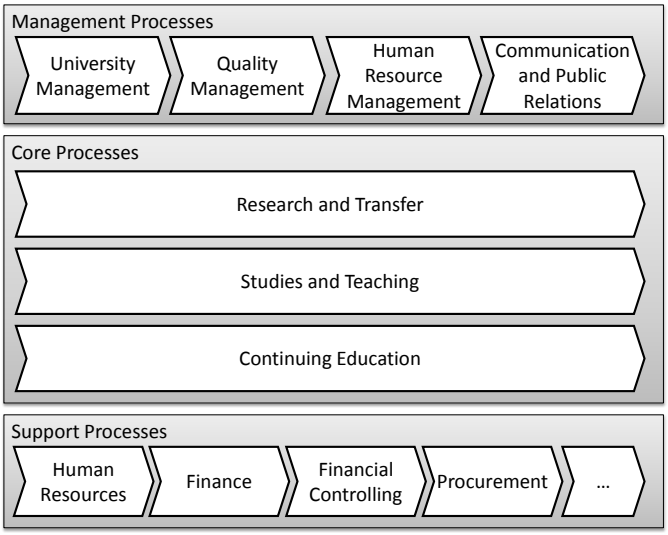

Fig. 3. Sample process landscape adapted from [3].

Business processes are defined with different granularity at universities. They also differ from university to university. Depending on the politics of the management the processes can be accessed by university members. In fact the business processes are guidelines for valuable IT support. So far academical computer centers did not oriented on business

processes. Often, the centers arranged IT services technology driven.

IV. Towards IT Services to Supporting Processes

Due to the historical development of computer centers, system administrators checked new technologies. If the technology does well functioned, they use the technology for itself. If necessary they roll it out for any or all users of the university. Often a concrete development process does not exist. Documentation is more or less for system administrators and not for users without any technological background. Instead of focusing on the customer traditional computer centers focus on technology [5].

ITIL (IT Infrastructure Library) [6] is a well-known best practice for IT service management and helps to establish services in high quality. ITIL is a framework which describes a method to developing services from business requirements until go-live of the service (see Fig. 4.)

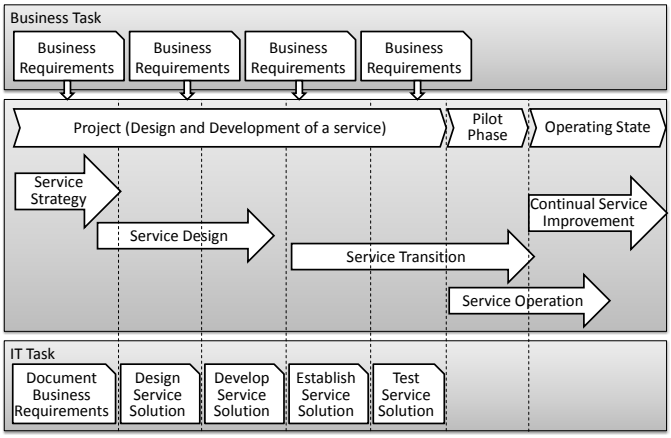

Fig. 4. Design of Service Solutions (adapted from [6]).

ITIL gives with five phases of a service lifecycle – Service Strategy, Service Design, Service Transition, Service Operation and Continual Service Improvement – a method to design and provide a service. However, ITIL as a framework says "**what**" to do, but ITIL does not say "**how"** you have to develop and operate IT services and how you can capture business requirements. ITIL leave it consciously open. The very fact that ITIL says "what" means in the university context a lot of organizational changes will be necessary when adapting the framework. Computer centers have to find out by itself how services can be developed and established. The problem is, most system administrators do not have a profound education in service management and the expertise in development and operation of services is merely technology driven. Changes in the organizational structure are involved with human resource development and employees have to be qualified in service management.

An introduction of ITIL is a long process of changes. It is not possible to introduce ITIL overnight. With the introduction you have to entrain all people of the IT organization. Processes have to be analyzed and possibly optimized. People may be afraid of changes, and one should not underestimate, the fear of losing indispensability. Process analyzing implies an establishment of transparency. ITIL brings transparency and sustainability, but not each one likes this.

While ITIL is a process oriented approach to establish IT service management COBIT [7][8] as another framework focuses on control aspects especially on IT Governance. Core elements of COBIT are:

- Plan and organize,
- Acquire and implement,
- Deliver and support, and
- Measure and evaluate.

Each element has defined processes, goals, and metrics. COBIT addresses the strategic alignment of IT with business goals and by that also requirement elicitation. But it is even more abstract than ITIL. In combination with ITIL, PMBOK, ISO 27001 and 27002, COBIT is applied to address IT governance. By adapting these frameworks one could tackle drawbacks in the process of Requirement Elicitation. However the application of these frameworks might be a major change for universities.

V. Problem Statement

As stated above universities provide process landscapes and define processes mainly driven by administration and focused on administration. Actually core processes for education and research are defined roughly. For the definition of IT services a prerequisite is the definition of business processes on a useful level of granularity. Therefore, a stepwise transformation of requirements to value added IT services is necessary (compare Fig. 5.):

1. Elicitation: Collect requirements from stakeholders
2. Modelling: Consolidation of requirements and transformation into process models
3. Extraction: On base of models point out possible IT support and derive IT requirements
4. Definition: Define service changes or in case of new services create a service design package
5. Operation: Go into service transition to establish value added services

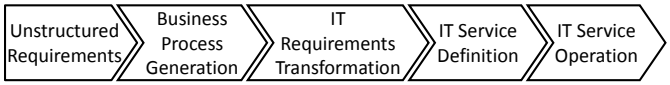

Fig. 5. Stepwise requirement transformation.

To achieve such a process model IT can no longer be a separated part of universities. This holds not only for large (IT) projects like ERP and Campus Management but also for small IT supported improvements. One outstanding goal is the business alignment of university's IT. IT service management and IT governance frameworks are promising in this context. However, some obstacles lay in the nature of universities: The guidance in the academic areas is weak due to freedom degrees in education and research. Furthermore, there is no defined

accountability for requirements elicitation often. How to tackle these challenges?

At the moment we focus on the following cornerstones mainly:

- Process oriented positioned university management
- IT Service Management aligned IT department
- Introduced IT governance within IT organization

Universities need to establish process orientation. This is a necessary base for specific IT support. The usual way is a definition of processes by business process models. The integration of IT knowledge in this step has become more important. There might be a gap of technology focused IT personnel and management/process oriented models.

At least in Germany many academical computer centers have started to introduce first service management processes. Especially service request, incident and change management processes are adapted there. Computing centers stuck with further process introduction. Processes to develop IT strategy and holistic service design are hard to establish. We assume a suboptimal IT organization as a possible reason for that.

The design of the organization is a crucial factor for the implementation of the process model (shown in Fig. 5.). It controls important aspects like:

- Stakeholder integration,
- Governance,
- Strategic alignment.

Simply spoken, this is a question of roles and accountabilities. Since universities are driven by boards to get consensus and decisions the IT organization would benefit from well-arranged boards. With a view to stakeholders (see Fig. 2.), the integration from management, employees, and clients need to be realized. Therefore boards with strategic alignment should include management. This holds for financial aspects too. Requirement elicitation can be achieved by the integration of employees and clients (students) within a board. Typically such a board has also the focus on IT services. For the creation of business process models a university need to establish a responsible and accountable post which collects necessary information from involved parties.

Finally the IT organization needs to implement IT governance and service management to align the IT to business demands. ITIL and COBIT are useful frameworks which could be adapted for that purpose. However, this is a cultural change for the position of the IT in universities and for the IT itself.

VI. Summary

Requirement elicitation in universities is challenging. The integration of relevant stakeholders is not yet established in a professional way. Universities have started to document business processes. The focus lies on processes from the viewpoint of administration. Requirements from other stakeholder groups like researcher or students won't find entry in business process models.

With a cultural change within the IT and with impact on a university this might change. The introduction of IT service management and governance models help to get a business alignment of the IT which leads to value-added IT services. But some questions are still open:

1. How can we identify stakeholders?
2. Wherefrom do we get requirements?
3. How can we transfer frameworks like ITIL or COBIT in IT organizations of universities?

Academical computer centers need to have advisory boards for different purposes and with special focus respectively – a change within the IT organization. By this way requirements, business processes and IT services can be brought in line. Existing IT frameworks may support this after adapting them to a university context.

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