A CRITICAL VIEW ON THE GERMAN PROCUREMENT PROCESS FOR PUBLIC BUILDINGS

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ABSTRACT

Public administration is one of the major contracting bodies for the German construction industry. Few studies refer to procurement processes for public buildings considering this process as one enclosing cycle, starting from demand formulation by the end-user until delivery. The present paper has performed a critical analysis of the procurement process of the German procurement process, based on a case study carried out within Karlsruhe University. Mapping the current value stream unveiled 18 consecutive sub-processes and 7 different stakeholders, showing a situation where a governmental administration is considered to be a controlling institution rather than a service provider. Based on this field data, the authors present a set of proposals for a more radical improvement of the German procurement process, focusing on shortening the cycle time, increase transparency and improve value added.

Key words

Procurement process, public administration, lean principles
**Introduction**

Lean principles are widely spread in production of manufacturing industries. However, there are scarce reports on its application on the administrative processes. Wiegand and Franck (2005) define the term of “lean administration” as the application of lean management approaches and methods to the area of business processes. On their view lean principles observed on production systems could be directly transferred to administrative processes.

Wiegand and Franck (2005) state that an industrial approach for lean administration is to focus on customer value detection, on creating stable processes with defined interfaces, high productivity, few errors and a minimum of waste. The objective is to increase value, to improve the parameters of productivity, quality and performance in offices and hereby cutting the processing time (WIEGAND & FRANCK, 2005). Another important point is the reduction of value-loss, which in practice is more difficult enclose, as defined as the conduction of measures to reduce the gap between the estimated potential value versus the currently achieved value.

This research has investigated the use of lean principles on the procurement process of public buildings in Germany. Procurement on this research is referred to processing an order, thus starting from the demand for a new building until its delivery to the end-user. Therefore the process-cycle time refers to the whole procurement process of a construction project, defined as the process starting from the set-up of the first process step (demand formulation) continuing through order creation, planning, other intermediate steps and construction until the final delivery of the product to the customer.

The construction process of public buildings is generally under scrutiny by society, particularly when the issue is waste. That is the also case of Karlsruhe University, Germany,
where the main author carried out his field study. Karlsruhe University employs over 2200 people and was selected in 2006 within an evaluation process as one of the three elite universities of Germany, honored with extra funding for research. Hereby, the issues of quality measurements, efficiency, transparency and shorter lead times in procurement processes are also perceived as increasingly important within Karlsruhe. Project cycle times of several years for certain projects roll-outs evoke particular interest to investigate procurement processes.

Research Method

The exploratory case study method is related to the purpose of the study, thus it is tried to find out what is happening within the macro processes and to seek new insights by posing qualitative questions. The chosen scientific method enables the inquirer to achieve the aim of examining and suggesting improvements on the current macro process of procurement by the analysis-method of value-stream-mapping based on literature research and the semi-structured interviews related to the case.

The research protocol for the field study was carried in three phases. The first phase involved a direct dialogue with the head of the department, clarifying the framework of the study. On second phase the researcher applied semi-structured interview, focusing on an organizational analysis as well as project activities. One the third phase the researcher applied a detailed interview with a focus in just one construction project, in order to enable the development of a value stream mapping of the procurement macro processes.

The macro processes of the construction planning and procurement were also investigated using document analysis of governmental guidelines. The general process description is
derived from governmental guidelines, which was then verified with the reality at the construction department of Karlsruhe University within the case study.

Internal validity was obtained by triangulation. The transcription of each interview was sent to the respective interviewed person for verification and confirmation before being explored in the analysis. External validity was derived from literature results such as official publications for the proceeding of procurement in governmental organisations as well as adjacent discussions with specialists of lean management.

RESULTS

Understanding the procurement process at Karlsruhe University

By law, the education system in Germany is based in the perimeter of responsibility of each State Government (Bundesland). In Karlsruhe and another eleven cities in the state of Baden-Württemberg, there are separate construction departments for the universities (Universitätsbauamt). The governmental real estate and construction departments are built in three levels of authority (according to the governmental procedures (DAW, 2002):

- Financial ministry of each state as being the highest administration authority (Finanzministerium)
- County control offices (Betriebsleitung, früher Oberfinanzdirektionen)
- Local construction departments (Bauämter), split into real-estate management and construction management, some of them particularly related to universities (Universitätsbauamt).

This distinction of three administrative and organisational levels is relevant for the degree of authorization to make decisions concerning construction projects and public investments.
Universities are large administrative entities - for instance, in Karlsruhe in 2006 there were 18245 students enrolled and 2246 people employed, according to official publication of the head of the university. Therefore the infrastructure of these education centres is within the scope of responsibility of the state government, comprising the management of real estate as well as construction and maintenance.

The internal organisation of the construction department is split into two teams working on construction projects and another team which is dedicated to technical issues, such as heating installations and electricity. Each team consists of 8-10 people, led by a head department section (Abteilungsleiter). Next Figure shows the interdependencies of the university, scientific staff, governmental financial institutions as well as executing construction companies.

![Diagram of interdependencies of the construction department and stakeholders](image)

**Figure 1 - Interdependencies of the construction department and stakeholders**
The construction department understands its own function as a governmental institution with the objective to provide and preserve real estate in form of buildings and offices to Karlsruhe University. The final end-users (students and scientific staff) are decoupled from the construction management and planning because the demand for new public buildings is received and centralized by the central administration department of the university, which is the direct contact partner of the construction department. A physical meeting between people of the construction department and central administration of the university is held on a quarterly basis to discuss technical and constructional issues.

The decision making process and procurement is strictly defined by governmental procedures (DAW 2002). Projects are divided into small, medium and large projects according to the amount of resources required. Investment decisions for large projects must be authorized directly by the governmental ministry of finance, whereas medium and small projects are authorized by the county control office and micro projects can be directly initiated by the construction department (large projects > 1.25 million Euros, medium projects 0.375 until 1.25 million Euros, small < 0.375 Euros). The current process for procuring a construction project can be directly evoked by the construction department in case of new safety requirements (for example fire protection standards) or maintenance, which represents 40% of all construction projects in Karlsruhe. The other 60% of procurement processes for public buildings are evoked by university departments, directing their requests to the central administration of the university. Here the demands are centralized and handed over to the construction department for evaluation, elaboration and budget approval.

The field study unveiled that there are seven different parties involved as stakeholders on the German procurement process: the Financial Ministry (1), the County Control Office (2), the
Construction Department (3), External Companies such as architects, planners and construction companies (4), Administrative Head of the University (5), University Faculties and Institutes (6) and the end-users which are students and scientific staff (7). The macro-procurement process is composed of eighteen consecutive sub-processes, each of them related to one or several stakeholders. The 18 sub-processes can be grouped into five main phases of the procurement process:

A.) Pre-Setup: Demand formulation, verification whether the demand is justified (1-7)

B.) Pre-planning: Budget estimation, preplanning and decision to invest (8-13)

C.) Real-planning and design: Tendering, planning, regulation of legal aspects (14)

D.) Execution of construction project, management and supervision (15)

E.) Delivery of the building, hand-in project, satisfaction of the demand (16-18)

The main identified sub-processes of procurement are the following steps (note that not all of them are value-adding sub-processes):

- Pre-setup and demand formulation;

- Verbalisation of need for a building facility expressed by a faculty, institute or end-users (students, scientific staff);

- Declaration of need for a construction project centralized at the administration head department of Karlsruhe University;

- First consultation of the Construction Department concerning the utilization and an estimated verification of the necessity and priorities; if ok then
• Formulation of the “utilisation-request”, which is a written document, describing in more detail the requirements of this procurement by the central administration department of the university to the construction department;

• Examination and check of this document (utilisation request) by the construction department; if ok then

• Examination of the same document by a work group of the county council office; if ok then

• Examination and acceptance of the utilisation document by the Financial Ministry and the Ministry for Science, Arts and Education;

• Pre-planning and budget estimation;

• Kick-off meeting with the stakeholders: county council, construction department

• Elaboration of the first budget and time estimation for the realization of this project, based on the requirements formulated in the “utilization request”, done by the construction department

• Advance notification of the proposition for this procurement project to the Financial Ministry, so as to gate this project into the financial state budget

• Assembly of construction documents (called “Bauunterlage”) by the construction department and in parallel request for the licensing of all legal aspects of this project, done by external planners or by the construction department;

• Examination and check of the construction documents (Bauunterlage) by the County Control Office;
• Acceptance of the project and budget approval by the Financial Ministry and in parallel the construction departments demands the petition for the pre-planning of the execution of construction.

• Real-planning, design and execution;

• Real planning, public tendering, bidding and construction process conducted by the construction department with external companies and architects

• Execution of construction by external companies, as well as monitoring by the construction department regarding cost, quality and time

• Delivery;

• Acceptance of order delivery by technical administration authority (technische Fachbehörde)

• Delivery of the facility and handing-over the responsibility from the external companies to the construction department and administrative head of the university

• Handing over the new facility to the end-users (students and scientific staff) and putting into service.

Labour situation at the construction department, Karlsruhe: the number of employees of the university construction department has been halved within the last fifteen years, although the investment volumes at Karlsruhe University maintained approximately at the same level (Schönhofen, 2007). For this reason the tendency is to pass more and more parts of the planning and design processes to external freelance architects, especially for bigger construction projects. However, each contract with an investment above 7500 Euros has to
pass the official tendering process. In the past, most planning and design was done directly by the construction department;

Since it is a governmental organisation, the construction department has no direct competition hence it is not benchmarked with external construction companies and has not the pre-requisite to become a profitable business unit. Nevertheless, benchmarking is done between the eleven different university-construction departments in the state of Baden-Württemberg;

The interviews revealed a understanding that the construction department main role is to represent the building owner: the state government. In this case the central administrative university department which centralizes the requests from faculties and end-users is considered to be the client of the construction department. In the phase of formulating the utilisation request, there is direct exchange between both departments. Once this formulation request is closed and accepted, the client has no right to ask for a major change. However, in practice if minor changes are required, it is possible to do so, if this does not significantly affect the budget. In case that the delivered building-facility does not meet the client’s expectations and required quality, this is typically communicated back to the construction department by claims;

The field study also have shown that selected collaboration with certain companies based on preferences and good experiences is not possible, as all projects with an investment volume above 7500 Euros by law have to pass the public tendering process (”öffentliche Vergabe”, Schönhofen, 2007). Hereby the first criteria for the selection is always price, second is to meet the required quality standards for the respective construction facility afterwards on time-criteria;
Another important issue to understand the procurement process on this case study is the work distribution. It was carried out internally by dividing the university campus geographically into sections. Each employee is responsible for a certain area with the prevailing buildings and is in charge of upcoming projects. If necessary, further resources can be reallocated within one division of the department. In this way one employee typically works on several projects at the same time.

According to self-assessment of the construction head-department, the current way and performance of the procedure for procurement of public buildings is satisfying. Nevertheless improvement potential is seen in the currently high lead-times for the project approval and financial budget approval which could be reduced. Schönhofen (2007) states that “despite it is declared by the government that the target of public administration is to become slim, there are always added further administrative process steps!” The interest of the construction department is to conduct the procurement process of public buildings as fast as possible. However, the public tendering process remains a time consuming operation and allocation criteria of public resources are still based on price (1), quality (2) and time (3).

**Proposals for radical improvement on the German procurement process for public buildings**

Based on the principles of lean thinking the have devised some proposal for radical improvement of the German procurement process (see Figure 2). These are divided into two parts with two process cycles, first the pre-planning process capturing all projects within half-year cycles followed by the real-planning, tendering- construction and delivery phase.

The proposal positions the University Central Administration with a construction section with a status of “process owner” of the pre-planning phase. Ownership hereby implies to act as a
permanent contact entity, to follow the process, pull information and to hold certain decision power. As the required and approved budgets within the last years at Karlsruhe University remained nearly constant between 15 and 20 million Euros, one of the main ideas is to anticipate budget approvals of the governmental ministry, to provide this budget to the central administration of the university, make the university owner and payer of the procurement of buildings.

The authors concluded that there is no need for a county-control-office as an intermediate function between financial ministry and construction office, as the responsibility is shifted directly to the university. Mismanagement of budgets can be fined by reduction of consecutive budget allowances.

Furthermore, the cycle-time for the budget allowance of the overall construction budget of Karlsruhe University is reduced to 0.5 years and being kept constant, independent of projects. The lead time for the demand processing of each project could be defined as 4 weeks as a major target. Batch-size reduction of the budget-approval could also be reduced with the 0.5-yearly budget allowance. At Karlsruhe University this represents a volume of about 9-10 million Euros. The main proposal hereby is to assign the ownership of this respective budget for projects that will come up in the next six months to the central administration of the university.

End-users, thus faculties or single persons, such as scientific staff could express their needs and demands regarding construction directly to the Central Administration of the university. This entity would then check the request of the particular project and specifies further details so that the construction department could elaborate a budget estimation. The target lead time for this demand processing could be 4 weeks.
Figure 2 - Radical proposal for the pre-planning-process for German procurement: the case of public university buildings

All requests for projects with the elaborated budget and time estimations since the beginning of the year would be accumulated by the central administration of the University. Until the end of the second quarter this entity would decide which requested projects should be executed by matching the available resources and clients demand.

The outcome of this decision meeting would be communicated to end-users and to the financial ministry as an input for the next budget allowance and the kick-off meetings with the construction department (both meetings should take place the working-day afterwards). At this stage the Governmental Ministry can still stop a project, if the decision of the University
on the deployment of resources is controversial to the global education priorities, formulated by the ministry.

The second part of the procurement process is referred to the real planning, tendering, construction and delivery of one project (see Figure 3). In this proposal process owner is also defined to be the University, as being representative of the end-user and paying party, exceptionally for the part of the execution of the construction itself, which requires further expertise, available by the construction department. As projects refer to a size over 1.25 Million Euro, there is always one person continuously working on one project and the responsible contact person, that also follows and monitors the whole process. The kickoff-meeting conduces to set up clear targets for time, cost and quality requirements that coincide with client expectations. This meeting forms the trigger to start the real planning.

Verification of legal aspects and licensing are arranged in parallel to the assembly of construction documents, either elaborated by the construction department or external companies. Adjacently, the University administration and construction department select the best bidders according to the requirements and budget estimations. This result is also communicated to the public (end-users).

Construction execution, acceptance procedure and delivery to the end-users is kept the same. However, in order to close the process cycle of each project there is suggested a conclusive meeting between the construction party and the central head-university, to consolidate return of experiences and report the outcome to the Financial Ministry. Results can be used for continuous improvement, PDCA-cycles, indicators of reliability and benchmarking.
Future process: part 2: real PLANNING, TENDERING, ELABORATION, CONSTRUCTION, HAND-IN

**Process owner**: head administration of the University, except for the construction period – here construction department; **Budget owner**: head administration of the University

**Responsible entity to conduct and control the construction process**: Construction department

**Trigger**: ½ yearly budget decisions of head admin University and kick-off meeting

**Process cycle time**: depending on the project

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**Figure 3 - Radical proposal of the pre-planning-process of the German procurement process: case of university public buildings**

These proposals could present significant impact on the German procurement process. Indeed, today no conscious link between final end-user and financing party (Financial Ministry). In contrary, both stakeholders are decoupled from each other as procurement lead-times for investment projects over 1.25 million Euros are often higher then the cycle time of end-users at university, by means of an average five-year education cycle for an engineering degree. Two other aspects of the current procurement process hinder the relationship between Government and End-user to benefit mutually from new investments:
• **Right to a say:** The procurement-demanding party (administrative head of the university) has only a right to a say for changes in the demand until the “utilisation request” is formulated and accepted by the ministry. However, the batch size of the financial state budget is triggered today on a 2 year mode. Therefore projects often need to wait for the next budget cycle (two years) only to pass the next sub-process hurdle. In the meantime the technology standard and requirements may change, which was exemplarily the case in the procurement process of the new library building at Karlsruhe University that took more then 15 years from demand formulation until delivery in which the construction period itself lasted only for 3 years.

• **Feedback about client satisfaction:** Today at the stage of project delivery, there is no feedback from end-users to the financial ministry or construction department. According to the interviews client expectations are met, if there happen to be no claims. However, value can hereby created by raising the awareness of who paid, who developed the project, for which objective and which end-users and simultaneously to initiate a process of learning-experiences and continuous improvement.

There is a need for a clearly defined process owner, here proposed the central administration because this stakeholder is closer to the end-users than the financial ministry and can directly communicate and interact with the clients (here for instance scientific staff). Furthermore the responsibility has to shift from a top-down hierarchical approach towards a further autonomous model with proper budget management at lower hierarchical levels (university itself instead of the financial ministry). Self-responsibility of universities to decide and prioritize certain construction projects facilitates to better capture the real needs of students and scientific staff.
Control instances have to be reduced while at the same time interdependencies and responsibilities are clarified and more transparent. Projects are grouped together on the high level of governmental ministries. On the shop-floor each project is closely followed by one person that is purely dedicated to one project.

Modifications and changes in demand can be made throughout the whole process, as the University itself (central administration) is the process owner and responsible not to exceed the overall university budget. It is further proposed that the university has the right to accumulate non-spent budgets up to two years to obtain more flexibility and avoid spending budgets within two quarters purely not to loose money within the next budget allowance.

**CONCLUSION**

The objective of this research was to get insight into the current German procurement for public buildings based on a case study and perform a critical analysis and proposals for more radical improvement. Mapping the current value stream unveiled 18 consecutive sub-processes and is related to 7 different stakeholders. The procurement process starting from demand formulation until the final delivery of a public building to the end-user is defined by the government in terms of procedures to be followed and it seems that the process as a whole from a client-value perspective has never been thought through. Therefore the authors propose a restructuring of the whole process, translating lean-principles into a more innovative procurement process.

This case study showed that a situation where a governmental administration is considered to be a controlling institutions and cost centres rather than a service providers. This mindset is reflected by governmental activities of constantly
decreasing the number of employees within these construction departments over the past years, in order to reduce costs and hereby assuming to “lean” the administration. As construction budgets remain constant, external freelancers need to be hired. This in reality increases the complexity of the procurement process because of compulsory public tendering for each project and sub-contract above 7500 Euros.

A real “lean” approach is here should focus on the customer, simplifying the process and allocating resources towards bottlenecks of the process to reach a better process flow, higher transparency and reduced lead times. Therefore the challenge is to convince politicians and decision makers to change structures of responsibilities and to imply lean principles in public administration without misunderstanding or misusing this term to cut jobs. The objective is to put the real meaning of “lean” into practice in order to simplify processes, reduce waste and better allocate resources towards their added value for the end-user.

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