

# A critical view of the German procurement process in the sector

*Uma visão crítica do processo de contratação no setor público da Alemanha*

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## Abstract

**T**his paper makes a critical analysis of the German procurement process in the public sector, based on a case study carried out at Karlsruhe University. The research protocol for the field study was developed in three phases: direct dialogue with the head of the department, document analysis, and semi-structured interviews. Data collection was concerned with both the analysis of the organization as well as with the mapping of project activities. A detailed study was carried out on a single construction project in order to enable the development of a value stream map of the procurement macro processes. Based on the data, the authors present a set of proposals for a radical improvement in the German procurement process, focusing on shortening the cycle time, increasing transparency and improving value generation. The study reinforces the need for more research focused on lean production concepts and principles in the public sector. By identifying radical improvement opportunities in the German procurement process, it may be possible to convince politicians and decision makers to change structures of responsibilities and to apply lean principles in public administration. The paper appears to be one of the first studies to apply lean principles into the procurement process of governmental organizations, in order to simplify processes, reduce waste and better allocate resources in order to add more value for the end-users.

**Keywords:** Procurement process. Public administration. Lean production principles.

## Resumo

*Este artigo faz uma análise crítica do processo de contratação no setor público alemão, baseado em um estudo de caso realizado na Universidade de Karlsruhe. O protocolo de pesquisa para o estudo de campo foi desenvolvido em três fases: diálogo direto com o responsável pelo departamento, análise de documentos, e entrevistas semi-estruturadas. A coleta de dados buscou informações para analisar a organização, bem como para realizar o mapeamento das atividades do projeto. Foi realizado um estudo detalhado sobre um empreendimento de construção civil, a fim de elaborar um mapa de fluxo de valor dos macros processos de aquisição. Com base nos dados, os autores apresentam um conjunto de propostas para melhoria radical no processo de contratação estudado, com foco na redução do tempo de ciclo, aumento da transparência e aumento do valor agregado. O estudo reforça a necessidade de mais pesquisas voltadas para a aplicação de conceitos e princípios da produção enxuta no setor público. As oportunidades de melhorias radicais identificadas no processo de aquisição alemão apontam que é preciso convencer os políticos e tomadores de decisão a mudar as estruturas de responsabilidades e aplicar os princípios da produção enxuta na administração pública de maneira consciente. Este artigo apresenta um dos primeiros estudos de aplicação dos princípios da produção enxuta no processo de contratação na administração pública, visando à simplificação de processos, redução do desperdício e melhor alocação de recursos no sentido de adicionar mais valor para o usuário final.*

**Palavras-chave:** Processo de contratação. Administração pública. Princípios da produção enxuta.

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## Introduction

Lean principles are widely spread in the manufacturing industry. However, there are scarce reports on the application of those principles in administrative processes. Wiegand and Franck (2005) define the term “lean administration” as the application of lean management approaches and methods to the area of business processes. According to those authors, lean principles observed on production systems can be adapted to administrative processes. Womack, Jones and Roos (1990) state that an industrial approach to 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 thereby cut the processing time (SHINGO, 1996). Another important aim is the reduction of value-loss, which seems to be more difficult, since it demands the establishment of measures of the the gap between the estimated potential value and the value eventually achieved.

This research study has investigated the use of lean principles in the procurement process of public buildings in Germany. In this study, procurement refers to processing an order, 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 society’s scrutiny, 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 2010 through an evaluation process as one of the three elite universities of Germany, awarded 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 in Karlsruhe. Project cycle times of several years for the roll-outs of certain projects evoke particular interest in the investigation of procurement processes Santos, Powel and Sarschar (2000) argues that the construction industry needs to incorporate flow and value principles into their

practice. He pinpoints four points from lean theory:

- (a) reduction of cycle time;
- (b) reduction of variability;
- (c) increase in transparency; and
- (d) building continuous improvement into the process.

Two of those, increase in transparency and reduction of cycle time are included as main considerations for improvement in the case study discussed in this paper. The choice of those two lean-principles is based on the assumption that higher overall-process transparency, derived from an overview of the current situation, provides a sound starting point for future improvements. Secondly, the reduction in process cycle time as a measure is chosen because the prevailing procurement lead-times at Karlsruhe University are very long (several years for large construction projects), so that the demanding parties (students) often do not get to benefit from their request, as the project delivery time often exceeds the average duration of their course, 5 years.

The overall objective of this study was to propose a leaner model of procurement process for public buildings in Germany, focusing on the reduction of cycle time and and on the increase of process transparency, based on critical analysis of a case study at Karlsruhe University.

## Lean principles

The lean philosophy proposed by Womack and Jones (1996) originally derived from the automotive industry, at Toyota, which developed a particular production system called Toyota Production System (TPS) originated from the two streams of Total Quality Management (TQM) and Just-In-Time (JIT) (KOSKELA, 1992).

According to Bonnevide (2006) and Alarcon (1997), the translation of the term “lean” corresponds to the American translation of “agile-fit-flexible” rather than the British translation of “thin”, as the application of lean principles entails more than cutting and trimming. Wiegand and Franck (2005) declare that “lean” stands for “creating value without waste”. According to Womack and Jones (1996) there are five implementation principles that represent the pillars of “Lean Thinking”<sup>10</sup>: Value, Value Stream, Flow, Pull and Perfection:

- (a) value is an attribute assigned to an object by its final customer (or, more generally,

stakeholder), expressing the level of appreciation of him/her towards that object;

(b) the target is to optimize the Value Stream by eliminating NVA, minimizing NNVA activities, and to support and optimize the VA flow activities;

(c) flow describes the easiness with which the Value Stream can cross organizational- or other boundaries. The goal is to optimize the Flow of the Value Stream, thus minimizing resource-consuming obstacles to the Value creation process and aim for a continuous flow;

(d) pull describes a basic control paradigm in which an upstream activity only starts after being triggered by a downstream activity. This can evoke minimization of the complexity of the control system and thus increase efficiency by lowering throughput and reaction times; and

(e) perfection describes the basic attitude that any technical or organizational system always can, and must be continuously improved.

Each of the concepts presented above contains different heuristic methods to enable their implementation in practice (KOSKELA, 2005).

In this article two measures from Lean Thinking were used to recommend proposals for improvement in the German procurement process for public buildings: increase in process transparency and reduction of process cycle time.

The increase in process transparency in production means to improve the ability of a production activity to communicate with people (SANTOS, 1999). According to Galsworth (1997), increase in process transparency can be adopted as one of the first steps in improvement programs, which forms a base upon which other improvement approaches are built. It means making the main process flows more visible from start to finish through process mapping, including physical and organisational means as well as the display of information and measurements (KOSKELA, 2000; FORMOSO; SANTOS; POWELL, 2002). Accordingly, successful implementation of process transparency yields in facilitated detection of abnormalities as well as higher awareness of existing types of waste. Therefore process transparency enables to conduct improvement measures more effectively as there is a strong link between incidents of non-value adding activities and information deficits at workplace (SANTOS, 1999).

Koskela (1992) suggests following measures to increase process transparency based on case studies in construction industries:

(a) maintaining a clean and orderly workplace;

(b) visual communication and removal of visual obstacles;

(c) reduction of interdependencies between processes;

(d) incorporation of information into the process; and

(e) rendering invisible attributes visible through measurements.

According to Womack and Jones (1996) the most important tool that helps the process transparency is the value stream map (VSM). A VSM is a simple diagram showing every step involved in the material and information flows needed to bring a product from order to delivery, and is therewith indispensable as a technique for visually managing process improvements (ROTHER; SHOOK, 1999). Mapping a process gives a clear picture of the wastes that inhabit flow (TAPPING, LUYSTER, SHUKER, 2002). Tapping and Shuker (2003) have additionally developed a VSM concept to plan, map and sustain lean improvements in administrative areas.

Process cycle time can be defined as the sum of all times (transport, wait, processing and inspection) required for a particular "batch" of material or sub-products to go through all stages of a process (FORMOSO; ALVES, 2000; SANTOS, 1999). Process cycle-time refers to the size of the examined entity (batch, work in process) and its leadtime (KOSKELA, 1997). In a general context, it is also possible to extract a part of the overall production process and to consider this as the focus for the reduction of cycle time (SANTOS, 1999). Cycle time can be further divided into setup time, describing all preparative activities, and throughput time, including all the time that is spent in processing activities (SANTOS, 1999). Koskela (1997) suggests the following ways to reduce process cycle times, by eliminating non-value-adding activities:

Elimination of re-work can be either achieved by classical quality measurements or an automation method using 100% inspection through autonomous checking of anomalies.

Waiting time elimination can be obtained by time reduction of setup times to reach one-piece lots in order to reduce lot-delays.

Elimination of moving and minimization of distances requires a process-based layout in order to reduce and minimize transport distances. For information processes this is less a matter of physical distance but rather of the means of transportation and types of interfaces (internet, post-mail, manual delivery, phone-calls).

Furthermore, Koskela (1997) lists a further seven implementation approaches:

- (a) changing the order of the process;
- (b) synchronization and smoothness of flows;
- (c) reduction of batch size;
- (d) reduction of work-in-progress;
- (e) reduction of variability;
- (f) solution of control problems; and
- (g) constraints to a speedy flow.

## Lean administration related to information process and procurement

Administrative processes and organizational functions occur in all organizations, both in the manufacturing sector and in the construction sector. The basic difference is that administrative processes in construction are especially related to varying and limited time horizons and locations, whereas in general manufacturing the processes are rather stationary (SANTOS, 1999).

Even though lean methods are widely spread in production in manufacturing industries, the associated organizational administration and service processes themselves are rarely performance-monitored (FORMOSO; ALVES, 2000). According to Tapping and Shuker (2003) and Wiegand and Franck (2005), only exceptionally are administration processes investigated for reasons of poor productivity, quality or performance.

Therefore Wiegand and Franck (2005) came up with the term “lean administration”, which is the application of lean management approaches and methods to the area of business processes, irrespective of whether they take place in a industrial company or in an organisation mostly involved in administrative work. Administrative processes can be measured by considering business processes as chains of activities, comparable to assembly processes in production (SANTOS, 1999).

Hereby, instead of tangible goods it is information that is investigated, and each piece of information (figure or value) is equivalent to an individual item. Information services and products managed through the use of new information and communication technologies must be centered in the users needs (REIS; BLATTMANN, 2004).

Wiegand and Franck (2005) state that an industrial approach to 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 thereby cut the processing time.

The same authors state that, in many companies and also in governmental organizations, the administration has hardly any detailed knowledge of the structures of individual processes and costs. Instead, there is often acceptance and trust that things have to cost what they cost, even though the quality of these services often does not meet customer expectations because of late delivery, incompleteness or faultiness (WIEGAND; FRANCK, 2005). This is also valid for construction, where the reliability of process lead times, scheduling and planning is low due to complexity and high uncertainty or inadequate management methods (KIM; BALLARD, 2000). This matter is not purely related to the production and information process itself, but also to organisational processes and information flows (SANTOS, 1999).

Therefore, a hierarchical view of process seems to be adequate, although an overview of the whole network of processes is also useful. According to Reis and Blattmann (2004), the hierarchical structure is essential for the identification of core processes and the systemic analysis of organizations: processes can be merged as macro-processes, but also sub-divided into groups of activities. The most appropriate level of aggregation depends on the type of analysis that needs to be done (REIS; BLATTMANN, 2004).

According to Wiegand and Franck (2005) there are inherent potentials of improvements in administrative processes:

- (a) after having identified the value-adding activities, emphasis can be placed on improving their existing flows. Differently from the traditional transformation model, which is strongly based on Taylor’s ideas, the focus is on eliminating non value-adding activities, rather than only improving the efficiency of transformation activities (KOSKELA, 1992). In a general information process context, the suggested measures for the optimization of these core-activities can comprise of the standardization of documents, data-forms and information input, automation of individual procedures and optimization of functional processes;
- (b) organizational activities correspond to non-value-adding but necessary activities, some of which are related to transport inspection or wait.

Once these activities have been clearly identified, the focus is to eliminate or reduce them either by means of different forms of transport (e.g. electronic data transfer instead of post-mail) or simplified controlling procedures by reducing these activities to a minimum; and

(c) secondary activities correspond to non-value adding and not necessary activities, i.e., activities that do not contribute to the value-stream.

Examples in information processing are twice-performed activities or follow-up questions due to poor data quality. Depending on the level of detail, this analysis can be done on an activity-based process analysis, as well as on a macro level.

## Research method

This study adopted a case study as its main research method due to the exploratory nature of the research problem. Although there was a theoretical framework regarding lean thinking and the procurement process, there was little understanding regarding the actual practice, at both at a strategic and at an operational level. The chosen scientific method enables the researcher to achieve the aim of examining and suggesting improvements in the overall procurement process. Such goal was achieved by adopting an analytical method based on the value-stream-mapping based on direct observation, validated by documents gathered from the case study and semi-structured interviews with key stakeholders (Figure 1).

The data collection in the field study was carried out in two phases, as described in the figure below. Prior to the data collection, the researcher established a direct dialogue with the main responsible for the procurement process (in this

case, the Head of the Department at Karlsruhe University), clarifying and agreeing on the framework of the study.

In first phase of the field study the researcher applied semi-structured interviews, focusing on the characterization of the procurement process as well as on the dynamics of the overall project management. This phase also involved gathering documents on governmental guidelines regarding the procurement process.

In the second phase, the researcher applied a detailed interview focusing on just one construction project in order to enable the development of a value stream mapping of the procurement process. This phase also involved gathering documents that provided evidence to describe the actual procurement process in that particular project.

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 on procurement procedures in governmental organisations as well as some discussions with lean management experts.

The analytical strategy focused on comparing the general process description derived from governmental guidelines with the reality at the Construction Department of Karlsruhe University; based on a value-stream map. Furthermore, the analysis looked at the opportunities to apply the principles and concepts of lean thinking that were identified during the literature review.

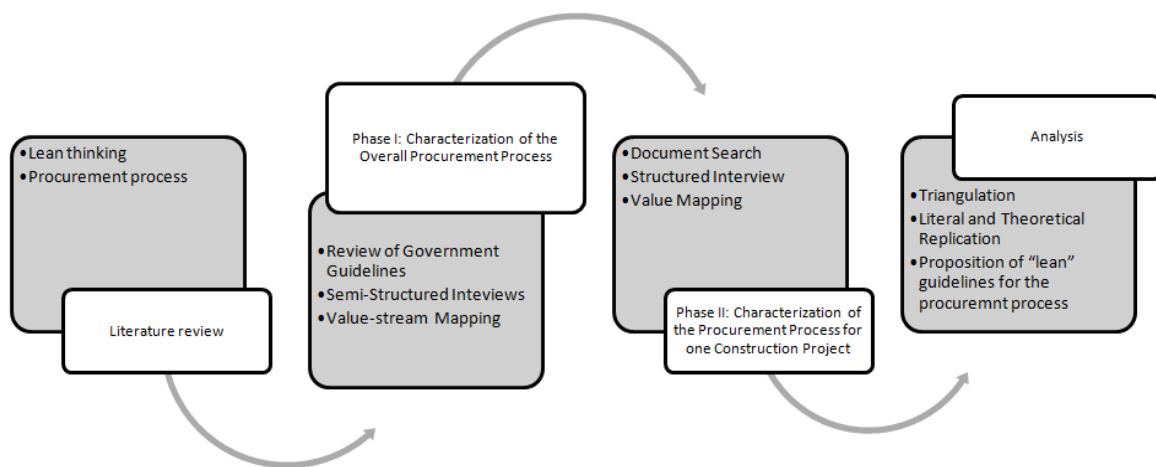


Figure 1 - The Research Strategy

## The procurement process at Karlsruhe University

By law, the German education system is based on 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):

- (a) the financial ministry of each state as the highest administration authority (Finanzministerium);
- (b) county control offices (Betriebsleitung, früher Oberfinanzdirektionen); and
- (c) local construction departments (Bauämter), split into real-estate management and construction management, some of them specifically concerned with universities (Universitätsbauamt).

This distinction into 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 2010 there were 18,245 students enrolled and 2,246 employees, according to an official publication by the head of the university. Therefore, the infrastructure of these education centres is within the scope of responsibility of the state government, including the management of real estate as well as construction and maintenance.

The construction department understands its own function as a governmental institution with the objective of providing and preserving real estate in form of buildings and offices for Karlsruhe University. The final end-users (students and scientific staff) are disconnected 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 from the construction department and from the central administration of the university is held on a quarterly basis to discuss technical and construction 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 state 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 million 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 in 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, who are the students and scientific staff (7). The procurement process is composed of eighteen consecutive phases, each of them related to one or several stakeholders.

The 18 phases can be grouped into five main phases of the procurement process:

- (a) pre-setup: demand formulation, verification of 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); and
- (e) delivery of the building.

According to the lean-approach of the Toyota System (SHINGO, 1996), it is important first to focus on the control of the process (flow of material or information) before starting optimization of single operations (flow of people or machines). This paper focuses on the improvements identified in the process, showing with reduced emphasis the implications of such improvements for the flow of operations.

Following lean principles, the eighteen mapped phases of the procurement value stream can be assigned to three different categories, illustrated in Figure 2: Value Adding (VA), Necessary but Non-Value- Adding (NNVA) and Non-Value-Adding (NVA).

Two NVA phases were detected, and they constitute the focus of this paper: the first one occurs in phase 6: “examination and check of the utilisation request”. These documents are checked twice, first by the construction department and secondly by a working group from the County Control Office. The second NVA occurs in phase 12, “Examination and check of the construction documents” done by the County Control Office.

The consideration of these two phases of the process as unnecessary and non-value-adding is based on two arguments: both stakeholders, the

County Control Office and the Construction Department work for the same ministry and their function is to represent the construction owner (financial ministry): there must not be double control within the same perimeter. Furthermore, for large projects, the construction document (Bauunterlage) is, in most cases, elaborated by freelance planners and architects due to lack of internal resources in the construction department. Therefore, the construction department already acts as construction owner and controls the elaboration of these documents. The second control of the County Control Office in this case does not add any value, but represents a time-consuming double check. According to the lean-principles and the goal of avoiding waste, some activities could be regrouped in order to eliminate non value-adding tasks.

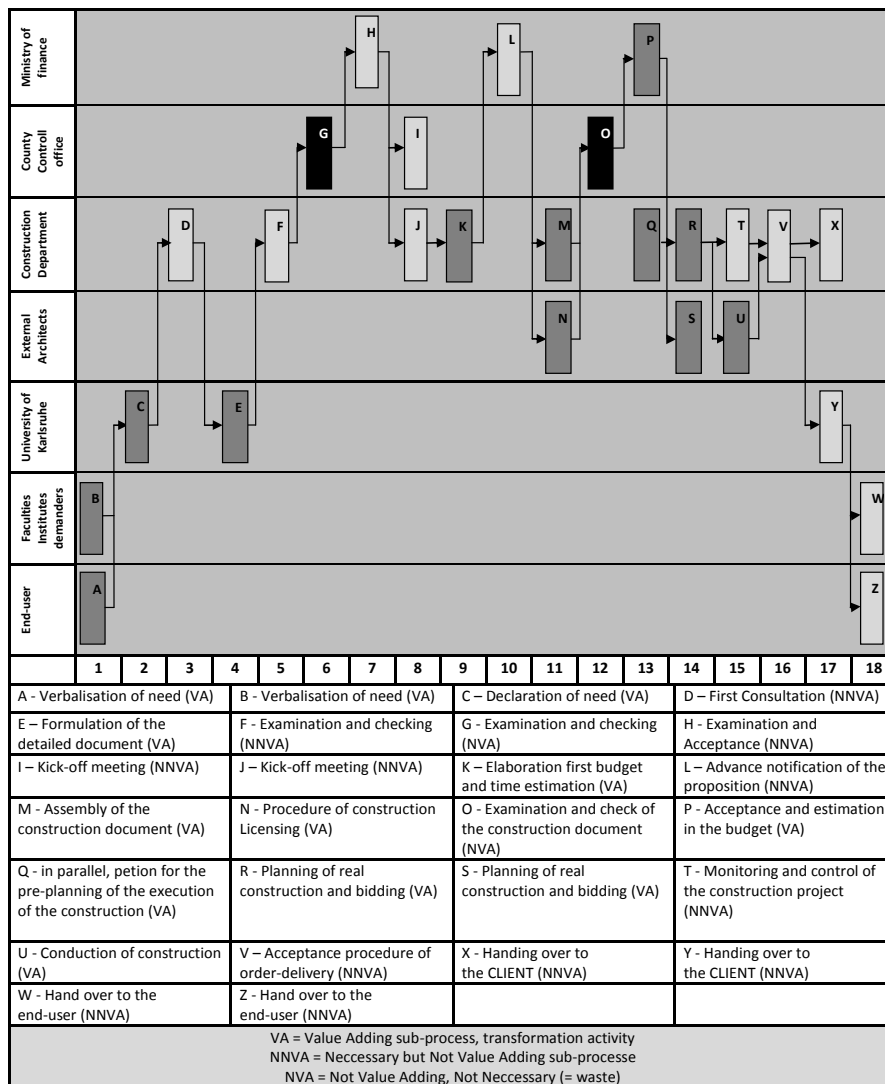


Figure 2 - The German procurement process for public buildings

Note: project size > 1.25 million Euro.

## Proposals for radical improvement in the German procurement process for public buildings

Based on the principles of lean thinking, the research study produced some proposals for radical improvement of the German procurement process (see Figure 3). These are divided into two parts with two process cycles: 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 monitor 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 by the state ministry, to provide this budget to the central administration of the university, and make the university owner and payer of the procurement of buildings.

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

Furthermore, the cycle-time for the budget allowance of the overall construction budget of Karlsruhe University is reduced to 0.5 years and kept constant, regardless of the 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. This improvement means, in practice, the reduction of work-in-progress at the county-control office, decreasing the amount of projects simultaneously under scrutiny. At Karlsruhe University this represents about 9-10 million Euros.

The proposal includes the enhancement of process transparency through better governance. The

proposition is to assign the ownership of the respective budget for projects that will come up to the central administration of the university in the next six months. End-users, i.e., 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 specify further details to enable the construction department to make a budget estimate. The target lead-time for the processing of this demand could be 4 weeks.

These improvements result in the procurement process represented on the next figure. The major changes are the following:

- (a) process ownership defined (central University) and closed process cycle;
- (b) process trigger: budget allowance from the financial ministry and project decision day at the university;
- (c) responsibility and budget management conducted by the University, which is considered to be closer to the “shop floor”;
- (d) - process cycle time defined (0.5 years) and predefined lead-time to pass through the demand-processing and budget estimation (4 weeks);
- (e) no need for a county control office; and

anticipation of budget allowance on a 0.5 year basis by the financial ministry, based on average budgets of former years and general education priorities.

All requests for projects, including the proposed budget and estimated duration, from the beginning of the year could be accumulated by the central administration of the University. By the end of the second quarter this entity should decide which requested projects should be executed by matching the available resources with the clients’ demands.

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



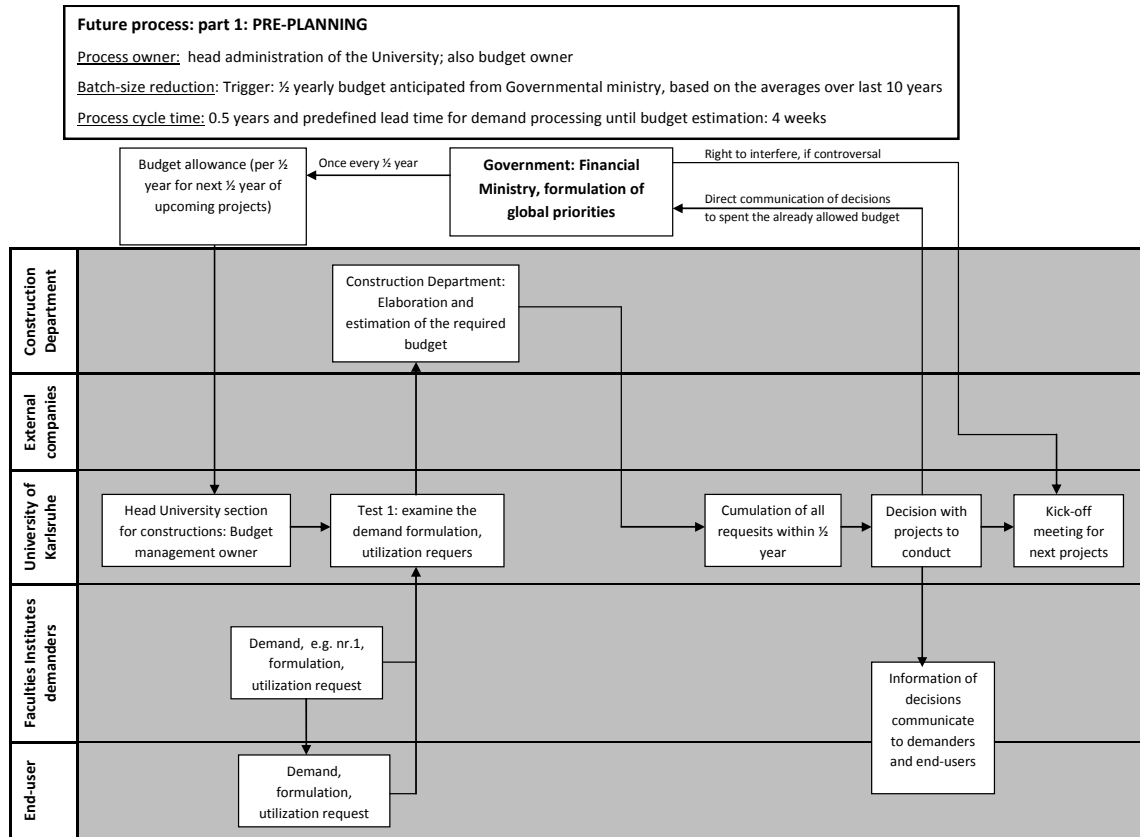


Figure 3 - Radical proposal for the pre-planning stage of the German procurement process: the case of public university buildings

The second part of the procurement process refers to the real planning; tendering, construction and delivery of one project (see Figure 4). In this proposal, the process owner is also defined to be the University, as being representative of the end-user and paying party, except for the part of the execution of the construction itself, which requires further expertise, provided by the construction department. As these projects cost over 1.25 Million Euro, there must be one person continuously working on each project and the responsible contact person, who is in charge of following and monitoring the whole process. The kickoff meeting sets up clear targets for time, cost and quality requirements that coincide with client expectations. This meeting is the trigger to start the real planning.

Verification of legal aspects and licensing are arranged in parallel with the gathering of construction documents, which is done either by the construction department or by external companies. At the same time, the University administration and its construction department select the best bidders according to the requirements and budget estimations. This result is also communicated to the public (end-users).

The construction execution, acceptance procedure and delivery to the end-users remain the same. However, in order to close the process cycle of each project, it is suggested that a concluding meeting is held between the construction party and the central administration of the University, in order to consolidate the learning process and to report the outcome to the Financial Ministry. The results can be used for continuous improvement, PDCA-cycles, indicators of reliability and benchmarking.

The suggested changes in this part are the following:

- (a) process and budget ownership defined: University (central administration, section construction);
- (b) no double acceptance of the project needed by the Financial Ministry and elimination of 2-year budget cycles;
- (c) end-users (faculties, scientific staff) are better integrated in the process (communication at 4 stages of the procurement process);
- (d) possibility to modify the demand until the latest stage;

- (e) clear information flow and responsibilities defined;
- (f) value-stream followed by the process owner; here one person is dedicated to following one project (pull information); and
- (g) closed process cycle: to organise a consolidation meeting at the end of each project in order to evaluate the project, capture the lessons learned and propose improvements for future projects. (Purpose: reporting, benchmarking, continuous improvement).

These proposals could present significant impact on the German procurement process. In fact, there is today no conscious link between final end-user and financing party (Financial Ministry). On the contrary, the stakeholders are disconnected from each other as procurement lead-times for investment projects amounting to over 1.25 million Euros are often higher than the cycle time of end-users at university, as an engineering degree has an average duration of five years.

Two other aspects of the current procurement process hinder the relationship between Government and End-user, preventing them from mutually benefiting from new investments:

(a) procurement-demanding party Approval: The procurement-demanding party (administrative head of the university) is responsible to approval 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 nowadays triggered on a 2-year mode. Therefore, projects often need to wait for the next budget cycle (two years) to overcome the next phase hurdle. In the meantime, the technology standards and requirements may change. An exemplary case was the procurement process of the new library building at Karlsruhe University, which took more than 15 years from demand formulation until delivery, with the construction period itself lasting only for 3 years; and

(b) Feedback about client satisfaction: Today, at the project delivery stage, there is no feedback from end-users to the financial ministry or to the construction department. According to the interviews, client expectations are met if there happen to be no claims. However, value can be created by increasing the awareness of the paying party, and of the developers of the project, regarding the project’s objective and the end-users, and simultaneously by introducing a learning process based on experiences and creating continuous improvement.

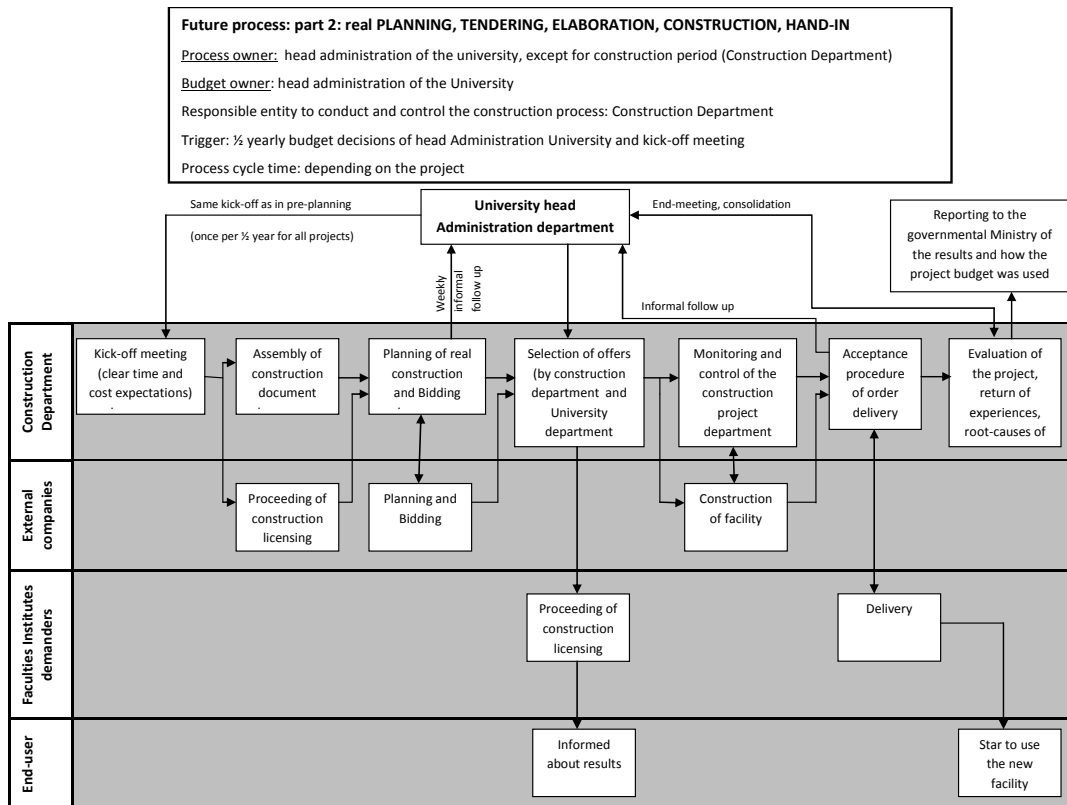


Figure 4 - Radical proposal for a better German procurement process: case of university public buildings

It is necessary to have a clearly defined process owner, which in this case is 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 (in this instance, the scientific staff). Furthermore, the responsibility has to shift from a top-down hierarchical approach towards a more autonomous model with proper budget management at lower hierarchical levels (the university itself instead of the financial ministry). The universities should be themselves responsible for deciding and prioritizing certain construction projects, as they can more easily and accurately 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 at high level, in governmental ministries. On the shop floor, each project is closely followed by one person who is dedicated exclusively to that project.

Alterations and changes in the demand can be made throughout the entire process, as the University itself (central administration) is the process owner and it is responsible not to exceed the overall university budget. It is also proposed that the university should have the right to accumulate non-used budgets up to two years in order to have more flexibility and avoid spending budgets within two quarters, only to avoid losing money in the next budget allowance.

## Conclusion

The objective of this research study was to get and insight into the current German procurement process for public buildings, based on a case study, and to perform a critical analysis and offer proposals for more radical improvements. Mapping the current value stream unveiled 18 sequential phases and carried out by 7 different stakeholders. The procurement process, from the demand formulation to 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.

This case study showed a situation where a governmental administration is considered to be a controlling institution and cost centre rather than a service provider. This mindset is reflected by governmental actions like constantly cutting the number of employees in their construction departments over the past few years, in order to cut costs, and hence purporting to be practising “lean”

administration. As construction budgets remain constant, external freelancers need to be hired. This actually increases the complexity of the procurement process due to compulsory public tendering for each project and sub-contract amounting over 7,500 Euros.

The results of this study demonstrate that the lean principles have not yet been applied in the governmental organization studied. This first proved to be true as even the term “lean-management” was unknown to the interviewees, and second through the results of the mapping out of the current procurement process. The procurement process for public buildings (large scale construction projects) is not currently designed according to the value-stream, it contains a lot of waste, long cycle times and it also lacks process transparency for the stakeholders. This study detected several points for possible improvement through the application of lean principles. Process mapping and value-stream mapping showed waste potentials and how to focus on value in procurement.

Hence, the authors propose a restructuring of the entire process, translating lean principles into a more innovative procurement process, based on the Womack and Jones’ (1996) principle of value creation. By changing the focus to the customer, the process was simplified, and resources allocated towards the elimination of bottlenecks in the process, in order to achieve better process flow, higher transparency and shorter cycle times

Therefore, the challenge is to convince politicians and decision makers to change structures of responsibilities and to apply 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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