

# Life Cycle Management of Public Estates With a Focus on Universities and Research Institutes

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## **Project Management:**

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## **Aim of the project**

Due to the federalistic reform (Föderalismusreform) and the abolition of the higher education building aid law (Hochschulbauförderungsgesetz HBFG), as well as the implementation of bachelor/master courses (Bologna process) and student fees, augmented autonomy for a small number of higher education institutions in only a few federal states and against the background of a massive reconstruction backlog, the German research institutes and higher education institutes (universities and colleges) face numerous organisational and economic changes and a range of new challenges. Hence the increase in the competition for financial resources and students and calls for more efficiency in the allocation of resources.

The cumulated construction, reconstruction and financial demand in the German higher education sector has led to the awareness for the need of a value-oriented life cycle approach in the sector's real estate management. It is therefore the aim of this report to analyse, compare and evaluate not only the financial and legal framework on state and federal level, but also the different organisational types of real estate management. The report's objective is to identify examples of best practice of value-oriented life cycle management for the purpose of efficient planning and delivery of higher education buildings.

One possible way to establish a real estate life cycle management is by applying the procurement model of public private partnership (PPP), a delivery mechanism for infrastructure projects in various sectors on local authority, federal and state level with private sector involvement. This alternative route to pure public sector procurement also ought to be considered for the delivery and operation of higher education real estate. Nevertheless, in regard to the specific organisational structures and the technical and user-determined endowment of university buildings, the application of PPP in this sector demands particularly elaborate planning. Against this theoretical background, there is almost no practical experience with PPP in the national university sector to refer to and only a few international ones. In addition to lack of PPP experience, the German higher education sector lacks comprehensive building- and user-specific data, which is a precondition for a valid value-for-money analysis especially in this sector of extremely high complexity. Thus, the report analyses, structures and evaluates currently available sector data.

Given the current debate on the transformation process the German higher education sector faces, the overall aim of the research project is to identify compulsory change processes in the estate management, i.e. turning from hitherto state administration to property ownership and management by the institutions themselves. In this context, the project seeks to give a comprehensive but concise overview of estate management in the higher education sector. Particular attention is paid to the political and legal framework, organisational structures, funding mechanisms, planning procedures and the distribution of responsibility in and among the numerous organisational units. The research project aims at developing guidelines for the adoption of life cycle estate management and - being one possible method of life cycle management - of PPP. The latter has been carried out by scientifically conducting PPP projects in their (pre-)planning stage. These projects

were selected by higher education institutions which had claimed a substantial interest in the research project in advance and were willing to break new grounds by exerting PPP.

In addition to this, the report aims to develop a data structure model which contains the crucial data elements needed to support a robust value-for-money analysis, subsequent decisions for the form of procurement as well as potentially succeeding construction, reconstruction, conversion and/or operation processes.

### **Methodology and structure of the report**

The report is divided into three major parts representing three levels of analysis. Part 1 gives an overview of the basic structures and key characteristics of estate management in the German higher education sector. On the basis of a comparative evaluation, recommendations are made with regard to value-oriented estate management in this sector.

Part 2 concentrates on specific PPP projects of higher education institutions. The projects' features as well as their legal and organisational setting are outlined for the reader. For each project, a PPP screening test is carried out. The test results reflecting the preliminary PPP feasibility are presented, discussed and evaluated.

Finally, part 3 is subdivided into the analysis and evaluation of existing data and operating figures for life cycle estate management in the higher education sector, and secondly into the development of a data structure model, differentiating building- and user-specified life cycle costs. Therefore, a number of interviews were held with representatives of higher education institutes' technical departments. Furthermore, existing data tools were looked at and, with regard to their abilities, evaluated. Containing the corresponding data, the developed data structure model ought to enable universities and colleges to reach decisions on investment and the form of procurement.

In addition, the interim results of the research project were presented and discussed not only with the participating higher education institutions but also with other interested parties, e.g. delegates from state and federal administrative bodies as well as student unions:

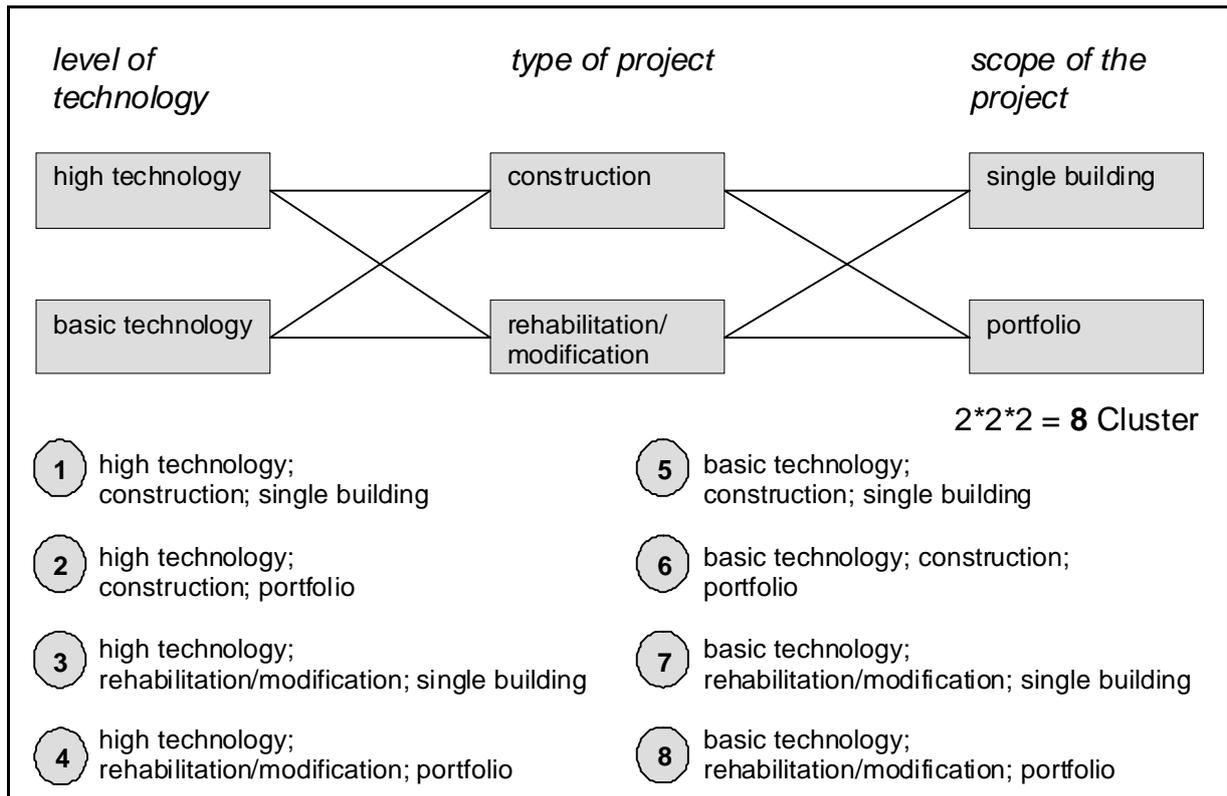
- 21.11.2006 Workshop “PPP in the Higher Education Sector”, Hanover
- 21.03.2007 Workshop “Higher Education Institutions”  
in the course of the”  
“7. Business Administration Symposium-Construction”, Weimar
- 12.06.2007 Workshop “Life Cycle Estate Management of Higher Education  
Institutions”, Hanover
- 04.10.2007 Workshop “PPP-Eligibility of Higher Education Projects”, Weimar

### **Results of the project**

Having analysed the state and federal higher education policy, it has to be concluded that the application of the life cycle approach in the management of public estates and thus the higher education estates depends largely on the political, legal, organisational and economic framework to be found in each federal state.

Also, the higher education sector obtains specific key characteristics, which has led to the perception that the sector’s estates are highly heterogeneous. For the purpose of the intended classification of the observed PPP projects, the different types of higher education estates were clustered. Several distinctive features between the estates and between the PPP projects were chosen: the level of technology (from low to high), the type of PPP project (construction or reconstruction) and the project’s scope (single building or portfolio).

The following figure shows the clustering method:



**Figure: Clustering**

The higher education sector is regulated by a number of state and federal laws. However, with the withdrawal of the state from higher education policy, a transformation process has begun, implying amendments of state laws as well as subsequent changes of federal higher education laws, as was stated above. Altogether, these legal actions aim at strengthening the funding responsibility of the federal states. As a consequence, a small number of higher education institutions have been granted more or less extensive autonomy. The degree of economic and legal autonomy depends on the regulatory changes which vary from transfer of owner responsibility to - in a few cases - the shift of property ownership to universities and colleges combined with the transfer of related construction personnel and budget.

The table below shows the current estate management models in the German higher education sector:

Model	Estate Management	Planning & Construction	Maintenance	Operation	Distribution Federal States*
1	State Company	State Company	State Company	State Company	1
2	State Company	State Company	State Company	University	6
3	State Department	State Company	State Company	University	2
4	University	State Company	State Company	University	6
5	University	State Company	University	University	2
6	University	University	University	University	4

\* Total of federal states more than 16, due to parallel estate management systems within one state

**Table: Distribution Estate Management Models within Federal States**

As is presented in the table, in parallel to the conventional/classic organisational model where the federal state owns and funds and the universities and colleges operate the higher education buildings, deviant organisational models exist. However, merely four federal states have allowed higher education institutions full autonomy over their estates' life cycle. But even in these partly time-restricted, pilot schemes, the institutions remain dependent on state funding. Furthermore, they are obliged to obtain approval by the state department whenever they want to take out a loan or sell their estates. Still, these more autonomous universities and colleges are assumed to be more eligible to apply alternative procurement processes than the conventionally organised ones. The passing of the PPP acceleration law (ÖPP-Beschleunigungsgesetz) in 2005 and the PPP simplification law (PPP-Vereinfachungsgesetz) which is under way generally ought to ease the decision for PPP in all sectors. Notwithstanding and in consequence of the continuing financial dependency, most German higher education institutions do not - or more precisely are not able – to pursue PPP with priority for new construction or reconstruction tasks. In the near future, the universities' financial setting may change with the generation of optional funding from student fees, fundraising etc. So far, user financed higher education estates are solely found in the student unions' field of activity, e.g. student accommodation or cafeterias.

In the long run, PPP will only be a substantial delivery option in the higher education sector if the bundling of the responsibility for property and budget is going to succeed. This can be achieved by transferring the liability for planning, construction and the estates' operation to either

- the institution (university, research institute, student union),
- a property management or
- a higher education real estate company

The selection of the adequate option depends on each university's or college's regulatory circumstances as well as its specific characteristics such as size and scope of administrative and technical personnel. Still, no matter which of the above alternatives is chosen, it is necessary that full economic and legal responsibility is assigned. Given the described restrictions, the transformation to life cycle estate management and/or the substantial use of PPP in the higher education sector will presumably take time. In contrast to the German case, the international analysis has displayed a significant number of PPP projects in other foreign higher education sectors, especially in the United Kingdom.

With respect to the participating higher education institutions, each potential PPP project was examined by a PPP screening test, an initial feasibility test on the basis of a checklist which in turn consisted of the following parts:

1. Project characteristics,
2. Legal, financial and organisational framework
3. Project specific parameters.

The screening involved the criteria given below:

- Financial Feasibility,
- Legal Feasibility,
- Project classification within portfolio,
- Scope and elements of service,
- Project volume,
- Market interest,
- Payment mechanisms,
- Risk distribution.

After the PPP screening test was completed for all of the 13 projects, the results were presented and handed over to the respective higher education institution. Herewith, a first qualitative assessment of the projects' PPP feasibility has been carried through and prospectively enables the higher education institutions to screen future projects themselves.

Besides its use as a PPP feasibility check, the screening test was found to be credited additional benefits:

- it serves as a project designing instrument,
- it reveals inherent need for action,
- it may be useful for necessary political alterations
- and eventually, it leads to an advance in knowledge by all closely and loosely involved project participants.

For the majority of the examined projects, PPP feasibility has been ascertained, albeit with the constraint of financial feasibility, due to lack of funding commitment by federal state departments. Two out of thirteen cases were not proven PPP eligible. Here, restrictive project specific circumstances such as being a listed building were detected as obstructive factors which likely would reduce the scope for innovative market solutions and thus the chances for efficiency gains throughout the life cycle of the higher education estates.

The subsequent evaluation of the different contracting models has shown that, in the majority of the examined cases, the DBFO (Design Build Finance Operate) type of PPP model where the construction and operation are procured by the private sector, but where the property ownership remains public, is widely applicable by the higher education institutions.

The result of the projects' analysis is, for once, that PPP not only is one possible approach to establish a life cycle estate management in the higher education sector, where public decision makers can learn from private sector participants. Also, leaving the current regulatory restrictions aside, a considerable potential for PPP in the German higher education sector has been identified. In view of the preliminary national and international experiences with PPP in the school sector, an increase of efficiency and effectiveness in the higher education property management may tentatively be presumed.

Notwithstanding, the crucial basis for further planning of the evaluated higher education projects is detailed building- and user-specific data which allows both the public entity and the private bidders a long-term cash flow forecast by calculating the public sector comparator (PSC) and value for money (VfM). This precondition of documented life cycle costs was not found in any of the evaluated projects. On the contrary, most of the participating universities and colleges possess only highly fragmented construction and operation data of their portfolio due to the conventionally split responsibility for delivery and maintenance of higher education buildings.

All and all, the collection of qualitative and quantitative data of life cycle costs is not only essential for decisions on the type of procurement (and hence for the implementation of PPP), but also builds the foundation for life cycle estate management in the higher education sector. Against this background, the report concludes with a data model which provides a structure to collect life cycle data, indispensable for cash flow forecasts and cost controlling.

Unfortunately, within this project it was not possible to carry out a PPP screening test for a research institute. One reason for this circumstance may be due to the different economic situation of state funded research institutions like Fraunhofer and Max-Planck which are sufficiently financed and thus not indigent for optional procurement.

Given the increasing withdrawal of the state from higher education policy, future need for research is seen in the analysis of optional funding for higher education institutions concerning their unmet need for construction, reconstruction and conversions.

Finally, in the field of financial engineering, future research is suggestive with respect to the analysis and standardisation of financial instruments, the distribution of risks between the public and private sector as well as cycles of maintenance. Also, it would be interesting to have a closer look at the chances for packaging of PPP projects in order get access to alternative financial instruments such as REITs or higher education funds.

Additional need for research is seen in the development of specific instruments for adjustment of the output which are particularly caused by new challenges in research and teachings in the operation process.

Based on the developed data structure model, the costs of investment, operation and risk should be identified and arranged evaluating empirical data. In this future research the conventional delivery option should be considered as well as projects with private participation.