

Technical University of Denmark



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# DTU says yes to operational friendly building but how should it be done in practice?

By Helle Lohmann Rasmussen, Susanne Balslev Nielsen and Anders B. Møller

Facilities managers often fight to be allowed to contribute their operational experiences to new building projects, but not at Campus Service of the Technical University of Denmark (DTU), where “ask the operations manager” has become a mantra for every building project in recent years, and there are currently 15 building projects under way. But how is this knowledge transfer organized in practice so that both the buildings department and the operations department maintain a good and effective relationship?



Helle Lohmann Rasmussen

## Operational knowledge for building

Knowledge transfer from operations to new construction is a current topic in the building sector and is expected to contribute to increased quality in building. DTU has been a major builder in recent years and with its own operational organization has good prospects for transferring knowledge from operations to new construction. At DTU's FM organization, Campus Service (CAS), the potential in assimilating operational knowledge was seen a long time ago, and development in the area is rapid. For example, the CAS approach attracts



Reference card session with building management department

multi-builders such as municipalities, pension funds and others who have concentrated operations and new construction in one organization, or who are trying to achieve operational friendly construction and redevelopment.

This study, based on a long series of recommended approaches to ensure knowledge transfer from operations to construction, looks at how CAS specifically works on the topic and what barriers make the effort more challenging. The programming phase is considered by many to be the most significant phase to help operations and maintenance, and it is in this phase that the study was carried out.

## CAS in development

There is considerable knowledge of operations in CAS and there is

great ambition to use this knowledge in new construction. However, it was apparent when new buildings were taken over in 2012 that the buildings were not as operational friendly as desired. This experience has led the staff and management to adopting a greater focus on developing a CAS approach which integrates operational knowledge into DTU's buildings. The challenges in integrating operational knowledge in construction projects include bringing in the right people, making decisions at the right management level, looking for the right knowledge, and delivering the knowledge required in the right form and often within deadlines that conflict with other pressing tasks.

Starting with Helle's own experiences as the project leader in the operations department followed by interviews with representatives for the building and operational organization and analysis of two specific building projects, a picture has taken shape of which researched approaches are used in DTU, which approaches are found to be effective and functioning well and which are not yet thought to be working well. The results can be seen in figure 2.

The study shows that CAS already uses many of the approaches recommended in FM literature and even approaches not described in the literature. Thus, CAS appears to have come a long way with the work and the buildings that are now being devised are integrating operational knowledge to a high degree. Approaches such as a detailed building plan, a plan for inclusion of operational knowledge of the individual projects and requirements for reduction of energy and use of resources are fully incorporated in the planning of the construction projects. Other approaches are being used but do not seem to have found the right form yet. However, obstacles are being encountered in the use of the methodologies and it is not clear

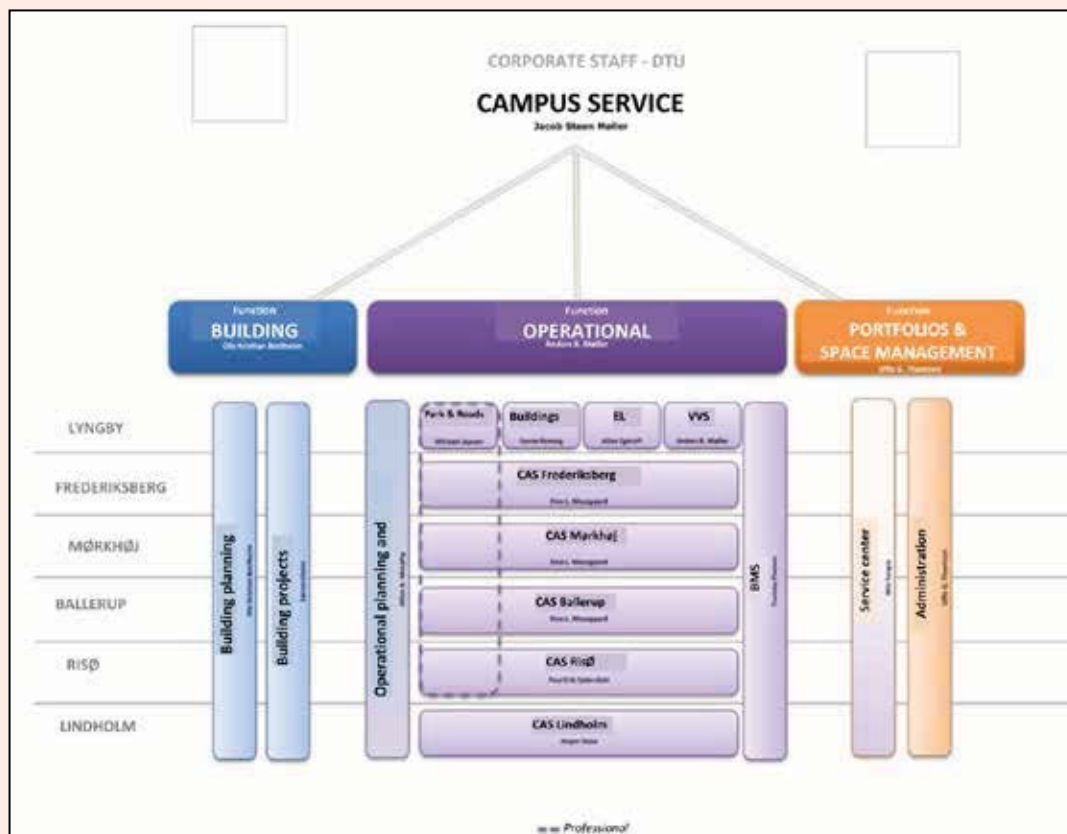


Figure 1: Organizational chart, DTU Campus Service

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## Project Financing: the great forgotten solution

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how consistently they are used. There is potential for more operational friendly constructions in CAS by amending these approaches, and it appears that some of the approaches are unnecessarily resource-intensive in their current form.

### Continued development

The study identifies three approaches that CAS is advised to implement first. They are:

1. FM commenting and scrutiny,
2. standards for DTU construction and
3. requirements for operational friendliness in the construction programs.

These are approaches that are already quite developed, but with adjustments they are expected to give a marked increase in transferred knowledge. The clear distribution of roles and responsibilities and clear prioritization of operational friendliness are hallmarks of the changes.

In addition to proposals to improve approaches at an operational level, the study also gives rise to considerations related to the nature of the leadership. Attention is drawn to maintaining a balance between the management paradigms: bureaucracy and relationships. A stepwise development with a high degree of involvement, supported by clear agreements and guidelines, can be a successful route. The study also indicates that the operational strategy for knowledge transfer to the construction projects is centered on the leaders of the operational sectors. It is important that this strategy is clear to the whole organization, and that the operational organization's role in the projects is delegated to the section managers.

The study also indicates that in both the operational and construction management departments a great effort is being made to transfer knowledge from operations to new construction, but that to a varying degree, and entirely in accordance with the findings in the literature, obstacles are encountered with the transfer.

From the perspective of the operational manager, a change in the FM role is taking place at DTU. Decisions are now made with a more long-term perspective and an ambition to find solutions that benefit DTU as a whole. Top management pays greater attention to the long-term operational costs and use of resources and they protect interests associated with long-term ownership. Therefore, it is greatly welcomed that the results are starting to show that new buildings are more operational friendly than those which CAS took over in 2012 and the sections are clearer about the expectations of their tasks

relating to the transfer of operational knowledge. The knowledge transfer is a work in progress. Although not yet concluded, there is a good deal to suggest that CAS is on the right track.

### Conclusion

This article is written as a challenge to develop strategies and processes where relevant for a constructive and effective dialogue between the leadership, operational management organization and building management organization on operational considerations in the planning of buildings and reconstruction. It may be useful to distinguish between the organization skills that we want available and that of the specific construction projects and project-determined objectives and requirements for operational



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friendliness. As shown, CAS is well under way in improving in this and by sharing these experiences and we hope to inspire others to test and to develop their own processes and approaches.

### Approaches that work well

The following lists the approaches which work well according to the study.

- Detailed building plan (B)
- Ongoing programming (B)
- Plan/agreement of operations involvement in every project (B)
- Requirement in the program on working environment (B)
- Requirement in the program on minimization of energy and use of resources (B)
- Requirement in the program on flexibility (B)
- Professional building management organization (Management)
- Operations represented in management group (Management)
- FM seen as strategic discipline at DTU (Management)
- Cross-cutting arrangements in CAS encouragement relationships (Management)

### Approaches used but can be improved

- Clear prioritization of operational friendliness in CAS (Management)
- Clear strategy to include operations (Ops)
- Requirements that ought to be included in the building program to allow future operational friendliness (B)
- Standards for DTU building (Ops)
- Use of total economy in selection of solutions, including for changes (B)
- Internal comments (Ops)
- "Bridge-builder"/FM contact person (Ops)
- Requirements for O&M materials / plan for use of inputs (Ops)
- "Safety net" for poorly-timed comments in projects (B)
- Requirement in the program for delivery of O&M material (B)
- Relationship-building approach between the operational management and external advisers/entrepreneurs (B)

### Approaches which CAS states are to be added

- Ongoing Commissioning (Ops)
- Requirement for operational budget and plan (Ops)
- Clear borders of responsibility (Ops)

### Further relevant approaches not currently in use

- FM scrutiny (Ops)
- POE (B)
- Introduction to building design for operational staff (Ops)
- Use of guides to the area (B/Ops)
- Limits to expertise/further training, e.g. in FM scrutiny (Ops)
- Divided project leadership (B/Ops)

Figure 2: Overview of approaches for the transfer of operational knowledge to building projects and their use at DTU. It is noted in parenthesis who should hold responsibility, even if several parties should contribute. B = Building department; Ops = Operations department; Management = Management group/other management

Campus Service has the objective of operating, maintaining and developing DTU's buildings, areas and facilities, and ensuring that researchers, other staff and students have the best possible physical working conditions.

The aim of the work of Campus Services is that DTU's buildings, surroundings and facilities are seen as attractive by the staff and students, but also that other citizens, companies and society see DTU and its facilities as an active establishment that they are glad to use and work with.

DTU has institutes spread over 17 locations in Denmark and Greenland. Campus Services has permanent staff at 7 of these locations: Lyngby, Risø, Mørkhøj (Søborg), Frederiksberg, Ballerup, Lindholm Ø and Århus.

In addition, Campus Services supervises the building activity at all other DTU locations.

### Facts about 2013:

FTE staff in the year: 189  
Turnover: DKK 931 million (distributed between operations including salaries for the whole of CAS – DKK 672 million and operational expenses – DKK 259 million)

### Links for more information:

1. DTU Campus Service  
[http://www.dtu.dk/Om-DTU/Organisation/Administration/Campus\\_Service](http://www.dtu.dk/Om-DTU/Organisation/Administration/Campus_Service)
2. Value Creating Construction Process  
<http://www.vaerdibyg.dk/>  
Center for Facilities Management  
<http://www.cfm.dtu.dk>