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Facility Management Cost in the OR-a Process Model

Through the implementation of the German Diagnosis Related Grouping (DRG) system and the resulting cost pressure, the need for optimised use and operation of the spatial resources in hospitals is growing. The link between primary processes and facility management services however, appears to be missing. In the framework of the research project OPIK – optimisation and analysis of processes in hospitals, at the Institute for Technology and Management in Construction, Facility Management at Karlsruhe Institute of Technology, the interdependencies between facility management performance and costs, and primary processes in the hospital have been analysed.

A Process-Oriented Cost Model

The treatment of a patient in the hospital can be described as a clinical path that is interpreted in terms of space. Figure 1 illustrates such a clinical path. The patient's journey through the hospital follows a certain path, symbolised by a black line. Along this path the patient is using the specific functions of the different facilities in the hospital. In relation to the function of each facility, infrastructure services are used to a certain extent, symbolised by the grey circles. On a spatial level, primary and infrastructure processes are linked through the functional units (the facilities). The focus is set on the patient and his presence in the functional unit. Any performance is related to the patient. This relationship between FM (Facility Management) services and primary processes can been described in a mathematic process model.

The defining feature of the model is how it describes the relationship of all core infrastructure processes to a primary process profile. Thus a value from the primary process has been assigned to each relevant main facility management process.

One of the most important functional units of the hospital is without doubt the OR (or operations unit). In the OR the dominant cost process is the sterile goods supply which is discussed in the example below. The results are based on the analysis of empiric data of four German hospitals.

Sterile Goods Supply in the OR

Figure 2 shows the average cost shares of the facility management processes for the operation unit based on a sample of four German hospitals. 39% of the cost is related "sterile goods supply". This is the dominant process in the operation unit.

Cost Driver

The relationship between primary and FM processes can be separated into fixed and variable costs. The product "sterile goods supply" is at variable cost. When increasing the operation time of the operation unit from one shift to two shifts per day and assuming that there is a similar workload, it may be assumed that these costs will double in a linear manner.

According to the standard set by the German Institut für das Entgeltsystem im Krankenhaus (InEK) the allocation base and therefore abstract cost driver of the cost of the medical and non-medical infrastructure in the operation unit is the time between first incision of the skin and last suture, plus the setup time for each operation (DKG 2002, appendices S.20).

This approach is simplifying in assuming that all infrastructure costs are in linear dependency to the length of the operation. Time is the only cost driver. For a transparent analysis of costs and for the purpose of benchmarking and optimisation of FM products, the relation between cost and cost driver has to be examined in more depth.

Does an operation of double the length really mean a doubled effort for sterilisation and packing of the surgical kits? The cost driver for sterile goods supply is rather the number and the content of surgical kits, i.e. the kind of operation, than the procedure time. A problem is when large surgical kits are being opened for the use of just one or two pieces. The unused content has to be sterilised and repacked nevertheless. To avoid this unnecessary effort there has to be good communication between surgeons, medical personnel and the sterilisation department. For standardised operations standardised surgical kits should be not only available, but also frequently used, and the documentation should be made available for facility management purposes.

The average cost for sterile goods supply for the operation of a hip joint in 2005 based on the data of four hospitals was about 190 euros with an average number of sterile goods entities of 5.5. The average cost for sterile goods supply for any operation is only 58 euros. This cost difference

can be related to the average operation time including set up times for a hip joint: the reference time is about 190 minutes. The average operation time for the different operation portfolios in the hospitals of this research's sample varies between 72 and 165 minutes. Considering the possible time span of operations and the cost differences for sterile goods supply for a relatively short but complex kind of operation, as it is in case of a hip joint surgery, the need for transparent, realistic cost allocation becomes apparent.

The researchers at Karlsruhe Institute of Technology are developing a model that allows a realistic cost allocation for FM processes in relation to the primary processes. Thus the model can be used to simulate consequences of changing primary process portfolios on the hospital infrastructure. According to a portfolio profile, utilisation times of the different functional units can be derived, as well as the need for function specific secondary services. Thus, capacities may be planned and optimised. The model is an important step towards cost transparency and gives a very important basis for strategic planning of space and resources in the hospital.

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German DRG System

"Diagnosis related groups (DRGs) are a patient classification system, which relates in a clinically relevant and traceable way, the type and number of patients to the consumption of resources in the hospital."

(Definitions handbook G-DRG 2006, Band 1, S.1)

Patients are grouped by main diagnosis and other factors (i.e. age, gender, operative procedures) and then classified. A hospital is remunerated for a patient according to a cost relation by a fixed lump sum based on average costs. Since the introduction of this system, the average length of stay of patients has diminished from above 12 days to less than 8 in Germany. Growing competition led to a shrinking number of hospitals from about 2,340 in 1994 to nowadays less than 2,100. The share of private hospitals grew in this period to nearly 30%.

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