

Cost allocation for FM services in hospitals

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Abstract

The interrelationship between service performance, quality and costs is mainly customer driven. In most cases – as so in hospitals – the feedback between customer and service provider in the form of a price for a performed service is missing. ‘Customer’ in this context is not only the contracting body but the area of operations that is supported by Facility Management (FM) services. This paper presents a cost allocation system for FM services which is based upon the idea of products measurable in value and quantity. Through this system transparency is generated and the customer-provider relationship is strengthened. But most of all savings are generated without negative impact on the quality of the core processes.

Introduction

Facility management cannot prevent people from getting sick. But once it has happened, FM can support the cure process in hospitals. The provision of FM services is an extensive assignment – especially in healthcare facilities. In order to emphasize the value of these services, often not only the benefit of these but the additional advantages coming along with them is pointed out. In this case, the term of ‘added value’ of FM is used. However in German hospitals it is far too early to question the ‘added value’ of FM. An ‘added value’ can only be determined – and that implicates the term itself – if the value is already tangible. Therefore the value itself has to be established first. Consequently it has to be determined of what importance FM in hospitals is for medical processes and how this can be assigned with a value. Importance is a result of benefit and benefit is the result of needs that are fulfilled. It is essential to establish the needs of medical processes in hospitals in order to clarify the importance of FM in hospitals and in the end be able to quantify its primary value.

In order to discover the medical processes needed for supporting services it is necessary to subdivide hospital processes into medical – so called core processes – and non medical – so called non core processes. From the facility manager’s viewpoint all services prescribed by medical personnel are core and therefore all services not medically indicated are non core. Taking these non core processes into consideration it is imperative to keep the focus on the medical personnel’s needs and with it on the customer.

A real determination of FM services value by market means under given circumstances in hospitals is only partly possible because supply and demand can interplay without drawbacks only in some areas. Nevertheless expenditures can be subsumed in products supporting the customer in its service provision in order to create a transparent value. Where these expenditures can be found, how they can be merged in products and how these can be integrated into existing cost allocation systems is the content of this paper.

Theoretical background

Cost accounting

Regarding cost accounting Wöhe [Wöhe, 2002] states “the purpose of cost accounting is the registration, allocation and objective attribution of costs that are the result of the operational output and exploitation in order to:

1. create a basis for the operational disposition through determination of expected arising expenses (decision oriented prospective accounting) and
2. discover the reason for bad performance that can lie within the planning or production sections, through determination of plan variance by comparison of actual expenditures with costs planned before (controlling)”

The focus within this approach lies on the overall company and the associated sales and orders. Facility management however is a secondary service which is mainly allocated internally. The depiction of these complex allocation procedures requires a precise application of basic cost accounting methods.

Cost-type accounting

The basis for cost-type accounting is questioning which costs have accrued. The cost-type accounting differentiates only regarding the origin of costs independent of the use of these factors of production. [Wöhe, 2002] In German hospitals the frame for structuring cost-types is predetermined by the ‘Krankenhausbuchführungsverordnung [KHBV, 1997]’ (hospital-accounting-decree). The appendix of this decree gives a detailed structure of cost-types especially for medical sections. (cp. [Hentze and Kehres, 1999]). Hentze et al. state: “Objective of the sample cost-type catalogue is to define and standardize accounts and their contents and thereby make the figures of different hospitals comparable especially regarding performance

and calculation lists". This makes clear that through cost-types a comparison with third parties is supported but a statement about efficient operation of factors of production is not possible.

Cost-centre accounting

The focal point of cost-centre accounting is the location of origin. Based upon cost-type accounting, costs are allocated to different company sectors. (cp. [Wöhe, 2002]) Wöhe further mentions the "exact allocation of overhead costs towards cost drivers" as the essential purpose of cost-centre accounting. The second task assigned to cost-centre accounting according to Wöhe is controlling. The cost-centre accounting can therefore be seen as an intermediate step in the direction of cost-driver accounting.

Cost-unit accounting

"Cost-unit accounting asks: for what reason [have] costs accrued? Its function is to allocate production and original costs that arise during production of marketable or internal services (cost-units)" [Wöhe, 2002] If certain cost-centres are only availed by specific cost-units, the cost-unit accounting can allocate overhead costs corresponding to this specific utilisation. Most commonly this distribution is considered as a proportion of overhead costs.

Activity based costing

Besides the aim that all cost accounting systems pursue as has been formulated by Wöhe, activity based costing considers single activities that are the cause of costs. Through the differentiation of activities in hierarchy levels as proposed by Kaplan and Cooper [Kaplan and Cooper, 1999], the consideration of different processes and process flows is possible for prospective accounting as well as for controlling purposes.

In German hospitals the emphasis lies on cost-centre accounting and not on cost-unit accounting. For instance, in comparison to Wöhe the function of cost-centre accounting is defined in hospital accounting literature. Whereas Wöhe names the allocation of costs on cost-units as the main purpose of cost-centre accounting and only secondly its controlling function, Hentze et al. [Hentze and Kehres, 1999] speak in the first line of its controlling function and only at third rank of the preparation for cost-unit accounting:

"Cost-centre accounting serves three fundamental purposes:

1. Cost-centre oriented control of economic efficiency
2. Controlling of cost-centre based budgets
3. Preparation of cost-unit accounting" [Hentze and Kehres, 1999]

As an argument for this sequence Hentze et al. name the KHBV, "The first two prevailing aims for every cost-centre accounting are expressly named for cost-centre accounting in hospitals in KHBV. Thereby it becomes apparent that the emphasis of cost and activity accounting in hospitals lies on the cost-centre accounting."

Approach

For the development of the allocation system for FM services in hospitals, theoretical development work has been combined with information taken out of operational practice and validated through verification of effects considering real hospitals as examples.

Development work was carried out in the framework of the research project "Optimisation and analysis of processes in hospitals" (OPIK), in which the University of Karlsruhe (TH), together with hospitals and FM service providers, performs process analyses and develops benchmarking methods. ([Lennerts et al. 2003], [Lennerts et al. 2004a], [Lennerts et al. 2004b])

Based upon general conditions such as the KHBV, the „Krankenhausfinanzierungsgesetz [KHG, 2003] ' (Hospital financing act) or the GEFMA 200 – Costs in Facility Management [GEFMA 200, 2004] an outline for the allocation of costs was developed. This possible cost structure was confronted with the customer's point of interest and thereby a list of products consisting of services a customer is willing to pay for was generated.

For better assessment of the defined products, an ABC analysis regarding the products and corresponding costs was carried out.

Sample group chosen

For the practical analysis, the hospitals gathered in the OPIK research project were chosen. These are thirteen hospitals that differ in size and focus, but they are all acute care facilities serving the general healthcare provision. Regarding this function the sample group chosen represents a universal set of 1 995 general hospitals in Germany. Taking psychiatric and other preventive care and rehabilitation facilities into consideration, Germany has 3 628 stationary health care facilities [DKG, 2003].

ABC analysis

The ABC analysis is commonly used for prioritising management attention associated with inventory management or assessment of turnover regarding products or customers [Flores and Whybark, 1985]. ABC analysis is a "method for concentration through tripartition: A: important, urgent; B: less important; C: irrelevant, unimportant." [Gabler, 2000]

For investigation of the FM-costs, accounting data of the participating hospitals was transferred into the developed cost structure and allocated to the products. At this point, cost for the single products referring to space has been considered. Thus hospital size has been standardised by using space as the indicator. The costs for all products have been cumulated for all thirteen hospitals. Subsequently the proportion of the overall FM-costs was calculated for each product. The products were then differentiated into only two categories A and B. To this end, products that have the greatest shares of FM-costs and add up to 80% of the total FM-costs have been assigned the A category. All other products were assigned to the B category.

ABC analysis of FM-costs

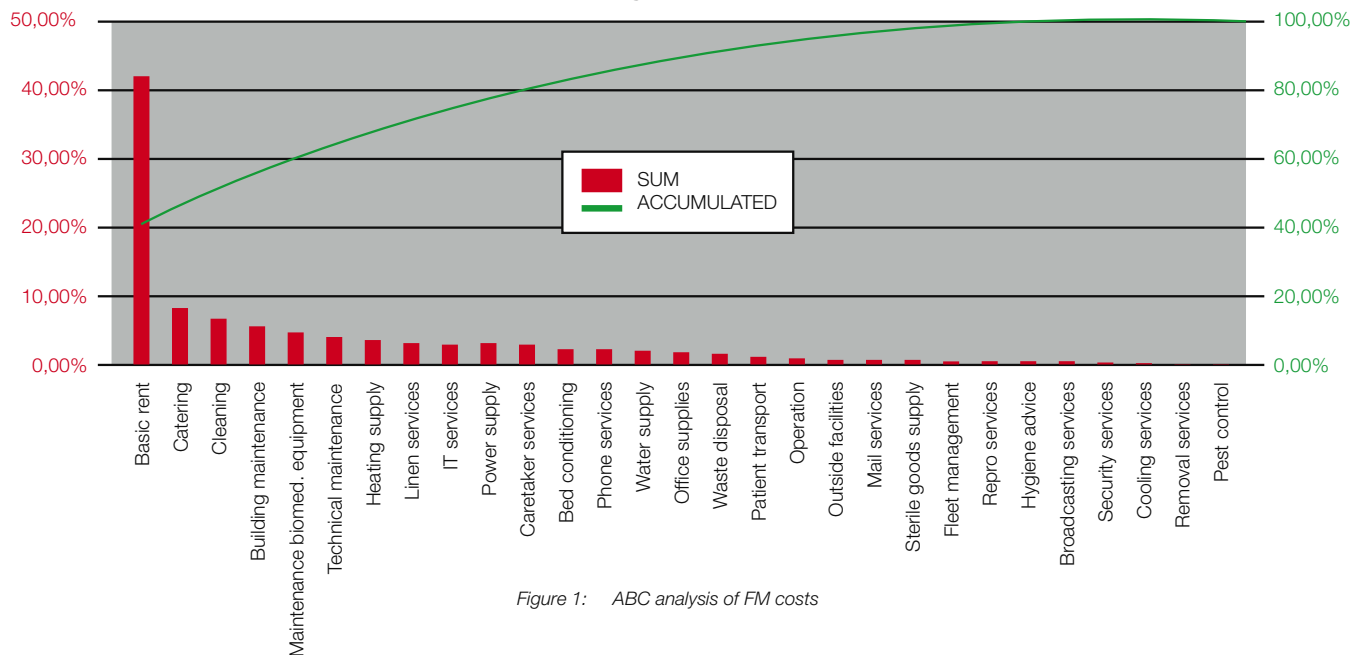


Figure 1: ABC analysis of FM costs

Consideration of existing accounting systems

In order to make the allocation system applicable it has been analysed as to whether and how it can be integrated into existing accounting systems in hospitals. Special emphasis was put on the question whether activity based costing is indispensable or if FM-costs can also be made transparent by means of cost-centre allocation.

Results

ABC-analysis of FM costs

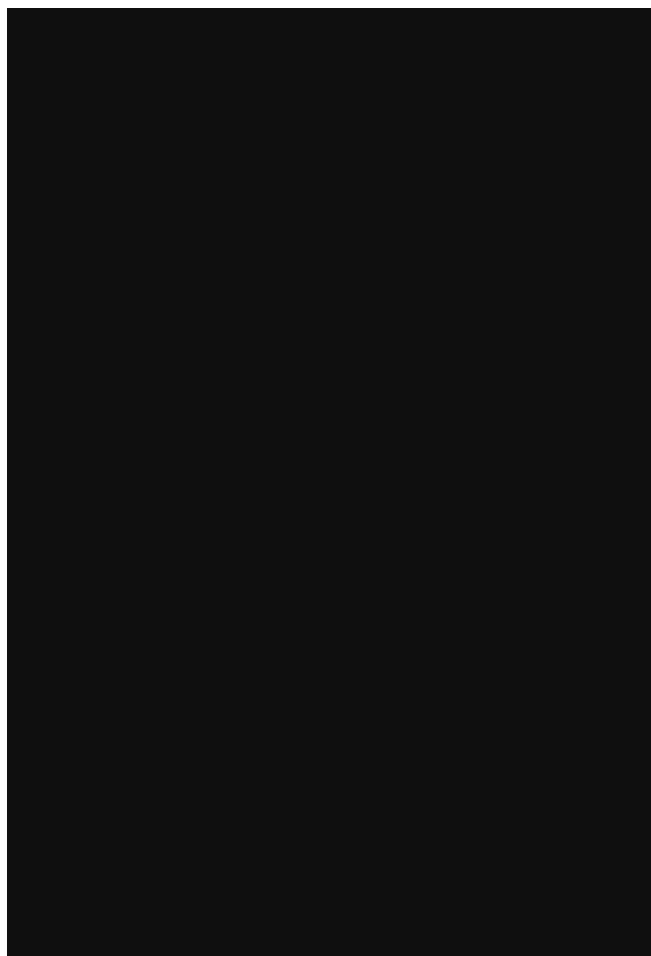
In order to determine the importance of products regarding costs an ABC analysis was carried out. The result is given in Figure 1. The diagram has two scales. The left scale ranging from 0% to 50% is true for the bars in the chart. The bars show the single values of the products. The right scale ranging from 0% to 100% is true for the curve. The curve corresponds to the accumulated single values.

The ABC analysis makes clear that a large part of FM products contributes only marginal cost proportions to the over all FM costs. The biggest share is contributed by the basic rent. This basic rent represents the value corresponding to the availability of space. Almost 41% (40.76%) of the FM-costs can be allocated to the product 'basic rent'. Further big shareholders are the catering (8.62%), cleaning (7.49%) and maintenance (building maintenance 6.33%, maintenance of biomedical equipment 5.07% as well as technical maintenance 4.48%). If heating supply (3.45%) and linen services (3.14%) are also taken into consideration, the threshold of 80% is almost reached (79.35%). Therefore all other products belong to the B category.

The cost allocation system

FM products from the primary processes standpoint

Product as the result of a process [ISO 9000, 2000] and as an instrument of fulfillment of needs [Gabler, 2000] are to be met



in FM mainly in the form of services. Considering the definition of quality [ISO 9000, 2000] it becomes clear that the product is the link between customer and service provider. As the aim of FM is an optimal support of the core process of a business and involved people [GEFMA 100-2, 2004], the requirements are defined by the supported primary processes.

For the assurance of acceptance and comprehensibility of the defined products a set of demands regarding product characteristics was compiled. These are:

- services need to be performed to the benefit of the customer
- comprehensible allocation bases need to be definable
- the effort to acquire the quantities needs to be reasonable
- the product quantity has to be influenced by the customer [Lennerts et al. 2004b]

For the development of the product catalogue, therefore, two principles came to the fore. On the one hand the product needs to be represented by a unit that can be measured in order to allocate costs to it. On the other hand the product is supposed to be a service that is necessary for the performance of core processes. Considering an operating room (OR) as an example the concept is explained.

With reference to FM, for the performance of an operation predominantly space is needed. Because of the high security and hygiene standards, the construction of operating rooms is of high effort and therefore extremely expensive. The provision of this necessary space therefore is the basic service of FM. The installed biomedical equipment needs to be maintained in an absolutely reliable condition. Also the space itself and the installed technical facilities need to be maintained and kept in clean condition. For the personnel, the patient and the operation field, different textiles are needed. During the operation, medical gases as well as conventional media such as electrical power or heating are needed. For the surgeon the appropriate and sterile set of operating tools is needed. All these come under the supreme objective to minimise the danger of infection for the patient. Subsequent to the operation naturally the produced waste and other oddments need to be disposed of.

In the style of thermodynamics the operating room can be regarded as an open system, where different products cross the system border. Corresponding to the mentioned demands regarding product characteristics, the quantity should be easy to measure and it must be possible to provide a monetary value of the product. The model of this perception is shown in Figure 2.

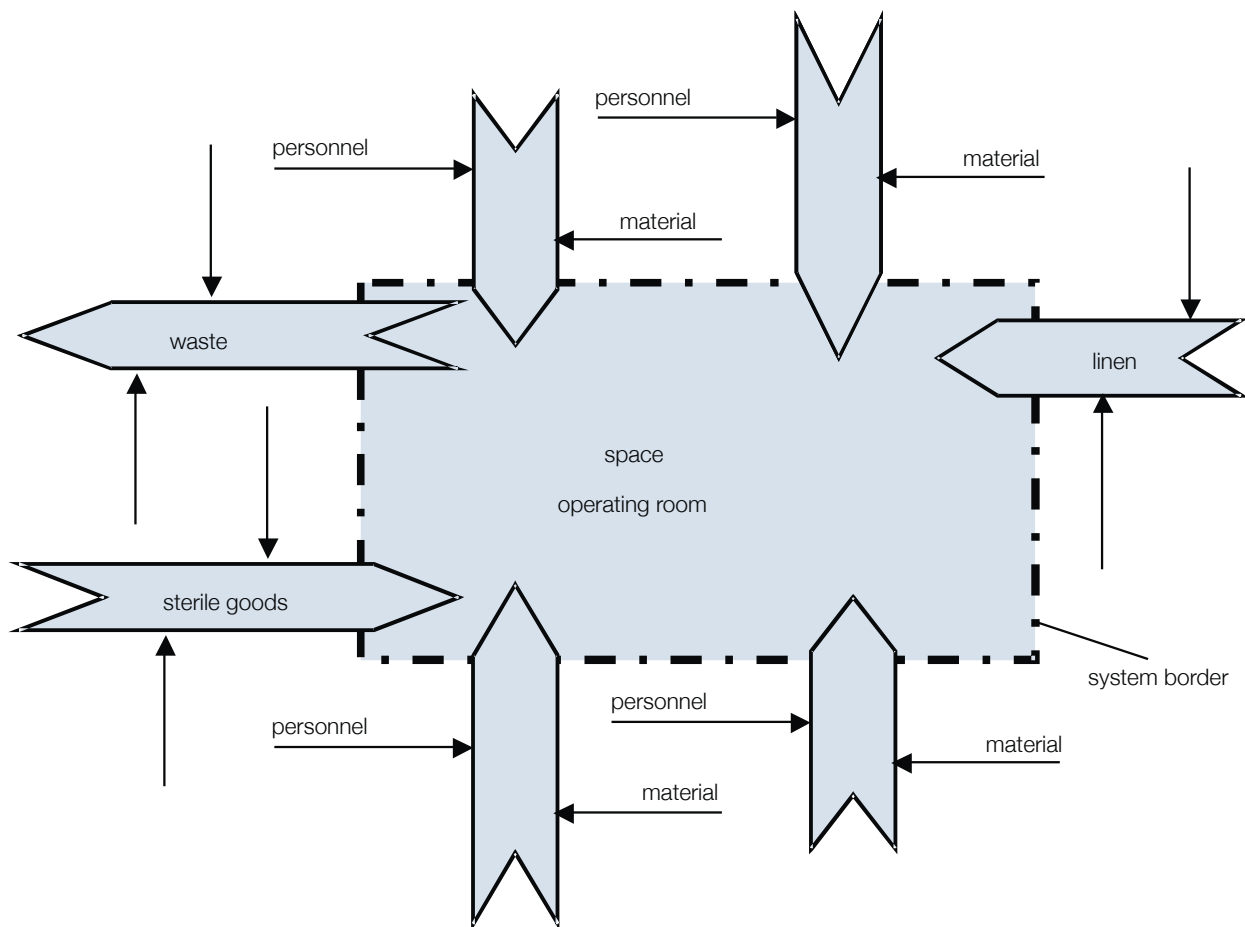


Figure 2: Model of the performance of FM services for an operation

The basis for this new concept is underdeveloped customer-provider relationship in FM for hospitals. A medical unit as recipient of FM services can generally speaking be equated with a field of space, as indicated in Figure 2 FM services. These services are performed by different FM units. Through assignment of FM products to FM cost-centres and the definition of zoned spaces as the service recipient, a simple customer-provider relationship between service recipient on the primary side and service provider on the FM side comes into existence.

The individual FM units can be represented by cost-centres. For the purpose of process oriented cost allocation, the responsibility for certain processes and therefore products needs to be assigned to specific cost-centres (cp. [Braun, 1999]). The cost-centre provides its product for other cost-centres and procures necessary products from other cost-centres for its own production.

Definition of allocation bases

In the field of cost accounting the term cost-driver [Kaplan and Cooper, 1999] or cost-trigger [Müller, 1996] is used. Kaplan and Cooper differentiate their cost-drivers into three categories. They distinguish transaction-, time- and intensity-driver. All drivers have in common that they serve the allocation of activities or services towards higher level processes or cost-centres and finally a product tradable in the market. In order to keep the system in its first draft version clearly arranged and manageable, the differentiation of Kaplan and Cooper was only partly considered. The possibility of the successive introduction of further differentiated cost-drivers was always kept in mind through the development process. The subsequent generated allocation bases are in this case only to be seen as transaction-drivers that refer to the amount of consumed services or products. In contrast to this time-drivers consider a possibly different time spent within the same product and intensity-drivers are capable of reflecting different resource qualities or qualification of the providing personnel.

The definition of the allocation bases sticks to the principle that it has to be possible that all activities can be allocated to a product and that this product has a consumer. The consumer can confirm the receipt of the product or the consumed amount and can be ascertained for the consumer in a transparent manner. The allocation base therefore is a quantitative value that is only used for cost allocation between service provider and recipient. During development of the system qualitative aspects of products have not been considered. Differentiation within products regarding qualitative aspects makes the system and therefore its introduction very complex. An exception was only made for the product space, where the type of utilisation was considered as a quality aspect. An overview of all products and the chosen allocation bases is given in Table 1.

Products	Allocation bases
Bed conditioning	conditioned bed
Broadcasting services	existing TV-sets
Building maintenance	used space according to utilisation
Catering	delivered meal
Cleaning	used space according to utilisation
Cooling service	consumed kWh cooling
Fleet management	used vehicle
Heating supply	consumed kWh heat
Hygiene advice	performed analysis
IT services	supervised PC
Linen services	delivered linen
Maintenance of biomed. equipment	replacement value of biomed. equipment
Operation	used space according to utilisation
Outside facilities	used space according to utilisation
Patient transport	performed patient transport
Pest control	used space according to utilisation
Phone services	utilised phone extension
Power supply	consumed kWh power
Security services	used space according to utilisation
Space provision	used space according to utilisation
Sterilization services	delivered sterile unit
Technical maintenance	used space according to utilisation
Waste disposal	disposed ton waste
Water supply	consumed m ³

Table 1: Products and associated allocation bases

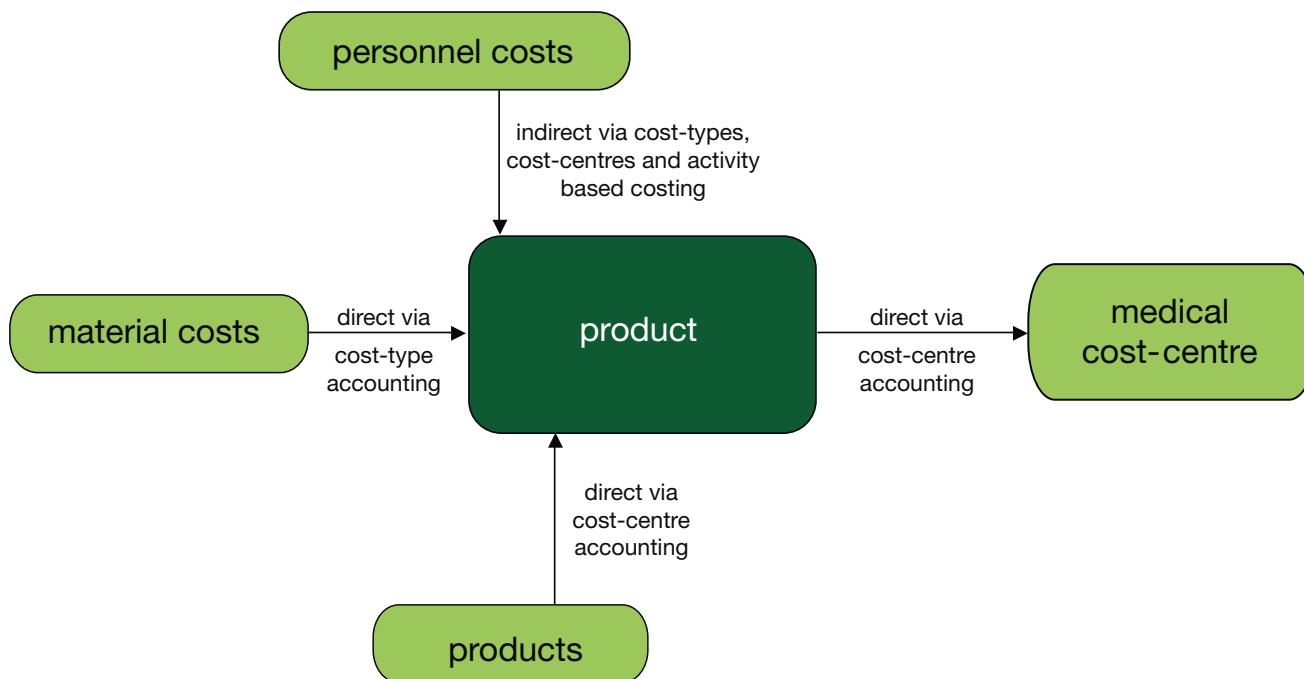


Figure 3: Model of FM service allocation on cost-centres

Model of resource allocation

The problem in the practical application of the developed perception is that it is necessary to combine it with existing cost accounting systems. Three problems need to be faced in this case (see Figure 3):

1. the material costs arising in connection with FM need to be allocated to products
2. the personnel costs need to be allocated to the products
3. the allocation bases need to be ascertained and allocated to the responsible consuming unit

After analysis of the existing cost-structures of the participating hospitals and under consideration of the legal basis it was possible to develop a structure that ensures a direct link between costs and FM products. Therefore the allocation effort can be minimised on the material costs side.

The allocation of personnel costs to FM products is much more complicated in German hospitals. As the legal basis does not facilitate a simple product oriented allocation through cost-types and one cost-centre can be involved in several products, and need to be acquired separately. Although a proportional estimation of the shares is possible, it is advisable to introduce parts of the activity based costing in order to enable a precise cost allocation.

The final allocation of products on the service recipient is carried out using the defined allocation bases. This is

a matter of internal allocation based upon simple cost-centre accounting. The theoretical model assumes that all FM services are allocated to medical cost-centres using the corresponding allocation basis. Practice, however, has shown that the successive introduction using the ABC analysis as a guideline makes sense and is possible and even in the long run a consideration of all possible products might be not reasonable because of an unfavourable cost-value ratio regarding quantity ascertainment.

Conclusions

Through the developed allocation system it is possible not only to describe the value of FM services on a qualitative basis but to quantify it precisely. The quantification creates transparency that supports the conscious use of FM products and services and therefore sustainably conserves the resources. The system can be introduced with little effort in the first step and successively expanded according to specific needs. Nevertheless data about space and by whom it is used has to be available or needs to be raised. In general it has to be admitted that controlling procedures get more complex through the introduction of the proposed system. Although the effort for data entry has been minimised or is on the same level that most hospitals currently pursue, the effort for maintaining the controlling system increases through the introduction of the system.

A major advantage of the system is the clarification of FM services. The negotiating position facing business administration units is improved because language and database are subject to fewer differences. In general the facility manager's standing is highly improved.

The proposed system can – with a few modifications – be easily adopted in branches other than hospitals. The system should be beneficial especially within the service industry where, besides personnel cost, workplace provision costs play a decisive role.

Finally, the developed system can also be used as the basis for statistical surveys and is therefore capable of describing comparable prices for FM services in hospitals. Based upon this statistical data, a prognosis or simulation of FM costs should be within the realm of possibility. In this context, an interesting analysis would be whether and how the amount of consumed FM services corresponds to the size of a hospital.

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