Benchmarking the cleaning and textile service of top-clinical hospitals

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UNIVERSITY OF TWENTE.

MST Medisch Spectrum Twente
een santeon ziekenhuis

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Preface

The report in front of you is to conclude my master's degree Business Administration at the University of Twente. It is about the benchmarking of the cleaning and textile services of top-clinical hospitals.

I would like to thank my supervisors, Istvan and Marcel, and my colleagues at MST for their support. For their input on the subject matter and sometimes delivering distraction (with cookies for example). I also want to thank all interviewees at the different hospitals for their cooperation and input. Also, I like to thank my supervisor at the UT, Henry, for his time and feedback. In the beginning, it was hard to get the study on track, but it has delivered a good result and the other supervisor Siraz for the final review. And I would like to express my gratitude to my family and friends for their support during good times and during setbacks.

Silvo Jeunink

Management summary

The spending on health care services in the Netherlands has shown a steady growth. The spending per capita roughly doubled from €2,600 in 2000 to €5,000 in 2012. Because of the growth in expenditure, social and political pressure has increased to keep the cost of health care in control. These developments have put pressure on the budgets of MST and in turn on those of RC contract management. RC contract management is responsible for the management of soft facility services at MST. The realised cost of RC contract management has exceeded the budget in the past years. This brings up the discussion about the size of the budget and the efficiency of the soft facility services. A solution is sought which provides knowledge about the efficiency of the current situation. The services of cleaning and textile are in scope, because they have the largest share in the budget and budget deviations.

A possible solution is sought in strategic management accounting (SMA). The techniques present in SMA literature were analysed on the following criteria:

- Provides a measure/standard for the efficiency
- Focuses on performance relevant to the services in regard
- Suits the hospital, non-directly competitive environment, where a continuous service is delivered to the organisation
- Potentially indicates where improvements could be made

Three solutions were found to be potential candidates: balanced scorecard, benchmarking and competitor cost assessment. Benchmarking was found to be most suitable.

One of the most common definitions of benchmarking. "*Benchmarking is the search for the best industry practices which will lead to exceptional performance through the implementation of these best practices*" (Camp, 1989). It is a manner to find organization's activities which could be more efficient or effective by comparison with other relevant organisations. Benchmarking types differ in nature, content and purpose. The benchmarking should compare hospitals in a collaborative environment and is therefore external and collaborative.

A step-by-step plan is proposed for the benchmarking process, consisting of the following steps. Steps one until four are within the scope of this study.

1. Receive fiat for benchmarking and form a benchmarking team
2. Identify the benchmarking subject
3. Identify benchmarking partners
4. Identify the benchmarking criteria
5. Perform the benchmarking study
6. Measure the gap between partners and establish goals for action plans
7. Develop action plans
8. Implement the action plans and monitor progress
9. Recalibrate the benchmark

The fiat was received and the benchmarking team consists of the thesis writer and two employees of RC contract management. The subjects are the services of cleaning and textile.

The benchmarking partners are found within Santeon, a collaboration of top-clinical hospitals. Five of the seven members agreed to cooperate in the benchmarking study. In consultation with benchmarking partners, the benchmarking indicators were formulated.

In the following, a short description is provided about the benchmark of the cleaning and textile service. See Appendix I, for the benchmark overview.

For cleaning, the main goal is to keep the rooms inside the hospital clean in accordance with the requirements. Hygiene is the most important aspect of cleaning. All hospitals have requirements to guarantee sufficient hygiene on their departments. Therefore, the hygiene between similar departments of different hospitals is assumed to be the same. The quality of experience is also considered important by benchmarking partners. The requirements for cleaning differ per department in the hospital. Therefore, the hospital is divided into four departments with similar cleaning requirements. The departments identified are: policlinic outpatients' department, nursing ward, hot floor and other. The cleaning activities at the departments are subdivided into regular and variable work. The regular work (*bestek*) is about the cleaning activities, which take place on a regular schedule. The cleaning activities of the variable work differ per department. On the nursing ward it consists of the cleaning activities at discharge or transfer. On the hot floor it consists of the cleaning activities between operations. The most important factor to average cost between hospitals is square meter for the regular work. For variable work, it relates to the cause of the work. Differences between partners are present in the work program and tasks of cleaning. The work program is influenced by, for example, the finishing of the rooms. A difference in tasks, for example, is that the cleaning includes the responsibility to fill the wardrobes of the patient rooms with linen.
The textile service is regarded as two separate services, the first of service clothing and the second of linen. For service clothing, the main goal is to provide clean service clothing of the right kind and size to the authorised employees. An important aspect is the availability of service clothing. The most important factor to average cost between hospitals is active wearers. For linen, the main goal is to provide right and clean linen to the departments of the hospital. The cost is mostly related to the consumption of linen at the nursing ward departments. There is a large variation in consumption between the different nursing ward departments. Therefore, the benchmark does not only consider the high level, but also a typical nursing ward department and manner of bed making. A large share of the consumption of linen is related to bed making.

The groundwork for benchmarking of the two services has been laid. The main recommendation is to fully execute the benchmarking process. The informational value of quality of experience of cleaning comparison may have limited value, because of difference in concept and measurement between benchmarking partners. An investigation into the differences could enhance the benchmarking. During the research, it was found that there are differences in patient-related services at the different hospitals. An investigation about the benefits and downsides of the different structures, could be of value.

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1 Introduction

To graduate from the master Business Administration, a research is conducted at the responsibility centre (RC) (*resultaatverantwoordelijke eenheid*) contract management of Medisch Spectrum Twente (MST). In this chapter, MST and RC contract management are introduced, the problem statement is discussed and the research objective and question are clarified.

1.1 Medisch Spectrum Twente

MST is the local hospital of Enschede. Its headquarters are in Enschede and branches are present in Oldenzaal and Haaksbergen. It provides health care in a service area consisting of around 250,000 persons, has around 2,800 employees and around 600 beds[1]. Almost all medical specialties are represented in the hospital. The hospital is divided into medical departments, which deliver health care of a specific medical speciality. Each specialty is its own RC as part of the management control system of the organisation. The services delivered by Dutch hospitals are called diagnosis-treatment combinations (DTC) (*diagnose-behandelcombinaties*), which consist of services directly and indirectly related to the diagnosing and treatment of a disease or injury. Direct services at the hospital include the diagnosis, operation and drugs prescribed by the doctor, i.e. the work delivered by a medical department to heal a patient. Indirect services have a supportive function, which are at MST the staff services Quality & Safety (Kwaliteit & Veiligheid), Human Resource Management, Finance & Accounting/Purchasing (*Financien & Informatiezaken/Inkoop*), Marketing, Communication & Sales (*Marketing, Communicatie & Sales*) and other services like 'IC MT' which is responsible for the IT and medical systems in the hospital, Hospitality & Logistics (*Hospitality & Logistiek*) which is responsible for a part of the facility services and Real estate & Housing (*Vastgoed & Huisvesting*) which is responsible for the other part of the facility services. The staff and supportive services are regarded as service cost centres, which cause the indirect cost/overhead.

1.1.1 RC contract management

The research has been conducted at the RC contract management, which is part of the service Hospitality & Logistics, one of the supportive services of MST with an emphasis on facility management. Facility management is defined by Nelson and Alexander (2002) as "the management of non-core company assets to support and increase the efficiency of the main business of the organisation". A further distinction can be made into hard and soft facility services. Hard services are the heating, lighting and building maintenance, which are related to the physical fabric of the building. Soft services make the environment more pleasant, examples of these services are cleaning, catering and waste management. Soft facility services are delivered by the service Hospitality & Logistics and therefore also by the RC contract management.

1.1.2 Revenue and cost

To clarify the financial structure of the hospital and the RC contract management, in this section a financial introduction is given.

[1] Medical specialist are excluded from the employee number, source: https://www.santeon.nl/ziekenhuis/mst/

1.1.2.1 Revenue

The hospital generates a revenue for its delivered services. The operating income from 2012 to 2016 is shown in Table 1. The largest share of the revenue is received for the delivered DTCs, shown as percentages in the table. The operating income from 2012 to 2015 has shown a yearly increase and decreased only in 2016. If only the revenue from DTCs was regarded, the income would have shown an increase in all five years.

	2012	2013	2014	2015	2016
Operating income	€344,536 (91%)	€361,462 (92%)	€364,088 (92%)	€432,461 (89%)	€418,646 (92%)

Table 1: Operating income and revenue for the delivered DTCs of MST in 2012-2016 (x€1000)

1.1.2.2 Cost

At the cost side, MST has had the operating expenses and budget deviation of Table 2. The budget deviation is shown as a percentage. A positive percentage means that the cost was within the budget, and a negative percentage means the cost has exceeded the budget. The table shows that in the last years five years the realised costs exceeded the prescribed budget, especially in the year 2015. Since 2013 hospitals in the Netherlands are required to work competitively, therefore, there is more pressure on the budget, because of lower (expected) revenue from DTCs. A cost savings program was called into place at 2016, which also included a reorganisation. At the year 2015, cost allocations were made for the reorganisation, which explains the higher budget deviation in comparison with the other years. The program should be implemented by 2018 to heal the financial situation of the hospital.

The cost and cost structure are reviewed on a ledger level, because the scope is on RC contract management, only ledger lines related are set out. In Table 5, the cost structure of MST at ledger level is shown. At level 2 only the 'further operating expenses' are expanded to show level 3.

In Table 2, the realisation and budget of the 'further operating expenses' are presented. In the five years shown, the cost was higher than the budget, which explains for a large part the budget deviations. Around two-thirds of the 'further operating expenses' are incurred by 'patient-related costs' which can be directly related to providing a DTC to a patient. For examples of these costs see Table 5.

For the RC contract management, an important ledger line is the 'nutrition and hotel-like costs'. In Table 2, the details of this ledger line are shown. The costs incurred at the RC contract management are for more than ninety percent part of 'nutrition and hotel-like costs' of level 3. The table shows that for this five years the budget deviation was negative. Because of the extended focus on cost savings, it is important to all RCs contributing to this ledger line to decrease their costs.

	2012	2013	2014	2015	2016
Operating expenses	€307,073 (-5%)	€314,723 (-4%)	€326,053 (-5%)	€398,045 (-11%)	€388,229 (-1%)
Further operating expenses	€133,008 (-6%)	€137,917 (-5%)	€139,412 (-8%)	€155,983 (-22%)	€148,544 (-4%)
Nutrition and hotel-like costs	€8,777 (-1%)	€9,203 (-8%)	€9,536 (-10%)	€9,354 (-5%)	€10,879 (-9%)

Table 2: Expenses and costs of MST in 2012-2016 (x€1000)

To provide information on the share of RC contract management, its share of the total of the ledger lines is presented in Table 3. From the table can be concluded that the RC has the largest contribution to the ledger line 'nutrition and hotel-like costs'. The share has increased over time, because of the introduction of patient-oriented meals. In 2016 there was an increased share, due to the new building. Therefore, the RC has a high influence on the cost management.

	2012	2013	2014	2015	2016
Operation expense	2.5%	2.6%	2.9%	2.4%	4.4%
Further operating expenses	4.2%	4.4%	5.2%	4.7%	6.1%
Nutrition and hotel-like costs	72%	73%	75%	76%	82%

Table 3: Share of RC contract management to ledger lines, compensated for pass-on costs, in 2012 - 2016

The three services of facility management with the highest costs inside RC contract management are cleaning, textile and patient nutrition. Other services are waste management, entertainment systems for patients and banqueting. In the next part, the content, cost, and budget of three main services are discussed.

The cleaning service cleans all the rooms and general areas of the hospital on a regular schedule. After each check-out of a patient, the patient room is also cleaned. The budget for this service has gradually increased from around 3 million euro to more than 4 million euro in 2016. Table 4 shows in most years the realisation costs exceeded the budget. The last two years the realisation was higher because of the relocation to the new building of the hospital, but probably was also in excess without these one-off costs. This service is outsourced and therefore the employees are not on the payroll of the hospital, so almost no personnel costs are in the ledger. In the cost accounting scheme, the budget is for 98% built-up by 'nutrition and hotel-like costs'.

The textile service provides clean textile to employees and patients. For employees these are the uniforms, for patients these are, among others, beddings, sheets, and heat coats. The costs incurred are rent and cleaning cost for the textile. Because this service is outsourced its costs are regarded as 'nutrition and hotel-like costs'. The realisation has steadily grown since 2012, but drops in 2015 as shown in Table 4. This is to encourage further cost reductions by extending pressure on the budget.

The patient nutrition service is about the meals provided by the hospital for its inhabitants. These services are now outsourced, but not before 2016. Therefore, before 2016 only 40 to 50% of this service were 'nutrition and hotel-like costs'. In the last five years, the spending was on budget (see Table 4), except for 2016. The figure of 2016 distorts the actual costs of this service, because another service of department assistant (*roomservice*) was added to the same cost centre. The biggest cost incurred for department assistant service was 'personnel cost', which does not have a share in 'nutrition and hotel-like costs', but increases the total 'operating expense'. In total in 2015 more than 8.8 million euro was spent on the three services. The cleaning had the largest share in the budget and the largest budget deviations over the years in comparison. Therefore, it could be the service, where the most profit can be gained.

	2012	2013	2014	2015	2016
Cleaning	€3,016 (1%)	€3,501 (-6%)	€3,787 (-5%)	€4,226 (-16%)	€4,976 (-19%)
Textile	€1,712 (-6%)	€1,841 (-5%)	€1,938 (1%)	€1,729 (9%)	€1,778 (1%)
Patient nutrition	€2,632 (1%)	€2,579 (3%)	€3,000 (5%)	€2,864 (7%)	€9,032 (-28%)
Total	€7,360 (-1%)	€7,922 (-3%)	€8,725 (0%)	€8,820 (-2%)	€15,786 (-21%)

Table 4: Cost of cleaning, textile and patient nutrition in 2012 – 2016 (x€1000)

Ledger level			Description	Example(s)
1	**2[2]**	**3[3]**		
Operating income (*Bedrijfsopbrengsten*)			Total revenue created	Received payments from health insurers for DTCs
Operation expenses (*Bedrijfslasten*)	Personnel cost (*Personeelskosten*)		Total spending on personnel	Salaries for doctors, nurses, etc
	Further operating expenses (*Overige bedrijfskosten*)	Nutrition and hotel-like costs (*Voedingsmiddelen en hotelmatige kosten*)	All costs related to nutrition and hotel-like costs	Including cleaning, meals, disposables, washing costs and patient transport
		Overheads (*Algemene kosten*)	General costs	Including office supplies, (special) software licences, administration costs, and PR.
		Patient-related costs (*Patientgebonden kosten*)	Costs which can be related to a patient (direct)	Including equipment needed for treatment, like prosthesis, neurostimulators, needles, purchase, and maintenance of medical equipment and medicines.
		Maintenance and energy cost (*Onderhoud en energiekosten*)	Cost for the maintenance and heating of the building	Including roofbed, gutters and sewage, Preventive maintenance and energy, gas and water
		Rent and leasing (*Huur en leasing*)	Rent and leasing of buildings, installations or cars	Rent paid for some buildings, cars and equipment
		Allocations provision (*Dotaties voorzieningen*)	Allocations made for special provisions	Extra costs incurred by the reorganisation
		Miscellaneous costs (*Diverse kosten*)	Other cost not related to any previously mentioned.	(not specified)
Depreciation and amortization (*Afschrijvingen*)			Total depreciation and amortization cost	Depreciation on buildings, machines and other inventory.
Financial result/result participation (*Financiele lasten/resultaat deelnemeningen*)			Total interest payments on debts and income received by holdings.	Including interest payments on long-term and short-term loans

Table 5: Explanation structure of income statement of ledger

[2] Only entries shown which are part of operation expenses of ledger level 1.
[3] Only entries shown which are part of further operation expenses of ledger level 2.

1.2 Problem statement

The spending on health care services in the Netherlands has shown a steady growth. The spending per capita roughly doubled from €2,600 in 2000 to €5,000 in 2012 (RIVM, 2013), which is an increase of 5.6% every year. There are a few reasons for this growth. A first reason is the aging of the population. The number of elderly is increasing and their life expectancy has risen. A second reason is more prosperity of the population, because health is regarded as important, more is spent on health care. A third reason is the smaller growth in comparison with other sectors, of the labour productivity. Because of the growth of expenditure, social and political pressure has increased to keep the cost of health care in control (Ministerie van Volksgezondheid, 2012). Therefore, it is since 2013 for hospitals in the Netherlands required to work competitively. In this new environment, the health insurers also have the liberty to contract a hospital or not. An extensive cost savings program is in place since 2016 at the whole MST with the motto 'Expensive when needed and inexpensive when possible'. Considering these developments, all RCs should continuously improve their processes and be more efficient. Every year the budget of the facility management's RC contract management is determined, which is based on historical information and developments. The goal of the cost savings program is to reduce the budget every year in comparison with the turnover of the hospital, especially of those services regarded as overhead. The goal is to provide the facility services as efficient as possible. In the years 2012 to 2016, the realised costs have exceeded the budget of 'nutrition and hotel-like costs' with one to ten percent. The size of the cost-budget at least required, in relation to the income generated, to provide the soft facility services has been brought up for discussion between the RC's management and the general management. There is no measure now at RC contract management to assess whether the efficiency of the services is sufficient (or as efficient as theoretical possible), which retains the discussion about the efficiency of the facility services. Systems present at MST are focused on quality control or provide a cost-benchmark. The cost-benchmark compares the cost and overhead structure of the DTCs delivered by the hospital to other external hospitals. Differences between the hospitals are shown by this benchmark, but it is not clear how to interpret these differences. The problem is the lack of information about the current efficiency of the soft facility services. A solution should provide a measure of the efficiency of the current situation is. In the future, the solution may be extended or adapted to indicate where potential improvements can be made. The focus is on the cleaning, textile and patient nutrition of the soft facility services as these have the highest economic share to the RC regarded.

1.3 Research objective

Management accounting is defined by the American Accounting Organisation as: "The process of identifying, measuring and communicating economic information to permit informed judgment and decisions by users of the information" (Drury, 2012). The problem described is in the domain of management accounting. The research objective is to pose a solution for the problem present at the RC contract management of MST.

1.4 Research question

As a result, the following research question is formulated.
How to apply a technique or method in the domain of management accounting to solve the problem present at RC contract management of MST?

1.5 Report structure

In chapter 2, strategic management accounting topics are discussed to offer a solution to the problem. In the following chapter, chapter 3, benchmarking is introduced and its literature is discussed. In chapter 4, the benchmarking step-by-step plan is proposed. In chapter 5, the step-by-step plan is implemented. In the final chapter, chapter 6, the conclusions and recommendations are presented.

2 Strategic management accounting

In this chapter, strategic management accounting (SMA) is treated. A possible solution may be found in SMA.

The use of the more advanced SMA meets the need for continuous improvement and allows the use of external information into management accounting. A (financial or non-financial) tooling implemented should provide information, which is not only based on historical figures. The problem is about one of the departments inside a larger organisation, not delivering a direct service to consumers, but providing a continuous service of a minimum quality to the own organisation. There is no direct competition with other departments or organisations.

Traditional management accounting practices have the focus on internal measures which are financially-oriented, like cost variance analysis and profit-based measures. The management accounting techniques, that are more contemporary, consider financial and non-financial information to achieve continuous improvement and can include external information about competitors (Chenhall & Langfield-Smith, 1998a; Drury, 2012). SMA is defined as the way forward, however, there is no agreement about the definition and the framework on what constitutes management accounting (Drury, 2012; Langfield-Smith, 2008; Roslender & Hart, 2003). Simmonds (1981) states that SMA would assist strategic decision making. Lord (1996) identifies a few viewpoints about the focus of the extension. The first viewpoint is to include the use of external information about competitors, as an extension of the internal focus of traditional management accounting. The second viewpoint is about the strategic positioning and its relation to management accounting, i.e. accounting in relation to strategic positioning. The third viewpoint is about manners to reduce cost and/or enhance differentiation of a firm's products by using the linkages in the value chain and optimising cost drivers and thereby gaining a competitive advantage. The fourth viewpoint challenges the previous ones. It questions the ability of managers to purposely plan a strategy. Guilding, Cravens, and Tayles (2000) regard SMA as inclusive for techniques that are environmental (outward-looking) and/or future-orientated (forward-looking). Little research has been done about the usage and constituents of SMA practices in companies. Chenhall and Langfield-Smith (1998b) undertook a survey which was focused on management accounting practices including SMA practices. Guilding et al. (2000) identifies twelve SMA techniques and undertook, as one of the few authors, surveys about the usage. Roslender and Hart (2003) also introduce and discuss some SMA techniques. Another source of SMA techniques is the book of Drury (2012). Cadez and Guilding (2008) have identified sixteen SMA techniques, extending the selection of Guilding et al. (2000). The found SMA techniques are categorised (with some alterations) based on the paper of Cadez and Guilding (2008) into five categories: planning, control and performance measurement, competitor accounting, costing, strategic decision making, customer accounting and miscellaneous. A technique could be a solution if it meets the following criteria:

- Provides a measure/standard for the efficiency
- Focuses on performance relevant to the three services in regard
- Suits the hospital, non-directly competitive environment, where a continuous service is delivered to the organisation
- Potentially indicates where improvements could be made

The first two categories are regarded more comprehensively, because the techniques in these categories have a larger potential to be in accordance with the criteria.

2.1 Planning, control and performance measurement

The following techniques should provide an improvement on planning, control and performance measurement.

2.1.1 Balanced scorecard

It has the purpose to encourage behaviour which is aligned with the organisation's strategy. It consists of an integrated framework with the purpose to clarify, communicate and manage strategy implementation. The balanced scorecard integrates both financial and non-financial measures and incorporates performance measures within the strategic management process. The balanced scorecard emphasises four perspectives: financial, customer, internal business and learning and growth perspective. The organisation's vision and strategy are translated into operational objectives and linked to performance measures for the four perspectives. The technique is a manner to streamline the continuous improvement. Because of its clearly defined targets, it can support this process (Drury, 2012). Not all the perspectives on the performance of the balanced scorecard are relevant. However, it can tell how efficient the services are and point to possible improvements. The balanced scorecard can be implemented in a competitive or non-competitive environment. Because of these reasons, the technique could be an option.

2.1.2 Benchmarking

It is about identifying the best manner of performing activities and business processes. This is done by comparing key activities at (large) organisations internally or externally at non-rival organisations. Benchmarking is one of the tools which are in use in SMA. The goal of a benchmark is to find and implement best practices (Camp, 1992). It considers financial and non-financial information by doing an external performance measure, which is only possible when a benchmarking club can be formed. Benchmarking can only be used externally, if a non-rival comparable organisation can be found. MST is part of the Santeon collaboration, which is a collaboration of seven top-clinical hospitals spread across the Netherlands. Members for a benchmarking club can be found within this collaboration. The quality of a benchmark depends on its indicators, which can be shaped. The comparing nature of benchmarking could provide a measure of the current efficiency. The focus of the benchmarking is determined by the benchmarking parties and it can be applied in a non-competitive environment. Because of its focus on finding best practices, it can potentially be used for performance improvement.

2.2 Competitor accounting

At the following techniques, external information about the competitor is included in the management accounting (Guilding, 1999). The competitor accounting techniques could be used in combination to enhance the information value of the tool.

2.2.1 Competitor cost assessment

It estimates on regular intervals of the competitor’s cost, based on, e.g. appraisal of facilities, technology and economies of scale or from indirect sources such as physical observation,

mutual suppliers or customers and employees. The results of the comparison based on competitor's cost may have an influence on the pricing strategy. For example, a case of a cost disadvantage in comparison with the competitors could be recognised at an early stage. As a consequence, a well-directed cost reduction program could be implemented to prevent ruinous competition. Competitor cost assessment is limited by the cost to acquire data and potential obstacles, which sometimes cannot be overcome. Competitors are in general not willing to share information about their cost structure and information is normally drawn from public sources. Since MST is part of the Santeon collaboration, information could be obtained via the collaboration. The technique can assess the current cost-efficiency, but is not related to other aspects of performance. It is developed for a competitive environment (Heinen & Hoffjan, 2005). This technique could be an option.

2.2.2 Competitive position monitoring

The analysis of competitor positions within the industry by following trends in sales, market share, volume, unit cost and return on sales. It is regarded as an extension on the insight provided by competitor cost assessment. Because of its separate nature of data collection, which is more in line with traditional accounting, it is regarded as a separate SMA technique. Its indicators are chosen to provide information about the current competitive position (Simmonds, 1986). The RC contract management is not in a direct competitive position with similar departments at external hospitals. The analysis does therefore not provide the desired information.

2.2.3 Competitor appraisal based on published financial statements

An approach to competitor performance appraisal, which is based on the published financial statements. However, only information from published financial statements will likely be brief and not conducive. In the situation of the case, it would be about a similar department at another hospital (Moon & Bates, 1993). Therefore, this technique is not suitable for the case.

2.3 Costing

The focus is on cost reduction, continuous improvement and change at the following techniques (Drury, 2012; Guilding et al., 2000).

2.3.1 Attribute costing

It has the notion to view product attributes which appeal to customers as cost objects. Examples of products attributes are operating performance variables, agreements on reliability and warranty, degree of finishing as well as service factors like supply assurances and service after sales. The technique is not in accordance with the criteria. It is meant for an organisation delivering a product or service to a consumer. In the case, the service and quality are determined by standards set by the organisation.

2.3.2 Kaizen costing

Following Guilding et al. (2000) closely associated with target costing. Kaizen is a mechanism to optimise the (production) process by small incremental steps, rather than through large innovations. The major difference between target and kaizen costing is that target costing is normally applied during the design stage and kaizen costing during the manufacturing stage

of the product lifecycle. The goal of kaizen costing is not to provide information on the current way of performing, therefore it does not meet the criteria.

2.3.3 Life cycle costing

Cost appraisal is done on the basis on the length of the stages in a product's life instead of an annual basis. These stages can include design, introduction, growth, maturity and decline. Advocates of this technique say that it can counter the short-termism tendencies of the management. The services and products delivered by the RC contract management do not have a long-time span or a time-span at all. This technique does not suit the case.

2.3.4 Quality costing

It aims to provide information related to the quality of products and services and activities that produce them. Because customers nowadays demand products which have ever-improving levels of service regarding cost, quality, reliability and innovativeness, quality can be a source of competitive advantage. The aim of this technique is to provide management accounting information related to the quality of the product and services and activities to produce them. The services and products of RC contract management are not (to this degree) consumer-driven and the cost of quality is not the main cost driver.

2.3.5 Target costing

It refers to the process where a product is designed to satisfy customer needs and a target cost is determined for the product. The product is then designed to meet that cost, the targets here are set during the design stage in contrast to Kaizen costing. The first question of analysis at target costing, is the target price customers are willing to pay for a product. In the hospital environment, a certain minimum quality of facility services is required. It is irrelevant, whether this may or may not correspond to the perceived value of the customer, i.e. the price the consumer is willing to pay. Therefore, target costing does not meet the criteria.

2.3.6 Value chain costing

For this technique, the series of activities occurring between the product's design and its distribution are regarded as links in a chain. Value chain costing concerns itself with identifying where customer value can be increased or cost lowered in segments relevant to the firm. The technique is more focused on a product developing/manufacturing organisation. The technique does not provide information on the current efficiency.

2.4 Strategic decision making

The techniques in this section are related to strategic positioning and its relation to management accounting with the goal to support the decision-making process (Guilding et al., 2000).

2.4.1 Brand valuation

The assessment of brand value through the assessment of brand strength factors. In a management accounting perspective, it has the potential to measure marketing achievements in strongly branded companies. The RC contract management is not a strongly branded company or pursuing marketing achievements. This technique does not solve the problem posed.

2.4.2 Strategic pricing

Instead of taking historically-based, internally oriented information to determine the price of a product. Strategic pricing analyses the pricing of a product in a competitively orientated manner, which could result in a better-informed pricing decision. Factors which can be included in this analysis are: competitor price reaction, price elasticity, projected market growth and economies of scale. The technique does not meet the criteria.

2.5 Customer accounting

The following techniques emphasise the value or profit created by a customer to the organisation.

2.5.1 Customer profitability analysis

Customer profitability is the total profit made by an organisation due to an individual customer. The analysis can be a basis for marketing based decisions. For example, marketing efforts are best focused on the most profitable customers. Patients of the hospital could be regarded as the customers of RC contract management, nevertheless persons do not choose to be a patient of a hospital. Therefore, this technique does not suit to the case. (Mulhern, 1999).

2.5.2 Lifetime customer profitability analysis

For this technique the customer profitability analysis emphasises the whole 'lifetime' of the customer. The customer profitability analysis is, for example, extended with a customer retention model. This technique does not suit the case (Dwyer, 1997).

2.5.3 Valuation of customers as assets

For this technique, a customer is regarded as an asset to the organisation. By providing a link between customer and firm value, a value can be given to the asset 'customer'. In this way, it can provide an alternative way to assess the firm value and provide guidelines for strategic decisions such as mergers and acquisitions. On a higher level in the organisation, it may provide information about the valuation. The technique does not meet the criteria (Gupta & Lehmann, 2003).

2.6 Miscellaneous

The techniques in this section did not correspond to the other categories (Drury, 2012).

2.6.1 Activity-based management (ABM)

An activity-based costing (ABC) accounting scheme provides a more accurate product costing information. The term activity-based management describes the management accounting applications of ABC. ABC provides insight into the cost of the activities during the process by assigning the overhead more accurately to the delivered products (in the hospital environment, the DTCs). By analysing these activities on their value-added, cost savings can be made. For example, a non-value-added activity provides an opportunity to reduce cost without reducing the perceived value to the customer. To successfully implement activity-based management it is required to implement an activity-based accounting scheme. This

focusses on managing the business based on the activities undertaken by the organisation. As activities are assumed to consume costs. The downside is that a new accounting scheme with more complexity is required to be implemented. This will provide further insight on the product level (about the overhead), but will not be especially helpful for the RC contract management. Since most of the services and products delivered are continuous and not always related to the delivered DTCs. Therefore, this technique is not recommended for the case.

2.6.2 Business process re-engineering

It is about examining the business process and changing the way the organization currently operates, with the aim to optimise the process. The characteristic of this technique is a radical change in the process by abandoning the current practices and reinventing completely new ones. For instance, introducing a just-in-time (JIT) system into the organisation. The alteration of the current way of performing activities can further enhance the efficiency. The method, however, does not demonstrate what the level of the current efficiency is. Applying this technique would require research into the manners of business process re-engineering and what the expected improvement of the alteration would be. Therefore, the method is complex and does not guarantee improvements on its own.

2.6.3 Just-in-time (JIT)

JIT is a different way of operating a business. The aim of JIT manufacturing is to reduce waste by producing the required items, at the required quality and quantity, at the exact time when they are required. JIT focused management accounting systems should reflect this way of operating. The technique does not meet the criteria.

2.7 Proposed solution

All in all, many of the SMA techniques are not in accordance with the criteria. A suitable technique should meet the earlier mentioned criteria. There are three candidates: balanced scorecard, benchmarking and the competitor cost assessment. The three techniques are compared on the formulated criteria.

All three techniques provide information about the current efficiency. Nevertheless, the competitor cost assessment is only focused on the cost side of the services. The balanced scorecard has the four perspectives of which the performance is regarded. However, not all the four perspectives are relevant. Benchmarking, by choosing the right indicators, can be adapted to provide only the relevant information. Balanced scorecard and benchmarking can both be applied to a non-competitive environment where a continuous service is delivered. For benchmarking an approach in collaboration with partners is developed in literature. Competitor cost assessment may be adapted to suit a non-competitive environment, but literature assumes a competitive environment. The balanced scorecard can point to potential improvement by clear operational objectives. Benchmarking is developed to identify the best practices of the benchmarking organisations and therefore can indicate at a later stage the potential improvements. Benchmarking meets the criteria best and is therefore preferred.

3 Introduction to benchmarking

The goal of this chapter is to provide a background review to achieve a better understanding of the benchmarking concept, in order to implement the benchmarking process in a later chapter.

Benchmarking has spread in the last decades from the Anglo-Saxon countries to become a worldwide phenomenon. A survey among the *Fortune 1000* made evident that sixty-five percent of the organizations use benchmarking as a means to gain competitive advantages. A similar survey in France conducted by *Chambre de Commerce et d'Industrie* estimates that half of the 1000 companies use benchmarking on regular basis (Anand & Kodali, 2008). In the 2015 edition of *Bain & Company's biannual Management Tools and Trends* surveyed that benchmarking is on the second place with a usage rate of forty-four percent. Benchmarking has also remained in the top ten management tools over a ten-year period (Madsen, Slåtten, & Johanson, 2017).

3.1 Definitions

In literature there are multiple definitions for benchmarking, but all include similar key themes. Ahmed and Rafiq (1998) find the following characteristics in the definitions of benchmarking analysed by them: (1) measurement via comparison, (2) continuous improvement and (3) a systematic procedure in carrying out benchmarking activity. Following Anand and Kodali (2008) the key themes identified in the benchmarking concept, include measurement, comparison, identification of best practices, implementation and improvement. These are present in one of the most common definitions of benchmarking: "*Benchmarking is the search for the best industry practices which will lead to exceptional performance through the implementation of these best practices*" (Camp, 1989). Following Francis and Holloway (2007) benchmarking from its inception has been a manner to find organization's activities which could be more efficient or effective by comparison with other relevant organisations. There are many definitions that describe the examination of practices as the most essential characteristic.

Best practices, in general, are regarded as the practices adopted by the best-performing companies. Any potential other factors, because of differences between companies, are not considered. In other words most best-practice studies do not pay attention to generalizability, not taking into account organizational context, resources deployed and influences of individuals (Castro & Frazzon, 2017; Francis & Holloway, 2007). In general, another assumption is that best practices lead to superior performance. A practice is then a process which is implemented by an organisation to improve the way it runs its business. Routines, a pattern of behaviour that is followed repeatedly, are the basic elements of a practice. Routines are usually stated by organisational rules and standard operating procedures (Castro & Frazzon, 2017). An example of a best practice is found in the paper of van Veen-Berkx, de Korne, Olivier, Bal, and Kazemier (2016), who benchmarked operation rooms of hospitals in the Netherlands. Using performance indicators, the benchmarking club found that some departments had, on average, more delay in starting an operation than others. Starting an operation later than scheduled, means that the operation room is not in use, which decreases the efficiency of the operation room. The better performing operation rooms had the practice of providing feedback directly when an operation was starting too late and had other

agreements concerning ‘intensive care unit bed release’. Taking over these practices by the less performing operations rooms, resulted in less delay. One of the operation rooms realised a reduction of 27,392 minutes per year, which meant a possible saving of $364,040 per year.

3.2 Categorization

There is an ongoing debate in literature about the categorization of the benchmarking tools (Anand & Kodali, 2008; Francis & Holloway, 2007; Madsen et al., 2017). It depends on the perspective of the author and the nature of the basis on which a categorization is made. Two common ways to categorize are covered here.

A first categorization of benchmarking is based on the historical development, also called the evolutionary approach. Kyrö (2003) identifies seven generations of benchmarking from the 1940s until now and observes an increase in sophistication. The first five generations are also identified by Ahmed and Rafiq (1998); Anand and Kodali (2008). The seven generations are: (1) Reverse benchmarking, (2) Competitive benchmarking, (3) Process benchmarking, (4) Strategic benchmarking, (5) Global benchmarking, (6) Competence benchmarking and (7) Network benchmarking.
First generation 'reverse benchmarking' is product oriented. In this kind of benchmark characteristics, functionality and performance of products are compared with offerings of competitors. Second generation 'competitive benchmarking' is about the comparison of processes of an organisation with competitors, the focus of the benchmark is shifted from the product to the process of developing the product. Third generation 'process benchmarking' is about comparing companies with companies outside their industry. It is based on the idea that lessons can be learned from companies outside of their own industry and information sharing is less restricted, because there is no competition between the companies. At the same time, a deeper understanding is required of the similarities between processes, which appear to be different on the surface. Fourth generation 'strategic benchmarking' is benchmarking on the level of strategy. It is a systematic process for the evaluation of strategies of external partners. The implementation of successful external strategies should lead to improved performance. At fifth generation 'global benchmarking', the previous generation is extended with a global orientation. Sixth generation 'competence benchmarking' also called 'bench-learning' is based on the idea that the grounds of organisational change processes lay in the behaviour of individuals and teams in the organisation. Organisations can improve their efficiency by developing competencies and skills and by learning collectively how to alter attitudes and practices. This more modern kind of benchmarking shifts the orientation from problem-based to process-oriented, which means that how things happen and how to apply them to the organisation has become more important than what is happening. The seventh generation 'Network benchmarking' adds the idea of learning with others to the foundation of benchmarking learning from others. This process can take place within or between organisations. This benchmarking is especially useful in the public sector. As public services in nature do not compete, but should provide the best possible service as effective and efficient as possible. If an organisation succeeds in finding a solution, it is supposed to be open for other public services.

Another kind of classification is based on the nature, content and purpose of the benchmark. There are multiple types for every aspect of classification. In Figure 1 the classification and meaning is shown (Anand & Kodali, 2008).

Classification	Type	Meaning
Nature of referent other	Internal	Comparing within one organization about the performance of similar business units or processes
	Competitor	Comparing with direct competitors, catch up or even surpass their overall performance
	Industry	Comparing with company in the same industry, including non-competitors
	Generic	Comparing with an organization which extends beyond industry boundaries
	Global	Comparing with an organization where its geographical location extends beyond country boundaries
Content of benchmarking	Process	Pertaining to discrete work processes and operating systems
	Functional	Application of the process benchmarking that compares particular business functions at two or more organizations
	Performance	Concerning outcome characteristics, quantifiable in terms of price, speed, reliability, etc.
	Strategic	Involving assessment of strategic rather than operational matters
Purpose for the relationship	Competitive	Comparison for gaining superiority over others
	Collaborative	Comparison for developing a learning atmosphere and sharing of knowledge

Figure 1: Classification and types of benchmarking

Anand and Kodali (2008) are critical about the classification of benchmarking based on an analysis of thirteen classification schemes. There seems to be overlap between one another and thus classifications seem to be inconsistent. The classifications could falsely suggest that there is a separate benchmarking process for each classification. Anand and Kodali (2008) propose to only classify benchmarking as internal or external. All other types can be subcategories of these two. However, regardless of what the subject may be, a benchmarking partner should be found internal or external to the organisation.

3.3 Benchmarking process in general

For the framework of the benchmarking process often a step-by-step plan is proposed. A step-by-step plan is a convenient way to run through the process of benchmarking. The papers of Anand and Kodali (2008); Camp (1992); Elnathan, Lin, and Young (1996) are selected to discuss the benchmarking process. The discussion of the benchmarking process by Camp is highly cited and acts as a basis for most literature (Anand & Kodali, 2008). Therefore, Camp's framework is regarded firstly, the other authors follow chronologically.

3.3.1 Paper of Camp (1992)

In 1979 the Xerox corporation performed a study to compare the US manufacturing costs with those of domestic and foreign competitors. The study revealed that competitors were selling products at the same price as Xerox's cost to produce them. As a consequence, Xerox quickly adopted external benchmarking to drive its business plan. The framework of Camp is based on the experiences of Xerox. Camp (1992) describes four phases in every benchmarking process with a total of ten steps.

I. Planning
    1. Identify what is to be benchmarked
       Every process has an output, which is a prior candidate to benchmark.
    2. Identify comparable companies
       Appropriate for comparison are world-class leadership companies or branches with superior work practices.
    3. Determine data collection method and collect data
       A wide array of sources can be utilised; a business library is a good starting point.

II. Analysis
    4. Determine current performance levels
       A full understanding of the internal business process is required before attempting to compare with external organisations.
    5. Project the gap between performance levels
       This provides an objective basis on which to act and to determine how to improve performance.

III. Integration
    6. Communicate benchmark findings and gain acceptance
       The findings should be communicated to all employees. Based on the benchmarking findings a vision can be developed.
    7. Establish functional goals
       Revise the goals in line with the found benchmarking results.

IV. Action
    8. Develop action plans
       Establish action plans with specifics for the actions, periodic measurements and assessment of the achievements.
    9. Implement specific actions and monitor progress
       Implement the established action plans and monitor the outcomes.
    10. Recalibrate benchmarks
       Stay current with the ongoing developments in industry by continuously benchmarking and by recalibrating the benchmark.

The purpose of benchmarking is primarily to set the direction of improvement in an organisation. It meets the need to establish more credible goals and pursue continuous improvement. It could legitimize goals because they are based on external reality. Another (traditional) alternative is by establishing targets by extrapolating trends and past practices, this method often fails because the external environment changes faster than projected. The bottom-line of benchmarking is competitiveness. It helps to draw a picture of how the operation should look to reach superior competitive performance.

3.3.2 Paper of Elnathan et al. (1996)

Elnathan et al. (1996) review the benchmarking process and provide three sets of variables which need to be considered before starting the benchmarking project:

1. Antecedent variables
    a. Results of a preliminary competitive analysis
    b. Degree of organizational commitment

    c. Prior benchmarking experience
2. Contextual variables
    a. Scope and areas selected
    b. Information gathering and sharing methods
    c. Partners selected
3. Outcome variables
    a. Non-financial quantitative measures
    b. Non-financial qualitative measures
    c. Financial measures

Firstly, the set of antecedent variables are discussed. These are about the necessary preconditions for successful benchmarking. (1a) Results of preliminary competitive analysis: The incentive for benchmarking could result from preliminary competitive analysis, either internal or external to the organisation. There are three (often dependent) reasons. Firstly, an organisation could suspect that its products are not in accordance with its design specifications. Secondly, the philosophy of continuous improvement could encourage the benchmarking initiative. Thirdly, there could be less systematic reasons such as management intuition that the products are not competitive. In many cases, analyses external to the organisation are conducted, for example by industry rankings of performance in trade journals. Customer and stakeholder feedback could be another external source, which encourages the benchmarking initiative. (1b) Degree of organizational commitment: For every new management innovation, it is key to obtain support from the senior management. The support of senior management can manifest itself in different ways. Firstly, senior management could provide the benchmarking staff with the necessary authority to motivate personnel. Secondly, senior management could authorize the funding required for the benchmarking process. Thirdly, senior management often has relationships with other firms, which could help to convince them to participate in the benchmarking project. Aside, another important aspect is a clear set of objectives. It is critical for benchmarking teams to have a clear view of the organizational mission before benchmarking commences. Without clear objectives an evaluation is problematic. A long commitment to benchmarking is necessary, since most organisation changes take up to three years. Therefore, it may take time for the benefits of benchmarking to be realised. (1c) Prior benchmarking experience: Experience in the organization improves the ability to identify appropriate areas for benchmarking within the organisation. Furthermore, experienced organisations are able to select the best benchmarking partners. In addition, experienced organisations are considered as more attractive benchmarking partners. For example, because of Xerox's reputation as an experienced benchmarking partner, it has become an attractive benchmarking partner. Xerox could use this as leverage when it chooses its benchmarking partners. Studies have found that experience and skills with benchmarking improve the efficiency of the benchmarking process. The actual level of training employees receive is critical for the successfulness of the benchmarking process as it improves the understanding of the benefits and limitations of the entire benchmarking process.

Secondly, the contextual variables are discussed; these variables may modify the specific nature of benchmarking. (2a) Scope and areas selected: the efforts in benchmarking should clearly identify a manageable product or process which needs improvement. Attempting a benchmarking effort which is unreasonable in size may reduce motivation and performance.

A study showed that is more favourable to do major improvements to the organisation's functioning rather than make small improvements to areas in which the organisation is already strong. I.e. typically, the larger the benchmarking gap, the greater the benefit from a benchmarking study. (2b) Information gathering and sharing method: two dimensions are related to this variable. Firstly, the type of information which benchmarking organisations collect and secondly, the method of information collection. Three major types of information that can be collected for benchmarking are distinguished: product, process and strategic benchmarking. These were, among others, already discussed in section 3.2. Secondly, two major methods for information collection are distinguished: unilateral (covert) and cooperative benchmarking. At unilateral benchmarking, information about the other organisation is acquired via public sources, there is no mutual agreement to share information. Whereas in cooperative benchmarking, there is an agreement to share information between the benchmarking companies. (2c) partners selected: Although it is an important part of the benchmarking process, there are no definitive answers to questions about size of partners, number of partners, relative position of the partners across and within industry and degree of trust required among partners. About the size of benchmarking partners, some authors reason that they should be of similar size, while others argue that this not a critical requirement. The optimal decision-making about the industry from which partners are selected is unclear. Bringing competitors into the benchmarking may require that proprietary information is disclosed. The benefit of acquiring relevant information from competitors should be more favourable than the downside of disclosing proprietary information to the competition. Concerning the number of partners, an initial increase benefits the benchmarking project, but a further increase causes issues to come into play, such as coordination, timeliness and concerns about proprietary information. I.e. the law of diminishing returns holds for the number of partners. The relative position of the organisation within an industry is another variable, an industry leader has other incentives for benchmarking than industry newcomers or those who have seen declining performance. Industry leaders may often receive praise for helping other less capable organisations, which may be an incentive to benchmark with industry newcomers. Nevertheless, industry leaders can afford to be highly selective about with whom they benchmark. Leading organisations may be willing to benchmark with leading organisations in other industries, assuming that the benefit of the project will allow them to maintain leadership in their own industries. A last and critical variable is the degree of trust. Obtaining true information on time is essential for the benchmarking to be successful. Most organisations operate on the basis of *quid pro quo*. This will often mean that only outdated information is provided as long as the other benchmarking partners are not trusted. Ultimately, the benchmarking partners will share information with each other which is usable.

Thirdly, the outcome variables are discussed which measure the outcome and effectiveness of the benchmarking project, which includes financial and non-financial measures. At the upside, (3a) non-financial quantitative outcomes include: improved quality, greater yield, reduced defectives, increased speed to market, faster on-time delivery and increased functionality. (3b) Non-financial qualitative measures could be change in how employees decide concerning ways to work or to solve problems. Other benefits might be increased motivation and satisfaction, improved cooperation and coordination among employees, better understanding of operations and an expanded opportunity set due to the information derived through benchmarking. (3c) Financial measures like reduced cost, increased sales or

increased income usually will result from this. At the downside, there are costs made for the benchmarking process. Traceable costs are expenditures due to the benchmarking process such as staff time for analysis, interpretation and implementation. The more difficult costs to trace are the cost related to cultural change in the organisation and the potential resistance to change.

3.3.3 Paper of Anand and Kodali (2008)

Anand and Kodali (2008) have the aim with their paper to benchmark the benchmarking models. For the benchmarking of the models, the framework of Camp is utilised. Thirty-five models are analysed with a total of seventy-one unique steps. As a result, the proposed benchmarking process consists of twelve phases, which include fifty-four steps. To keep this review of benchmarking process in the paper concise, only the phases are discussed.

I. Team formation: Compose a team, which will carry out the benchmarking study.
II. Subject identification: Identify the subject areas, which will be benchmarked.
III. Customer validation: Identify the key customers and its expectations, validate the topic for this.
IV. Management validation: Prepare mission of benchmarking, get commitment from the management
V. Self-analysis: Identify the indicators (or critical success factors) of the subject
VI. Partner selection: Identify the potential partners for benchmarking
VII. Pre-benchmarking activities: Establish a protocol as preparation for the benchmarking
VIII. Benchmarking: Perform the actual benchmarking study
IX. Gap analysis: Determine the competitive gap and its root causes.
X. Action plans: Report and communicate results from benchmarking, develop a plan with recommendations
XI. Implementation: Implement action plans to bridge the gap
XII. Continuous improvement: Monitor results of action plans, potentially recalibrate the benchmark

The fifty-four steps, which provide substance to the actions which should be performed, are distributed over the twelve phases. The structure and content show similarity with the framework of Camp (1992).

3.4 Benchmarking process sector specific

For the case, three sectors are identified as potentially related: facility management, health care and hotel services. For these three sectors, the literature about benchmarking in the sector is discussed.

3.4.1 Facility management

The literature describes multiple cases of benchmarking applied to facility management. On the papers (Loosemore & Hsin, 2001; Pitt & Tucker, 2008) some light is shed.

Loosemore and Hsin (2001) describe the development of benchmarking in facility management. The benchmarking process is based on the process proposed by Camp (1992)

with slight adaptations. Essentially, a benchmark is regarded as a point of reference, which serves as a standard to know the relative performance. Facility managers increasingly use key performance indicators (KPI) to measure the effectiveness of whole and subprocesses. The use of KPIs can have numerous advantages. For instance, KPIs can emphasise the managerial efforts on the relatively important areas. Moreover, KPIs can be incorporated into contracts, specifying clear expectations of desired outcomes and how they are monitored and controlled. An organisation should develop its own KPIs which reflect the relationship between facility management and its business objectives. Nevertheless, because of outsourcing, there is a danger that the KPIs reflect the performance of the outsourced organisations rather than how this translates into the performance of the business objectives. In the facility management of the health care sector, the KPIs of Table 6 were named by respondents.

Area	***KPI***
Plant and equipment	Response time
	Downtime
Lighting	Request for repairs
	Quality of lighting
	Lifetime of bulbs/strips
Swimming pool	Temperature of water
	Chemical balance of water
	Cleanliness of water
Television	Quality of picture
	Range of programs
	Timeliness of programs
	Number of complaints
Space management	Floor area/guest
Manpower	Productivity/staff member

Table 6: Examples of KPIs in hospital facility management

Pitt and Tucker (2008) have the objective to consider performance measurement in hard facility management in the light of benchmarking. Benchmarking is regarded as a performance measurement tool and a stimulant to achieve innovation in the industry. Many people assume that benchmarking is only cost related, but other aspects could also be benchmarked. Three examples of other aspects are: (1) Space use, a primary cost driver for premises cost, (2) the facility management, benchmarking the effectiveness of the facility management on a strategical or tactical level and (3) computer-aided facility management systems, benchmarking the effectiveness of the help desk. However, the number of models which link facility performance measurement to strategy is limited.

Performance measurement has three broad purposes. (1) To ensure the goals and objectives are reached, (2) to evaluate, control and improve processes and (3) to assess and compare the performance of different entities, such as organisations, teams and individuals. The performance measurement of facilities includes three main components, namely physical, functional and financial. Physical performance is about the behaviour of the building. Properties of behaviour are structural integrity, lightning and energy efficiency. Functional performance is about the relationship of the building with its occupiers, like space, layout and

ergonomics. Financial performance concerns the capital and recurrent expenditures and depreciation.
The performance measurement should be related to the core business objectives. KPIs should be chosen which are aligned with the core objectives. The KPIs could prove potential improvement in meeting the core objectives. KPIs could support the creation of a rank order among benchmarking criteria.

3.4.2 Health care

A model for benchmarking in the health care sector is introduced in the paper of de Korne et al. (2010). They construct the '4P model' as a conceptual framework for an international benchmarking initiative of nine hospitals.

The four required conditions for successful benchmarking are: (1) purposes, (2) performance indicators, (3) participating organizations and (4) performance management systems.
First, three purposes should be present at the benchmarking parties. Firstly, the purpose to learn from others. Secondly, the purpose to identify in relation to the other organisations the performance gaps. Thirdly, the purpose to look for the best practices among the benchmarking organisations. Second, the prerequisites for the performance indicators required are the following. Firstly, the indicators should be specific, measurable, acceptable, achievable, relevant and timely (SMART). Data should be converted into measurable quantities. Secondly, the indicators should be comparable to those of other organisations. Thirdly, the indicators should be relevant to the goal of the benchmarking. Third, there are three conditions for the participating organisations. Firstly, organisations should have similarities in structure, process and outcome. Secondly, there should be no competitive relationship between the benchmarking parties. Thirdly, the participation in the benchmarking process should be voluntary. Fourth, there are three conditions for the performance management system. Firstly, managers should have knowledge about the performance indicators in use. Secondly, to be effective on the performance, the benchmarking findings should be communicated to the stakeholders in the organizations. Thirdly, the benchmarking should be incorporated in the process of continuous quality improvement.
A total of nineteen performance indicators of the strategic dimensions, volume, innovation, human resource management, quality and safety and research and development were found to be in accordance with the requirements described. Indicators in the study were, for example, number of operations, sickness rate of employees, number of cancelled operations and number of scientific publications per full-time equivalent.
The authors found that benchmarking had benefits aside those mentioned in the literature. Participation to benchmarking is on itself regarded as a powerful sign that the organisation is investing in quality. According to one of the participants of the study "for our hospital, it's important to have some documents saying that we are performing well". Even in the case that the indicators are not perfect, there is something to show to external stakeholders. Another benefit was that benchmarking caused interaction between the participants. In hospitals side, visits were organised, which brought up changes which were often beneficial for patients.

3.4.3 Hotel services

Min, Min, and Chung (2002) did benchmarking of the hotel service quality of South Korean luxury hotels. The application of benchmarking in this sector is challenging due to the intangible nature of service quality. There are four steps in the benchmarking process applied to hotel organizations:

1. Identify and sort the services attributes by importance on the influence of the perception of customers
2. Develop service metrics
3. Identify the best-practice hotels and compare the hotel's service performance with that of the benchmark
4. Develop an action plan for continuous improvement

Service attributes are derived from generic determinants of service like reliability, responsiveness, courtesy and tangibles. Attributes found are divided into guest room values, e.g. cleanliness, quietness and comfort of the bed, and front-office services, e.g. courtesy of employees, handling of complaints and reasonable price. In this study, the responses to the attributes of 281 customers of eleven different hotels were collected. After quantitative analysis, the 'best-practice' hotel could be identified. Since the 'best-practice' hotel is identified, other hotels could identify their differences in practices to improve the service quality. As a result, an action plan could be drawn up.

4 Benchmarking step-by-step plan

In this chapter a step-by-step plan for benchmarking is presented, which is implemented at MST. The steps are based on the literature review of the last chapter and adapted, if necessary.

A convenient way to deploy benchmarking is by developing a step-by-step plan. This is also a common practice in literature. In literature, many different steps for this process are proposed. The information provided by previous chapter is the basis to provide a benchmarking step-by-step plan adapted to the case. The steps give substance to the phases of benchmarking and concretize the actions which need to be taken. The purpose of this step-by-step plan is to be a guide for the benchmarking process.

In the first instance, the process should be implemented to provide information about the current efficiency, which is given when step 6 is performed. In the future, the rest of the benchmarking process can indicate and implement potential improvements. The improvement is based on the finding of best practices.

4.1 Step 1: Receive fiat for benchmarking and form a benchmarking team

The incentives to perform benchmarking should be present at the organisation. Incentives could be about the organisation suspecting that their processes are not optimised or the organisation is striving for continuous improvement. Because of the incentive, the management and organisation are more likely to commit itself to the benchmarking project. The resources required should be made available. Afterwards, a benchmarking team can be formed. A benchmarking team consists of employees from inside the organisation, who are responsible for and manage the benchmarking project. It is an advantage if the team includes employees experienced with or trained for benchmarking. A leader of the team should be appointed.

4.2 Step 2: Identify the benchmarking subject

A clear picture is required of what is going to be benchmarked. The kind, scope and area of benchmark should be selected to focus the benchmarking effort. For instance, in this thesis, the benchmarking should have the subject of the problem statement. The area chosen should be important to the organisation and enough potential improvement should be expected. The size of the benchmarking operations should be manageable. The kind of benchmarking and thus the level on which is benchmarked should be specified. A proposal of the benchmarking should be submitted to the management to receive its fiat.

4.3 Step 3: Identify benchmarking partners

Partners for the benchmarking should be found, which perform comparable business functions and have an interest in the benchmarking project. Partners with superior work practices are preferable candidates. The partners should be convinced of the added value of the benchmarking. Voluntary participation is a critical factor for the benchmarking process. These partners can be sought for internally and externally. Internally is often only recommended in larger organisations, with multiple comparable departments. The benchmarking organisations should have similarities in structure, process and outcome. There is no golden rule for the number of benchmarking partners, but the added value of the

first few partners is higher than the second few partners. Because of this reason it is advised to only have a few benchmarking partners. To have a successful collaboration between partners, there should be no competition between the organisations. A certain degree of trust is required to successfully perform the benchmarking process.

4.4 Step 4: Identify the benchmarking criteria

The current situation should be understood by collecting and analysing the existing information on the subject to be benchmarked. Key is to find the benchmarking criteria which represent the performance of the benchmarking subject. The benchmarking criteria should be SMART, should allow comparison between the organisations and should be established in consultation with the benchmarking partners. A full understanding of the business processes is required to find the criteria of importance. For instance, the KPIs utilised in facility management could aid the choice of benchmarking criteria. It is not only important to have the benchmarking criteria, but also to describe the information gathering methods. A protocol for the data collection should be established and its confidentiality discussed.

4.5 Step 5: Perform the benchmarking study

The data required for the benchmarking is collected by all participating organisations. The information to collect is about the benchmarking criteria. The information should be processed and shown in an overview for convenient processing.

4.6 Step 6: Measure the gap between partners and establish goals for action plans

The benchmark is performed and the data can be reviewed. Now, the gap between partners can be measured and analysed. The possible causes of the differences which could be present should be identified. Better practices, but also other reasons, could be the cause. An analysis should provide a definitive answer. A feasibility study should determine whether the best practices found are adaptable to the other organisations. With the aid of previous analyses, functional goals can be established for the organisation. The goals project the expected improvement in the organisation. All stakeholders should be informed about the findings of the benchmarking study. Benchmarking could legitimize the determined goals, because they are based on an external reality, which should support consent and commitment for the implementation of the action plans developed at the next step.

4.7 Step 7: Develop action plans

From the ‘best-practice’ partner is learnt what the best practices are and how the best practices operate. An action plan is developed to implement the found best practices into the organisation. An action plan should encourage continuous improvement and include the practices to implement, a time frame and a manner to monitor the progress of implementation and outcomes.

4.8 Step 8: Implement the action plans and monitor progress

The action plans are implemented. It is important to continuously monitor the progress; the action plan should provide a guideline for this. The improvement should after full implementation be measurable by the benchmarking criteria, the gap between partners should, in the ideal case, be bridged.

4.9 Step 9: Recalibrate the benchmark

Before starting a new benchmarking cycle, it is a good practice to evaluate whether the benchmark process still serves the goals that were drawn up during the start and to evaluate the benefit and cost quantitatively and qualitatively. Adjustments could be made to the benchmarking to better serve or adjust its purpose. Another application is to find another area in the organisation to benchmark. The gained experience could simplify the new benchmarking process.

5 Application of benchmarking plan

To successfully implement benchmarking, the step-by-step plan of the previous chapter is implemented. The goal of this chapter is to describe and execute the process until step 4. Step 5 until the final step are beyond the scope of this project as agreed.

5.1 Step 1: Receive fiat for benchmarking and form a benchmarking team

RC contract management posed the problem described in the Problem statement. The analysis of the possible solution to the problem in Chapter 2 has shown benchmarking to be suitable. The benchmarking was therefore initiated by the management of RC contract management, which guarantees management commitment to the project. The benchmarking team consists of three people. In the lead is the author of the thesis and a contract manager and business analyst have a supportive role. The contract manager and business analyst have experience with benchmark-like initiatives.

5.2 Step 2: Identify the benchmarking subject

The Problem statement provides an analysis of the problem and the area of the problem. The benchmarking subjects are the three services of RC contract management: cleaning, textile, with sub-services service clothing and linen and patient nutrition. The benchmarking should inform the management of the services.

5.2.1 Cleaning

The main goal of the service is to keep the rooms inside the hospital clean in accordance with the specifications. Another subject, which received increased interest, is the perceived quality of cleaning. At this time, the subject is not explored enough to be a goal of the service.

The specifications for the result of the cleaning are described as follows. There are action-oriented and result-oriented specifications. Action-oriented specifications are actions which have to take place at every cleaning. For example, in an operation room (OR), all parts which could have been in contact with the patient or personnel should be wiped. Result-oriented specifications are about how the result should look like after cleaning. For example, a room should be visually clean after cleaning. This does not mean that every part of it should be wiped during every cleaning, only the parts which are visually not clean.

Different departments have different cleaning requirements. For example, the policlinic outpatients' department requests another type of cleaning than the nursing wards. Because of this reason, the cleaning of a square meter is not always comparable. At MST the following departments have different cleaning needs: policlinic outpatients' departments, nursing wards, hot floor and other. All these departments have a regular schedule for cleaning (*bestek*). Some departments have some cleaning activities, which are not a part of the regular work, in this thesis referred to as variable work.

At the policlinic outpatients' departments, consults are given to visiting patients during the day. None of the patients stay-over at this department. The consults are only given on working days at office hours. Because of this reason, most of the cleaning is done during the evening on working days. The specifications are mostly result-oriented.

At the nursing wards, there are only patients staying-over. The stay-overs occur during working days and weekends. Most cleaning is done during daytime, at all days of the week. There is a schedule for the cleaning of all rooms, this regular work is mostly result-oriented. If a patient is discharged, then extra cleaning is necessary, which is mainly action-oriented like cleaning the bed, if the patient had no infection. In case of an infection, the cleaning is more thorough to prevent any spreading of the infection through the hospital. At MST, there is a special team of cleaners, that is called after a discharge.
At the hot floor, the surgical procedures in the hospital take place. The cleaning here is at the end of the day and between operations. The cleaning of the OR at the end of the working day is the regular work. The cleaning between operations is variable work, since the number of operations can differ from day to day. At both, the cleaning is mostly action-oriented and consist not only of the floors and closets, but also of the equipment.
Other rooms are the general areas of the hospital, like the hallways and the waiting rooms. These areas mostly have requirements, which are result-oriented. The cleaning is often done during working days, throughout the day.

Although the window cleaning is also part of the cleaning, it is a very different process, then the other cleaning. It has only a small share in the total cost of the service. When cleaning is mentioned, the window cleaning is not in scope. The same holds to the outside of the building, like the terrain or the parking garage.

5.2.2 Service clothing

The main goal of service clothing is to provide clean service clothing of the right kind and size to the authorised employees of the hospital. After use, clothing should be taken in for reuse. Examples of service clothing are white jackets and pants in multiple sizes. At MST, the difference in clothing is based on the group. Examples of groups are doctors, nurses and kitchen personnel. At other hospitals, there are sometimes differences of clothing in the same group. For example, the nurses of different departments could have different clothing.

In Figure 2 an overview of the current process at MST is provided. At every process-block the activity and actor is shown. In this process, a clothing dispenser is utilised. The clothing dispenser is a machine with a line of hooks, at every hook a piece of clothing can be hooked. All pieces are equipped with an RFID tag. With the aid of these tags, the machine knows where each piece is present. A user can now go to the clothing dispenser to scan his badge. In a database, the clothing corresponding to the badge is looked up. Afterwards, the pieces of clothing are looked up and fetched by the machine and dispensed to the user.

There is also service clothing for the employees of the OR, for example for surgeons and assistants. This kind of service clothing is not part of the process, discussed earlier. Since it is only a small service with special requirements, this service is beyond the scope.

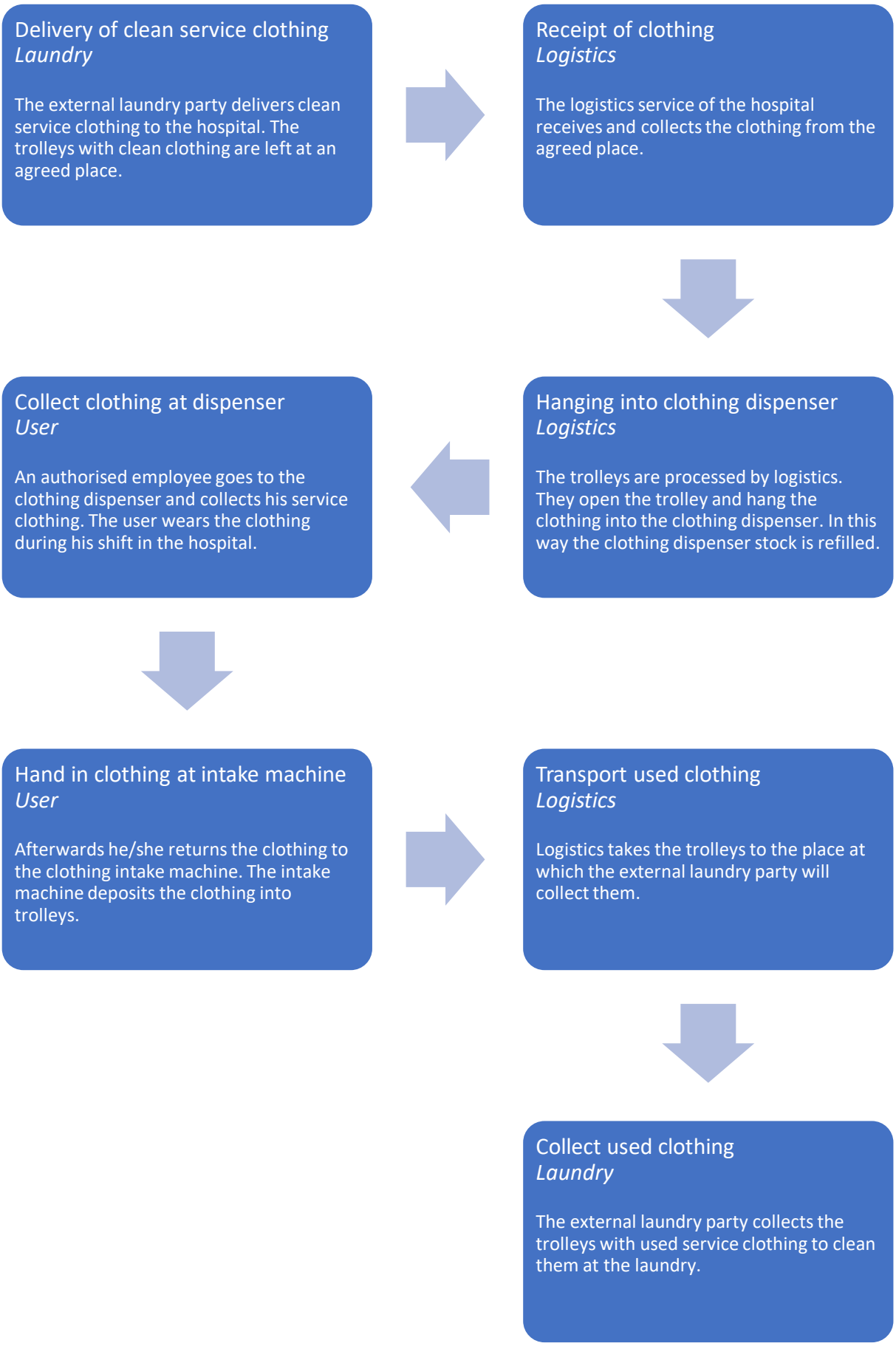

Figure 2: Process of service clothing

5.2.3 Linen

The goal of the service is to provide the right and clean linen to the departments of the hospital. Used linen should be returned to the laundry for reuse. Examples of linen at the nursing wards and OR are washcloths, thermal blankets, bed sheets, heat coats and medisuits. The linen service provides these and other linen throughout the whole hospital. The demand and use of linen differs per department, the largest consumption takes place at the nursing wards. The process steps of this service are shown in Figure 3.

In the hospital, curtains are found in the patient rooms and the showers. The curtains have a different process then the linen. Therefore, these are not a part of the linen.

5.2.4 Patient nutrition

The goal of the service is to provide nutrition to the patients of the hospital. In the last months another benchmarking initiative about this subject has started at MST. Therefore, the service is now beyond the scope of the project.

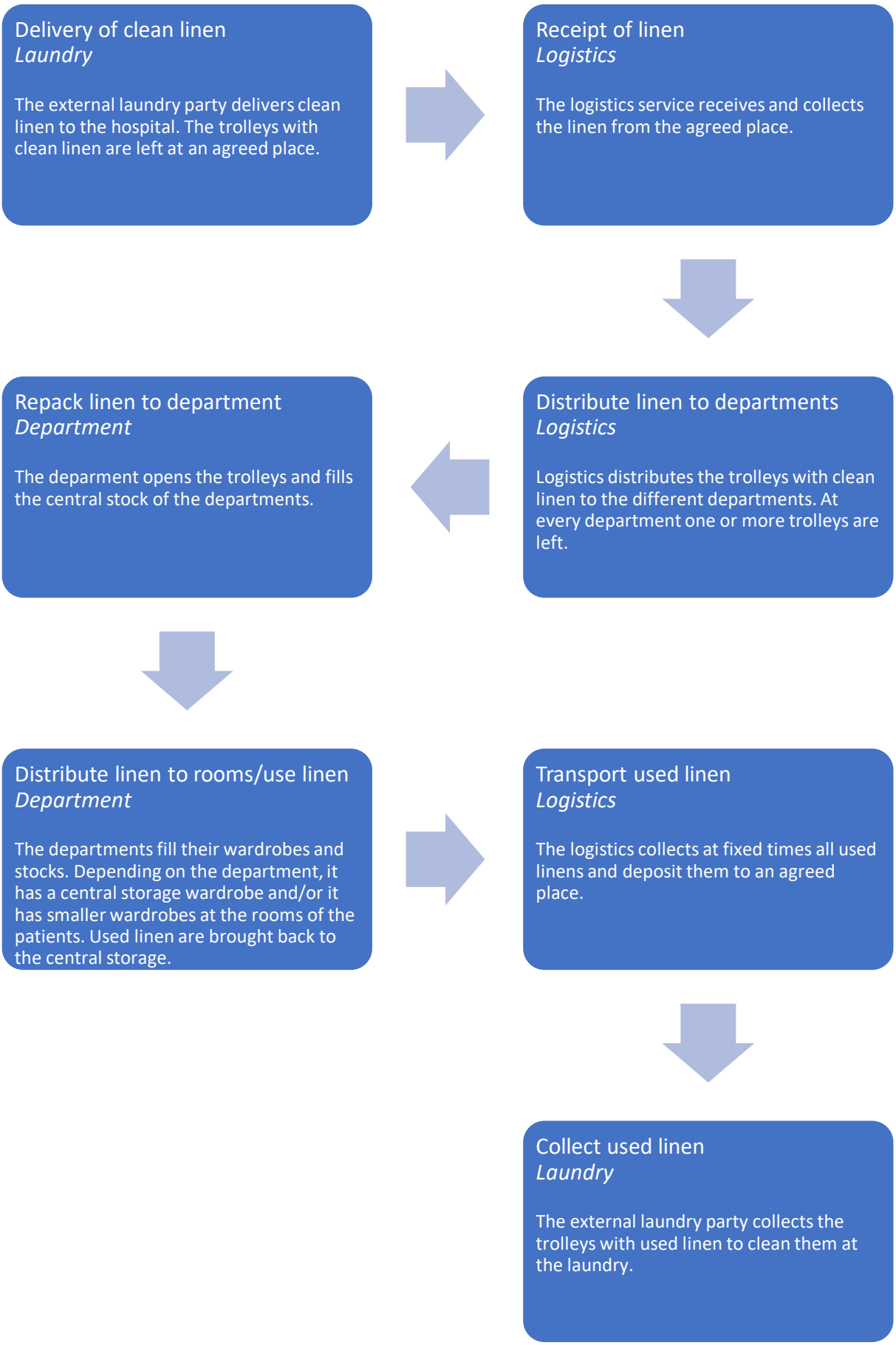

Figure 3: Process of linen

5.3 Step 3: Identify benchmarking partners

The partners perform similar business functions in a similar environment. A collaborative external benchmark is set-up, because this is most likely to provide most useful information. The benchmarking partners are found within Santeon, a collaboration of seven top-clinical hospitals in the Netherlands. Four of the six top-clinical hospitals agreed to cooperate with MST. These were the following: Canisius Whilhelmina ziekenhuis (CWZ), Catherina ziekenhuis, Maasstad ziekenhuis and Martini ziekenhuis. The characteristics of the top-clinical hospitals and the organisation of the services are shown in Table 7.

	Characteristics[4]		**Organisation**	
	Beds	**Employees**	**Cleaning**	**Laundry**
MST	600	2,800	Joint-venture	External
CWZ	460	3,600	Outsourced	External
Catherina ziekenhuis	660	3,600	Outsourced	External
Maasstad ziekenhuis	560	4,500	Outsourced	External
Martini ziekenhuis	580	2,900	Joint-venture	External

Table 7: Benchmarking partners characteristics and organisation

5.4 Step 4: Identify the benchmarking criteria

Section 4.4 described the conditions for the indicators of benchmarking. To have a review of the efficiency, it is important to regard the result of the service and the cost to achieve the result. On a lower level, the drivers of the cost are on review. The goal of the benchmark is to provide enough information for a first comparison. It may or may not be required to further inspect the details, after the data is collected, to identify the best practices. The benchmarking partners were interviewed about the goal and process of the services to check whether the services are comparable and about the benchmarking indicators. Another goal of the interviews is to involve the partners with the benchmarking and find indicators, which are supported by all partners. The factors of importance for the benchmarking of the services are discussed in this section. In Appendix I, the benchmarking indicators are shown in an overview. For details about the interviews, see Appendix II for the interview questions. Also, transcripts were made of the interviews. The transcripts are not attached, because of privacy reasons.

5.4.1 Cleaning

The main goal of the cleaning is to keep the rooms inside clean in accordance with the specifications. The specifications are, among others, related to the hygiene. The specifications could differ between the hospitals, but all have the goal to prevent infections and provide a safe environment for all persons present in the hospital. Because of these reasons, the hygiene is assumed to be the same between the hospitals. Another goal is related to quality of experience. This is about the perceived quality of the service by the persons present in the hospital. All benchmarking partners found this an important subject. However, not all the hospitals perform quality of experience assessments now. At those hospitals, which do not perform the assessment, the subject is still in development and will be applied in the near future. Because the different hospitals use different techniques and questionnaires to assess

[4] Medical specialists are excluded from employee number, source: https://www.santeon.nl/ziekenhuis/

the quality of experience, the proposal is to compare the results of the assessments on basis of rating levels, instead of grades. Grades suggest that a very accurate comparison between hospitals is done. Another subject is complaints and its registration. Because complaints vary in validity, severity and can be structural or incidental in nature, it is not perceived by the respondents as a measure of the result of cleaning. The question whether a complaints-registration system is present is added, because it reflects on the way in which complaints are handled.

The top-level comparison is to regard the quality of experience and the total cost of cleaning at the hospital and average this over the total net square meters. Net square meters concern the surface within the plinth of all rooms inside the hospital. Only the rooms inside the hospital are regarded, window washing is beyond the scope.

To provide more information about the cost structure, the following components of the cost structure are regarded in the benchmarking as shown in Figure 4. In the benchmark, the total cost per hour worked is shown, because personnel cost has a large share in the total cost.

Cleaning Cost Components	Total
	Personnel: Cost related to wages of cleaning personnel
	Material used: Cost for floating material
	Personnel-related: Cost for personnel cost, not related to wages
	Depreciation: Cost of the equipment in use by cleaning
	Overhead: Cost related to the management of the service

Figure 4: Cost structure cleaning

The foregoing provides very little information about the causes of differences. The proposal is to zoom in on the departments, because the departments have different cleaning needs and consequently have different processes (as described in section 5.2.1). The following four departments are identified as having their own cleaning requirements: policlinic outpatients' department, nursing ward, hot floor and other. One of the respondents does not support this division, as the cleaning could be (according to him) divided into three categories. The policlinic outpatients' department is in this case regarded as structured out of the other department (in terms of cleaning). Another respondent identified five types of departments, but the fifth type could easily be merged with the nursing wards and is therefore not regarded separately.
The next step is to highlight the departments and check for the factors which should be taken into account for a second-level comparison. The second-level comparison, will not detail out all difference which may exist between the same departments at different hospitals. But it provides a comparison on a level, which is more comparable in cleaning terms. The second-level comparison may trouble some benchmarking partners, because the data may be not available. In that case, the decision is up to the supplier of the cleaning services to share the required data.

5.4.1.1 Policlinic outpatients' department

At the policlinic outpatients' department, only the regular work (*bestek*) is regarded for the rooms which relate to the policlinic outpatients' department. The factors of interest for benchmarking are shown in Figure 5. On the first level, regular work is mentioned, this is to emphasize that only the regular work is in scope. At other departments, factor work could also be present. On the second level in the figure, the top factors shown are related to the result of cleaning.

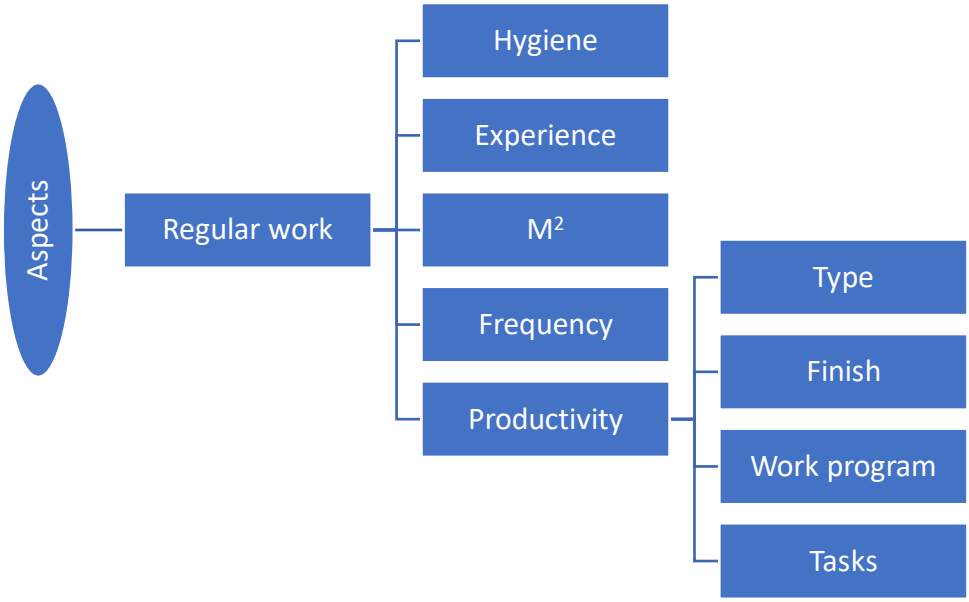

Figure 5: Policlinic outpatients' department cleaning factors for benchmarking

Hygiene

As stated earlier, the assumption is made that the hygiene between the hospitals is comparable. Because of its importance, it is added to the figure.

(Quality of) Experience

The way of assessing the quality of experience is not standardised. It is advised to compare the rating level of the experience assessments on the policlinic outpatients' department.

The next (lower) factors are related to the process and its cost drivers.

M^2

M^2 is the number of net square meters to clean. A comparison of the cost is made by averaging this over the factor, since the labour of cleaning on department level is largely related to the net square meters of floor to clean.

Frequency

This factor is about the number of cleanings that is done on the same square meter every week. This indicator is not utilised to average the cost, since the goal is to achieve the result. A higher or lower cleaning frequency may or may not be necessary to achieve this. A hospital has made its own trade-offs, on which the factor reflects.

Productivity
This is the number of square meters which are cleaned in an hour by the cleaning personnel. Worked hours is taken, because it has a large share in the cost. An average number is requested for the second-level comparison. Differences in these numbers could have many reasons. Four examples of factors are mentioned in Figure 5: The type of rooms, the finish of the room, the work program and tasks. There are many differences in the work program of the cleaning service in the hospitals, i.e. what should be cleaned. Another factor is that at some hospitals the cleaning is also responsible for some service tasks, which may have an influence on the productivity. These factors may be explanatory for productivity differences between hospitals.

5.4.1.2 Nursing ward

At the nursing ward, there are similarities with the policlinic outpatients' department in factors, see Figure 6. The difference is the addition of variable work. The regular work on factor level is comparable to the regular work of the policlinic outpatients' department. Therefore, the same factors are mentioned and the same cost comparison is proposed. Differences exist in the measure of the quality of experience, because patients stay over, they are more important in the experience measure. The productivity between hospitals may differ because of different tasks. At one of the hospitals, for example, the task to resupply the linen on the patient rooms is their responsibility. To equalize the nursing wards between hospital, the burn centre (*brandwondencentrum*), present at two partners, is excluded. It has other cleaning requirements, because it is a specialistic environment.

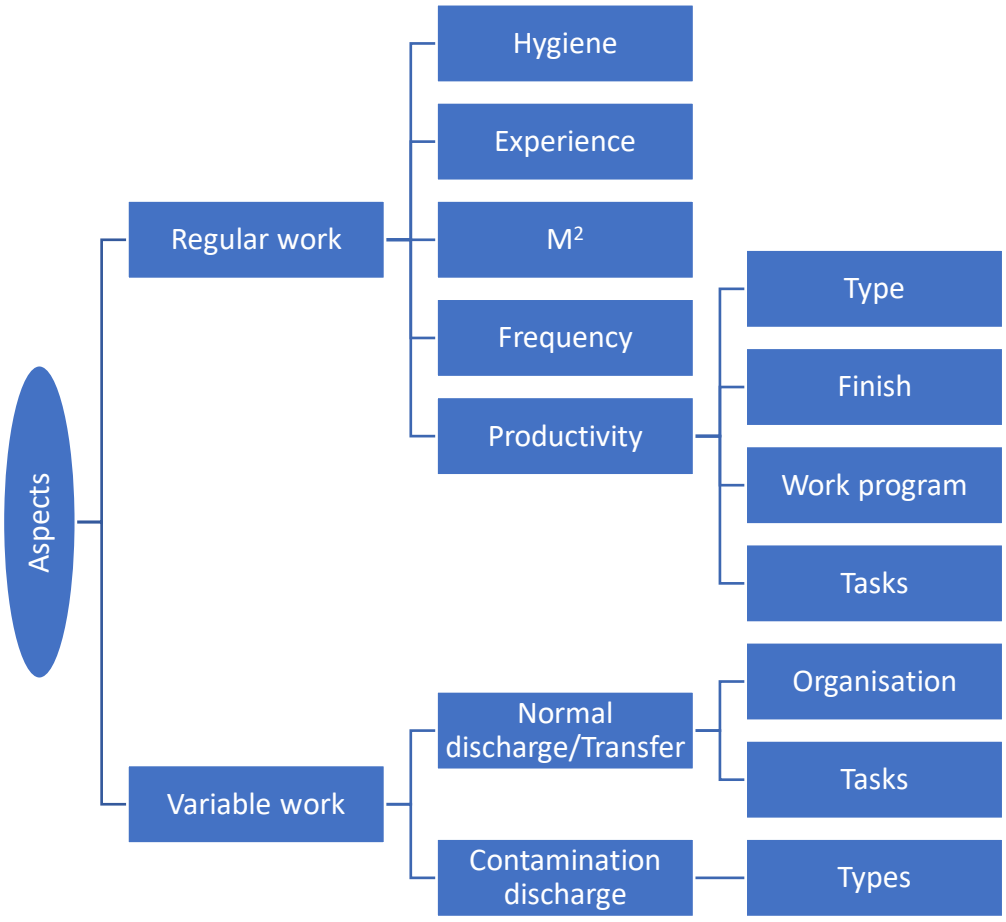

Figure 6: Nursing ward cleaning factors for benchmarking

The factor work is related to the discharge of a patient from the hospital.

Normal discharge/transfer
A normal discharge or transfer takes place, if the patient is not infected. At a normal discharge or transfer, at most hospitals, a cleaning occurs. This cleaning is executed by the cleaning or another patient-related service depending on the hospital. The factor organisation reflects on this. The tasks factor is about the difference in executed cleaning activities after discharge. Preferably, the costs are compared per discharge.

Contamination discharge
In the case that the patient was infected, an insulation cleaning (*isolatieschoonmaak*) is required. At all hospitals, the cleaning is responsible for this cleaning activity. The cost per contamination discharge could be compared between hospitals. In case of differences, the types of contamination and its associated cost should be reviewed.

5.4.1.3 Hot floor

At the hot floor, the ORs are present and the rooms which relate to it, like the recovery (*verkoever*). The factors of interest are shown in Figure 7. The different benchmarking partners use different terms for this department, like high risk, specialities or critical rooms (*kritische ruimtes*).

All the hospitals have regular work, which consists of the final cleaning (*eindschoonmaak*). This cleaning activity occurs after the closure of the OR at the end of the day. The hygiene of the hot floor is described in national standards and should, therefore, be comparable. At the ORs not only the floor and closets should be cleaned, but also, at many hospitals, the equipment. Consequently, the cleaning effort is more related to the number of ORs, than square meters, in contrast to the earlier discussed departments. The proposal is to have a first comparison based on the cost of cleaning per OR. Nevertheless, two of the benchmarking partners did not agree on this factor and proposed M^2. This is also included.

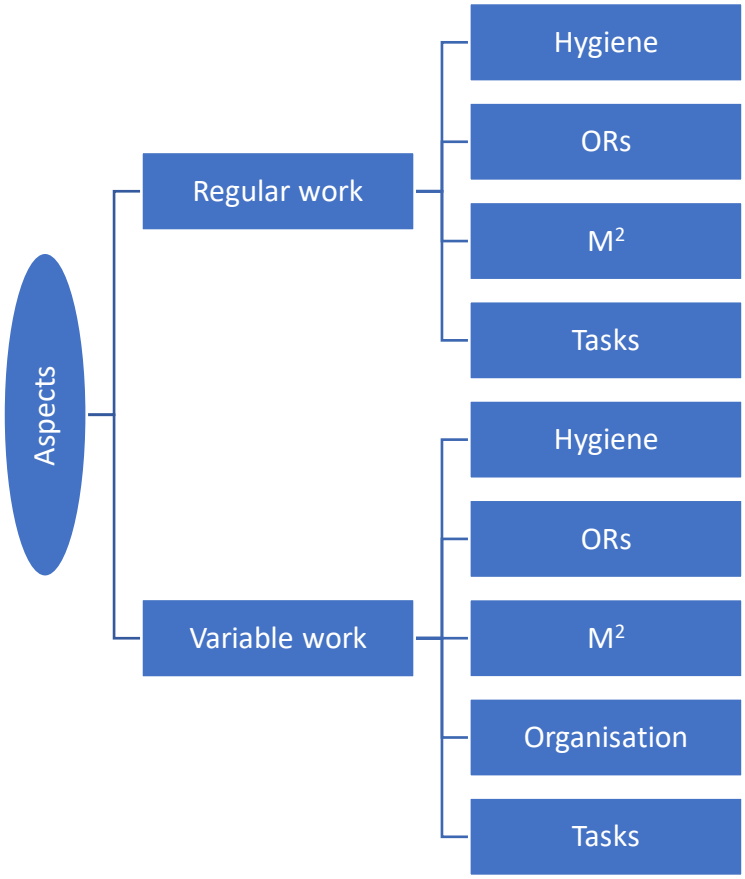

Figure 7: Hot floor cleaning factors for benchmarking

ORs
The number of (separate) ORs present at the hospital.

Tasks
The equipment of cleaning is not in all cases the responsibility of cleaning, this factor should show the differences between tasks at the hospitals. If the cleaning is not responsible for the cleaning of equipment, it is done by OR-assistants.

The factor work is related to the cleaning of the OR between operations. The hospitals have differences in the organisation. The responsibility can be at the cleaning or the OR-assistants. If the responsibility is at the cleaning, a cleaner could have a shift for this cleaning activity or could respond on call.

Organisation
This factor should provide a short description of the organisation of the variable work.

5.4.1.4 Other

The regular work here is comparable, in terms of factors, to the policlinic outpatients' department, see Figure 8. Note that the cleaning is only regarded inside the hospitals. For example, outside terrain maintenance is not regarded.

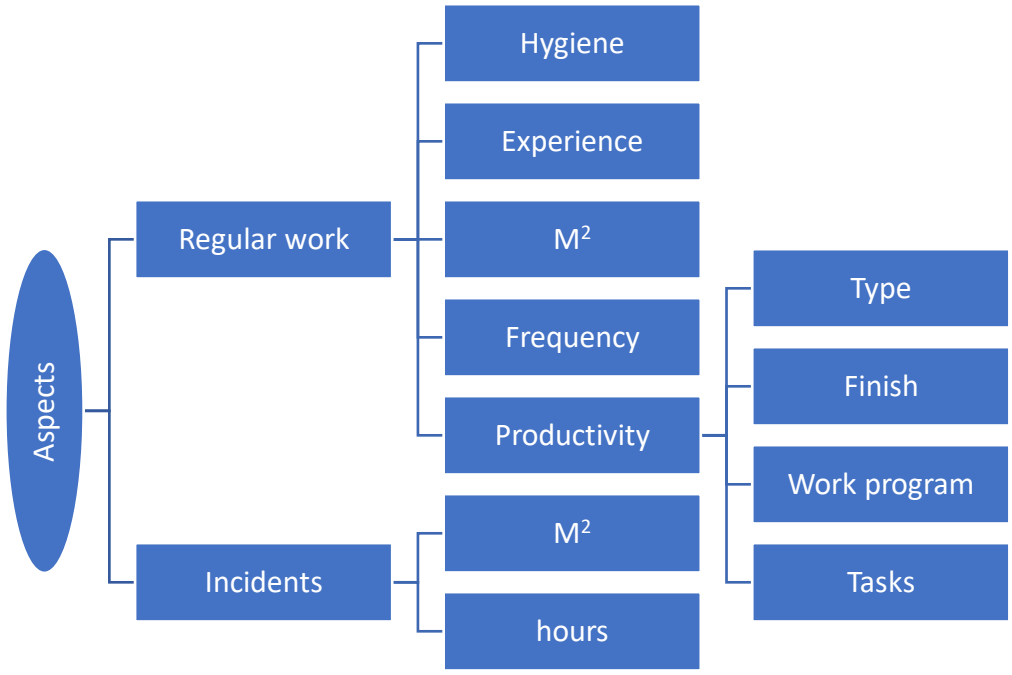

Figure 8: Cleaning of other rooms factors for benchmarking

Incidental cleaning is not considered as regular work. Not all hospitals recognise cleaning costs related to incidents. Because (small) incidental cleaning work is not the responsibility of the cleaning service or because incidents indicate shortcomings in the regular work. For the hospitals that recognise incidental cost, the cost is mostly registered. A comparison could be made on the basis of the worked hours and square meters.

5.4.2 Service clothing

The goal of the service is to provide clean service clothing to authorised employees. The service is almost the same for all users and at all hospitals a clothing dispenser is utilised. Every group of users or wearers has its own product range in the clothing dispenser. The benchmarking partners would like to do the comparison on the whole group and two subgroups. The first subgroup is the group who wears white service clothing (*witte dienstkleding*). Although all the hospitals have white service clothing, the groups of users which wear these service clothing differ. I.e. the definition of white service clothing does not entail the same user groups. To have a comparable user group, the subgroup of doctors and nurses is identified. Service clothing which is not distributed via clothing dispensers is excluded. For example, the service clothing of OR personnel is not distributed via the clothing dispenser. The important factors for a top-level comparison are the following.

Hygiene
This aspect is assumed to be the similar between hospitals, as the standards of cleaning at laundries, should prevent infections and deliver clean service clothing. There is a set of standards which the laundry follows to guarantee the result.

Success rate
The percentage of issues at the clothing dispenser, which is successfully fulfilled. Therefore, it is a measure of the availability of the service.

Active wearers
The quantity of the wearers, which made use of the service in the past 90 days. The choice is made, because wearers utilise the service and utilisation is the main cost driver of the service.

In Figure 9, the components of the cost structure are shown. Rent and washing are taken together, as most hospitals rent washed service clothing from the laundry. The rent is replaced by depreciation, if the hospital has the service clothing in own property. The cost of rent and washing is combined on the invoice of the laundry at some hospitals, therefore the components are combined. Rent and washing cover the cost paid to the (external) laundry, which also includes the transportation between laundry and hospital and other cost made by the laundry. Logistics is about the cost to move the service clothing between delivery point and the clothing machines. The clothing dispenser and intake machines incur maintenance and depreciation cost or lease. The overhead is about the cost of the management and personnel in the linen room, who are responsible for hanging the service clothing into the clothing dispenser.

Service clothing Cost Components	Total
	Rent (or depreciation) and washing: Cost paid to laundry
	Logistics: Cost of logistics inside hospital
	Maintenance and depreciation (lease): Cost of clothing machines
	Overhead: Cost of management and personnel linen room

Figure 9: Cost structure service clothing

On a second level, the process could be compared on a few aspects. These aspects are cost drivers of the service. An overview of factors of interest is provided in Figure 10. As discussed earlier the factors are reviewed for three groups.

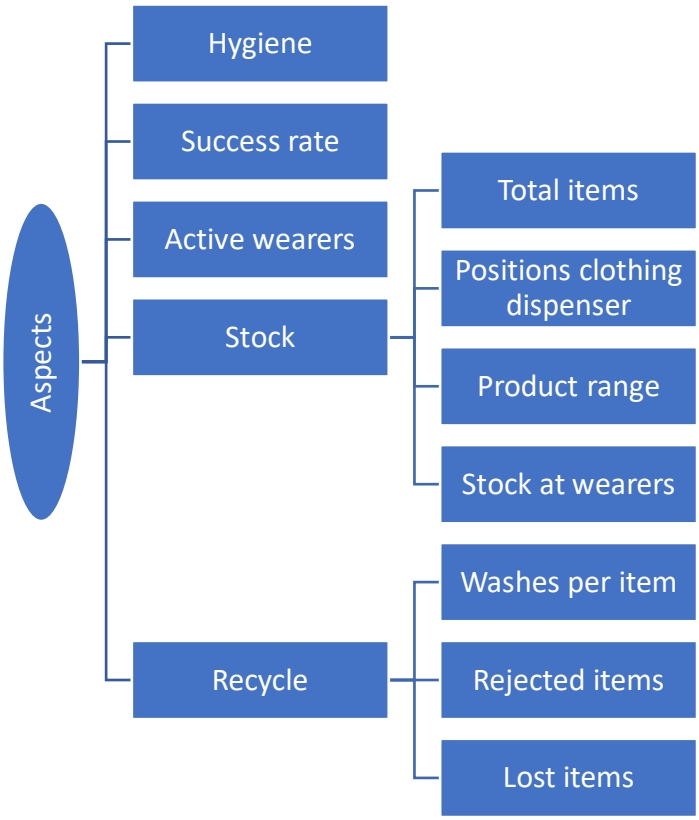

Figure 10: Service clothing factors for benchmarking

Stock
This category provides information about the stock and product range of service clothing.

Total
It is about the total number of pieces of service clothing. The clothing could be present at the laundry, at the hospital or be in transit. For the comparison, it should be averaged over the active wearers.

Positions in clothing dispenser
The number of positions present in the clothing dispenser. At every position, one piece of clothing can be hooked.

Product range
The number of unique (catalogue) items. The product range consists of products with their own stock listing or product code. Larger product ranges have more unique items, which need stock and positions in the clothing dispenser. Because of different user groups at the hospitals, it is difficult to compare. The subgroup of doctors and nurses should be uniform and offer a solution.

Stock at wearers
The part of the stock which is present at the users of the service. It reflects on the hoarding up of clothing by the users.

Recycle

Used service clothing should be returned for washing and reuse. This category reflects on the reuse of service clothing.

Washes
The average number of washes a piece of service clothing can endure, before replacement is needed.

Rejected items
The total number of items rejected by the laundry in a chosen time span and related costs. Examples of reasons for rejection are non-removable stains or holes in the clothing.

Lost items
The total number of items lost in a chosen period of time. For example, not brought back by the wearer. A lost item is defined as an item, which is collected by a user, but not brought back to the clothing intake machine in the following sixty days afterwards.

5.4.3 Linen

The main consumption of linen is at the nursing ward. The consumption of other departments is a fraction in relation to the nursing ward. Because of this reason, the linen are only regarded at the nursing ward. Only the nursing ward of the burn centre is excluded. For the OR a recommendation, which not only entails the linen, is done. The use of linen is very specific per sub-department of the nursing ward, as a consequence, it is difficult to directly compare. The curtains have a different process and are out of scope. The cost of the service can be divided into multiple components, which are shown in Figure 11.

Linen Cost Components	Total
	Rent and washing: Cost paid to laundry
	Logistics: Cost of logistics inside hospital
	Overhead: Cost of management

Figure 11: Cost structure linen

5.4.3.1 Nursing ward

On the top-level costs are compared per nursing days[5] and day nursing[6] combined. Because the laundry receives a payment, when the linen are delivered or handed in (used) at the laundry. The stock of linen and reuse is not a cost driver, in contrast to the service clothing.

[5] Following the definition of the Nederlands zorgautoriteit (NZA) for Nursing day (*Verpleegdag*) with code 190218. Handboek Gebruik zorgactiviteiten: Rertieved from https://werkenmetdbcs.nza.nl/documenten-ziekenhuiszorg/overzicht-releases/dbc-pakket-2015/rz15b/informatieproducten-2/7239-handboek-gebuik-zorgactiviteiten-v20141222/file on 09 May 2018.

[6] Following the definition of the Nederlands zorgautoriteit (NZA) for Day nursing (*Dagverpleging*) with code 190090. Handboek Gebruik zorgactiviteiten: Rertieved from https://werkenmetdbcs.nza.nl/documenten-ziekenhuiszorg/overzicht-releases/dbc-pakket-2015/rz15b/informatieproducten-2/7239-handboek-gebuik-zorgactiviteiten-v20141222/file on 09 May 2018.

The most important parameter is the number of pieces used by the departments, i.e. the consumption. In Figure 12, the factors of interest are shown. To compare the nursing wards, the proposal is to not only compare on a general level, but also on the level of typical nursing ward. A typical department is, for example, the internal medicine department. An example of a non-typical department, is the neonatology. The bed making can also be compared, since bed making is a large part of the consumption.

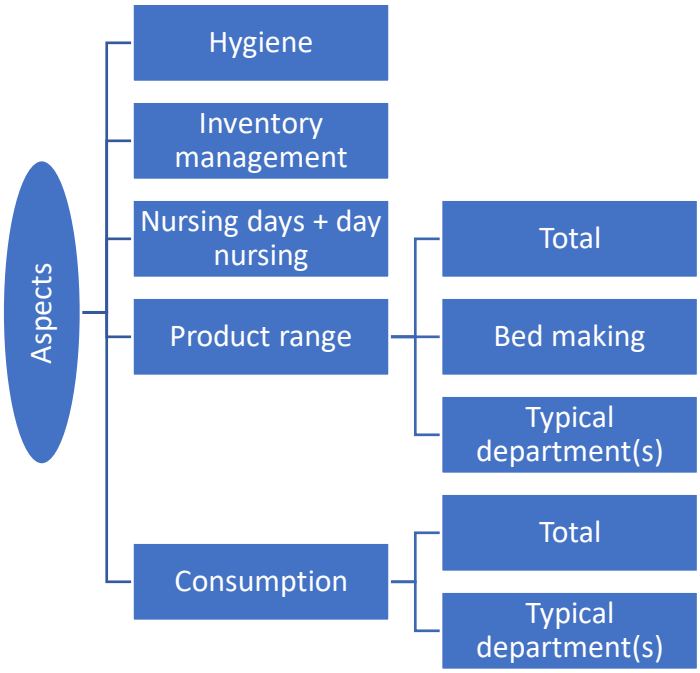

Figure 12: Linen factors on nursing ward for benchmarking

Hygiene
The hygiene of the linen at the hospitals is given in standards, which are at all laundries of the different Dutch hospitals.

Inventory management
The hospitals have some difference in how the inventory is managed. Some of the differences are shown in the benchmark, like counting frequency and linen storage places.

Nursing days and day nursing
These are standards at which Dutch hospitals measure the productivity of their nursing wards. A nursing day means that one patient is staying for the (a part of the) day and night. Day nursing, also called day intake (*dagopname*), is a patient which is taken in on the nursing ward before an operation or treatment.

Product range
The total number of unique items utilised at the nursing wards. It is reviewed on the general level, on a typical nursing ward and on bed making.

Consumption

The total cost and quantity of consumption. An average cost price per piece can be determined from this information. For the comparison, it should be averaged over the nursing days and day nursing combined.

5.4.3.2 OR

The consumption of linen on the ORs is very small and not part of the benchmark. If the ORs would be benchmarked, it is recommended to not only assess the linen, but to analyse the complete package of linen and disposables, which is utilised at every operation.

5.5 Step 5: Perform the benchmarking study

Now that all the factors of interest for benchmarking of the services are discussed, they are presented as indicators in an overview, shown in Appendix I. This and following steps are beyond the scope of the project as agreed.

6 Conclusions and recommendations

In this chapter, the conclusions, limitations and recommendations of the study are presented.

6.1 Conclusions

An analysis of the problem at MST resulted in the development of a way to assess the efficiency of the services under management by RC contract management. After an analysis of the ledger, it was found that cleaning, textile services and patient nutrition have a large share in the budget and budget deviation of RC contract management. Consequently, these services were singled out for the analysis. Patient nutrition was dropped at a later stage, when it was found out that a benchmarking initiative was already started.

The management accounting literature, especially the strategic management accounting literature posed multiple techniques or methods as a solution. Three techniques were regarded as potential candidates: balanced scorecard, benchmarking and competitor cost accounting. The choice was made to use benchmarking, because it was suitable for the problem and to the environment of MST. Since there is a collaboration of top-clinical hospitals (Santeon), at which support for benchmarking could be found.

Benchmarking is described as having the purpose to identify the best practices of performing a service. A comparison is done between organisation on basis of indicators. The organisation which delivers the best result on the indicators is regarded as the organisation with the best practices. In literature, not many specifics were found about the benchmarking of (soft) facility services, such as cleaning and textile, in a hospital environment. The literature mostly offered general step-by-step plans, examples, historical information and categories of benchmarking.

In benchmarking it is crucial to compare services, which are mostly similar in goal and process. In other words, comparing apples to oranges should be prevented. The benchmarking partners should be convinced of the goal of benchmarking and of the indicators at which the comparison is made. A trade-off is necessary between the level of detail in which the indicators compare the goal and process and the simplicity to get an overview and the data necessary for the indicators. To proceed pragmatically, the indicators should provide an overview and the required data should be collectable by the benchmarking partners.

The following conclusions are drawn about the services in regard. At the cleaning service, the most important aspect is the hygiene, which ensures a safe environment for personnel and visitors of the hospital. After the division of cleaning in four departments, square meters are considered the main driver of cost. Differences between hospitals are mostly present in the work program and the tasks of the cleaning. The work program is about what and how you clean. The tasks are about whether the cleaning service is responsible for more than only the cleaning of the hospital. At the textile service, there are two sub-services, service clothing and linen. At both, the availability of clean textile is the most important aspect of the service. At the service clothing, all benchmarking partners utilise a clothing dispenser and clothing intake machine, which ensures the process is comparable between hospitals. The active wearers are the main driver of cost. Differences are present in the number of user groups in the active wearers and the stock present in the clothing dispenser. At the linen, the consumption is only of importance on the nursing wards. The number of nursing days and day nursing relate to the consumption. Because of the variety in use of linen at the different nursing ward departments, the proposal was made to also compare a typical nursing ward department and the bed making.

As a result, the benchmarking indicators were formulated. The rest of benchmarking process can be executed.

6.2 Limitations and recommendations

The benchmarking process is not fully executed. However, the groundwork for the benchmarking is laid. The goals and indicators are set and the next steps can be executed. Execution of the whole process can answer the research question. Therefore, the main recommendation is to continue the benchmarking.

During the process of benchmarking, the partners were involved at a late stage. An earlier involvement of partners, gives room to the partners to participate in the decision of benchmarking subjects and thereby increase their cooperation.
The interviews were held with partners, without preparation at the partners' side. Asking to think about the benchmarking indicators beforehand, may improve the discussion about indicators.
During this study, benchmarking partner MST was also interviewed about the services in a less systematic way. It may improve the benchmark, to act like an independent consultant and to hold the same interview with MST as with the other partners.

The quality of experience is an indicator in the benchmark of the cleaning, however, the subject may not be defined and measured by all partners in the same way. The potential downside is that quality of experience may not be comparable between hospitals. An investigation into the concept of quality of experience could, therefore, enhance the benchmarking. This investigation should not only show the content of the subject, but also the differences in the concept and measurement between the hospitals.
Registered complaints were not included in the benchmark of cleaning, because of variety in the category and seriousness of complaints. Nonetheless, it could enhance the benchmark, if the complaints are categorised. An analysis could be done about the registration, number and differences in complaints at the hospitals. This analysis may find a way to add complaints to the benchmarking.
The service clothing of the OR was not in the scope of the benchmark, since many respondents did not fully appreciate the value for benchmarking. Furthermore, this service clothing has their own process for distributing and cleaning within the textile service. Although, most respondents did not fully appreciate the value, one of the respondents found it of importance. An analysis could give a decisive answer on its value for benchmarking.

Some benchmarking partners have formulated KPIs for the cleaning and service clothing. An analysis could be executed about the similarities and differences in KPIs between the different hospitals. This may enhance the insight on the performance management of the services.
There are differences in how patient-related services are structured at hospitals. For example, the department assistent is not present at all the hospitals. The choices to assign certain tasks to the different patient-related services could be investigated. This investigation may advise over the benefits and downsides of possible structures.
The hospitals offer many other services, which may benefit from a benchmarking initiative. This study did not find services that could evidently be benchmarked. An analysis may show other services of the hospital suitable for benchmarking.

In general, for benchmarking, it is recommended to have a step-by-step plan prepared before starting. Consider involving benchmarking partners at an early stage, maybe before the choice of subject and stay as independent as possible, when processing inputs received from partners. This way may ensure that all the partners are heard at the same extent.

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Appendix I: Benchmarks

Benchmark of cleaning (Inside hospital, no window cleaning & burn center)	CWZ	Catharina	Maasstad	Martini	MST	Benchmark
General						
Organisation structure						
Complaints registration						
Quality of experience						
Square meter (M^2)						
Policlinic						
Nursing ward						
Hot floor						
Other						
ORs						
Cost/M^2						
Productivity (M^2/hour)						
Cost (Structure)						
Personnel (wages)						
Material						
Personnel-related						
Depreciation						
Overhead						
Cost/hour						
Personnel (wages)						
Cost (Department)						
Policlinic						
Nursing ward						
Hot floor						
Other						
Policlinic outpatients' department						
Regular work						
Experience						
Cost/M^2						
Frequency						
Productivity						
Nursing ward						
Regular work						
Experience						
Cost/M^2						
Frequency						
Productivity						
Variable work						
Discharge (normal)						
Cost/discharge						
Organisation						
Tasks						
- Bed						
- Room						
Discharge (contamination)						
Cost/discharge						
Hot floor						
Regular work						
Cost/OR						
Cost/M^2						
Equipment cleaning						
Variable work						
Cost/OR						
Cost/M^2						
Organisation						
Equipment cleaning						
Other						
Regular work						
Experience						
Cost/M^2						
Frequency						
Productivity						
Incidents						
Cost/hour						
Cost/M^2						

Benchmark of service clothing	CWZ	Catharina	Maasstad	Martini	MST	Benchmark
(Only via clothing dispenser)						
General						
Active wearers						
- White						
- Doctors & nurses						
Stock						
- White						
- Doctors & nurses						
Success rate %						
Cost/active wearer						
Cost (structure)						
Rent/depreciation and washing						
Logistics						
Maintenance and depreciation/lease machines						
Overhead						
Stock						
Total/active wearers						
- White/active wearers						
- (Doctors & nurses)/active wearers						
Positions clothing dispenser						
- /active wearers						
Product range						
- White						
- Doctors & nurses						
Stock at wearers/active wearers						
Recycle						
Washs per item						
- White						
- Doctors/nurses						
Rejected items						
- /active wearers						
- Cost						
Lost items						
- /active wearers						
- Cost						

Benchmark of linen	CWZ	Catharina	Maasstad	Martini	MST	Benchmark
(Only nursing ward, no burn center, no curtains)						
General						
Nursing days						
Day nursing						
Beds						
Consumption						
Cost/(Nursing days + Day nursing)						
Pieces/(Nursing days + day nursing)						
Cost/piece						
Cost (structure)						
Rent and washing						
Logistics						
Overhead						
Inventory management						
Delivery frequency						
Counting frequency						
Storage						
- Linen room						
- Linen closet department						
- Linen on patient room						
Product range						
Typical nursing ward						
Nursing days						
Day nursing						
Beds						
Consumption						
Cost/(Nursing days + Day nursing)						
Pieces/(Nursing days + day nursing)						
Cost/piece						
Inventory management						
Delivery frequency						
Counting frequency						
Storage						
- Linen room						
- Linen closet department						
- Linen on patient room						
Product range						
Bed making						
Cost						
Product range						

Appendix II: Interview questions

Version of 18 April 2018 (Dutch)

Intro

Als student van het masterprogramma Business Administration aan de universiteit Twente ben ik bezig met een afstudeeropdracht bij MST. Istvan Haarman van de afdeling contract- en leveranciersmanagement van MST heeft mij gevraagd om te onderzoeken hoe efficiënt de facilitaire diensten zijn, te weten: schoonmaak en textiel. Om hier invulling aan te geven heb ik meerdere mogelijkheden onderzocht binnen management accounting. De benchmarking techniek lijkt de beste uitkomst te bieden voor deze situatie.

Graag wil ik een interview houden om een externe benchmark te kunnen opzetten, deze zou eventueel de prestaties van meerdere partijen met elkaar vergelijken en kan alle betrokken partijen meer inzicht geven in hun prestaties. Om dit te doen, zijn er indicatoren nodig op welke de vergelijking gemaakt kan worden. Ter voorbereiding heb ik gezocht naar zaken die voor MST belangrijk zijn. De volgende stap zijn de zaken die voor de andere ziekenhuizen belangrijk zijn. Voor benchmarking is het belangrijk dat alle belanghebbers inspraak hebben over de indicatoren. Door middel van dit interview zou ik uw opinie willen verkrijgen over dit onderwerp. Tijdens het interview zal ik de diensten schoonmaak en textiel afzonderlijk behandelen. Als introductie wil ik het graag hebben over het doel van diensten en hoe het proces eruitziet bij uw ziekenhuis. Het doel hiervan is om een beeld te krijgen van de eventuele verschillen. Daarna zou ik willen bespreken hoe we een vergelijking kunnen maken tussen de verschillende ziekenhuizen.

Het staat u vrij om uzelf op elke moment terug te trekken uit dit onderzoek. Het eindverslag van het gehele onderzoek is openbaar. In het eindverslag zal geen informatie staan die direct herleidbaar is tot uw persoon. Het interview zal worden opgenomen om het te kunnen verwerken. Deze opname kan worden verkregen bij mij. Een transcript van het interview kan eventueel geanonimiseerd opgenomen worden in de bijlage van het eindverslag.

Vragen

(De zinnen met opsommingstekens op het derde en vierde niveau zijn suggesties voor tijdens het interview. Als geïnterviewde ander suggesties heeft, wordt hier verder op ingegaan.)

Algemeen

- Wat is uw naam en functie?
- Bij welke organisatie werkt u?
- Welke diensten zijn volgens u interessant om te benchmarken (binnen het facilitaire domein)?

Bij MST ben ik gevraagd om twee diensten schoonmaak en textiel te beschouwen. Ik zal nu ingaan op de eerste van de twee diensten.

Schoonmaak

Als eerst zou ik het willen hebben over dienst in het algemeen.

- Hoe zou u het doel van de dienst formuleren?
    - Uit welke aspecten bestaat dit doel?

- Hoe ziet het proces van schoonmaak eruit?
    - Kunnen de verschillen in het proces gecategoriseerd worden naar afdeling?
        - Welke afdelingen worden onderscheiden?

Als we de totale kosten van de dienst beschouwen op het ziekenhuisniveau en deze zouden willen opdelen (zonder onderverdeling naar afdelingen te maken) zoals bijvoorbeeld personeelskosten en materiaalkosten.

- Welke onderdelen in de totale kosten zijn dan belangrijk?
    - Hoe worden deze gesorteerd naar hun aandeel in de totale kosten?
        - Schoonmaakpersoneel
        - Materiaal
        - Overhead

Als we nu zien dat het ene (topklinische) ziekenhuis een bedrag x uitgeeft aan de schoonmaak. En een ander (topklinische) ziekenhuis een bedrag y. En het doel is om appels met appels te vergelijken.

- Zou het dan een idee zijn om de eerste opdeling te maken naar algemene afdelingen, zoals polikliniek, VP, hot floor en overige?

Om deze reden, zou ik de schoonmaak per afdeling willen beschouwen.
Na de afdelingen wil ik ingaan op kosten ongerelateerd aan de afdelingen, deze zijn bij MST aanwezig.

Schoonmaak op polikliniek

- Welke indicatoren zouden belangrijk zijn om de kosten van beide ziekenhuizen te vergelijken?
    - Zouden deze in het resultaat van de dienst aanwezig kunnen zijn?
        - Wat houdt deze indicator in?
        - Hoe wordt dit gemeten? En wordt dit al gemeten?
        - Zijn deze te kwantificeren? En te vergelijken?
        - Behoeft de indicator een correctie voor de vergelijking?
            - Mate van hygiëne
            - Belevingskwaliteit
            - Klachten/polibezoek
            - (Eerder genoemde aspecten)
    - Zouden deze aanwezig kunnen zijn in het proces?
        - Zou de indicator/variabel zo verwerkt kunnen worden dat deze de kosten corrigeert of zou deze los beschouwd moeten worden (kostenverklaarder)?
            - M2
            - Gem. Frequentie
            - Gem. Norm (m2/uur)

Schoonmaak op verpleegafdelingen

- Welke indicatoren zouden belangrijk zijn om de kosten van beide ziekenhuizen te vergelijken?

  Bij MST wordt er op de verpleegafdeling een onderscheid gemaakt tussen vast en variabel werk op de verpleegafdeling.
    - Wordt deze onderscheiding ook bij uw ziekenhuis gemaakt?

  Het proces op de verpleegafdeling kan worden opgedeeld naar vast werk en variabel werk. Deze hebben hun eigen afhankelijkheden, daarom wil ik ze los beschouwen.
    - Zouden deze aanwezig kunnen zijn in het vaste werk van het proces?
        - Kosten
        - Bedden/patiënten *(correctie voor* aantal bedden per kamer)?
        - M2
    - Zouden deze aanwezig kunnen zijn in het variabele werk van het proces?
        - Ontslag + overplaatsing
            - Normaal/besmetting
    - Zouden deze in het resultaat aanwezig kunnen zijn van dienst?
        - Mate van hygiëne
        - Belevingskwaliteit
        - Klachten/bed

Schoonmaak op Hot floor

- Hoe is de schoonmaak op de hot floor geregeld?
    - Is er vast en variabele werk?
        - Is het variabele werk ook de verantwoordelijkheid van de schoonmaak?
- Welke indicatoren zouden belangrijk zijn om de kosten van beide ziekenhuizen te vergelijken?
    - Zouden deze in het resultaat aanwezig kunnen zijn van dienst?
        - Hygiëne
    - Zouden deze aanwezig kunnen zijn in het proces?
        - OKAR-kamers/tijd
        - M2
        - Duur
    - Zijn er nog andere zaken die verschillend kunnen zijn op schoonmaak op deze afdeling?

Schoonmaak op algemene ruimtes

- Welke indicatoren zouden belangrijk zijn om de kosten van beide ziekenhuizen te vergelijken?
    - Zouden deze in het resultaat aanwezig kunnen zijn van dienst?
        - Hygiëne
        - Belevingskwaliteit
        - Klachten
    - Zouden deze aanwezig kunnen zijn in het proces?
        - M2

- Zijn er nog andere zaken die verschillend kunnen zijn op schoonmaak op deze afdeling?

Bij MST wordt er buiten het reguliere werk op de afdelingen nog kosten gemaakt voor incidentele schoonmaak. Hiervoor wordt personeel opgeroepen buiten de vaste diensten voor zaken zoals opruimen braaksel, bloed of koffievlekken.

- Worden dit soort kosten ook bijgehouden bij uw ziekenhuis?
  (Zo ja)
  - Hoe zouden we deze kosten kunnen vergelijken tussen ziekenhuizen?
    - Polibezoeken

  (Zo nee)
  - Zouden deze kosten ook verdeeld moeten worden naar de afdelingen?

Dienstkleding (Textiel)

De textiel of wasserij dienst kan bij MST worden onderverdeeld in twee sub-diensten. Het verschaffen van dienstkleding aan medewerkers en het verschaffen van linnengoed aan de afdelingen.

- Is deze verdeling voor uw ziekenhuis ook van toepassing?
  - Is het voor een benchmark van belang dit onderscheid te maken?

- Hoe zou u het doel van de dienst dienstkleding formuleren?
  - Uit welke aspecten bestaat dit doel?
    - Beschikbaarheid
    - Hygiëne
    - Gebruikerstevredenheid
  - Zijn deze doelen voor alle gebruikers van de dienst hetzelfde?

- Uit welke processtappen bestaat de dienst?
  - Welke stappen worden door het ziekenhuis zelf uitgevoerd?
  - En welke stappen door een externe organisatie?

(Controleer of er gebruik wordt gemaakt van een kledinguitgifteautomaat (KUA) en/of externe levering, ondersteun, indien nodig, vinden processtappen d.m.v. vergelijking met MST proces.)

Als we de totale kosten van de dienst beschouwen op het ziekenhuisniveau en willen deze opdelen naar onderdelen (zonder onderverdeling naar gebruikers) zoals bijvoorbeeld huur en waskosten.

- Welke onderdelen in de totale kosten zijn dan belangrijk?
    - Huur en waskosten
    - Logistieke kosten
    - Onderhoud en afschrijving
    - Overhead

Als er nu wordt aangenomen dat een ziekenhuis een x bedrag uitgeeft aan dienstkleding. En een ander ziekenhuis een y bedrag.

- Welke indicatoren zouden belangrijk zijn om de kosten van beide ziekenhuizen te vergelijken?
    - Zouden deze in het resultaat aanwezig kunnen zijn van dienst?
        - Hygiëne
        - Gebruikerstevredenheid
        - Misgrijpen
    - Zouden deze aanwezig kunnen zijn in het proces?
        - Actieve dragers
        - Kledingpool
            - Totaal/
            - Posities in KUA/
            - Unieke items
                - Maatgebonden
                - Persoonsgebonden
        - Hergebruik
            - Gem levensduur pool
            - Afgekeurde stukken
            - Verloren stukken

Linnengoed (Textiel)
Nu de dienstkleding dienst behandeld is, wil ik ingaan op het linnengoed.

- Hoe zou u het doel van de dienst formuleren?
    - Uit welke aspecten bestaat dit doel?
        - Beschikbaarheid
        - Hygiëne
        - Gebruikerstevredenheid

- Uit welke processtappen bestaat de dienst?
    - Welke stappen worden door het ziekenhuis zelf uitgevoerd?
    - En welke stappen door een externe organisatie?

(Indien nodig, vinden processtappen d.m.v. vergelijking met MST proces.)

Als we de totale kosten van de dienst beschouwen op het ziekenhuisniveau van dienst en deze willen opdelen in onderdelen (zonder onderverdeling in afdelingen) zoals bijvoorbeeld huur en waskosten.

- Welke onderdelen in de totale kosten zijn dan belangrijk?
        - Huur en waskosten
        - Logistieke kosten
        - Overhead

Als er nu wordt aangenomen dat een ziekenhuis een bedrag x uitgeeft aan het linnengoed op een afdeling. En een ander ziekenhuis een bedrag y.
Bij MST is me opgevallen dat elke afdeling een ander linnenverbruik heeft.

- Zou het dan een idee zijn om de eerste opdeling te maken naar afdeling, zoals polikliniek, VP, hot floor en overige?
    - Zijn alle afdelingen relevant voor de beschouwing?

Linnengoed op polikliniek

- Welke indicatoren zouden belangrijk zijn om de kosten van beide ziekenhuizen te vergelijken?
    - Zouden deze in het resultaat aanwezig kunnen zijn van dienst?
        - Beschikbaarheid
        - Hygiëne
        - Gebruikerservaring
    - Zouden deze aanwezig kunnen zijn in het proces?
        - Polibezoeken
        - Pool
            - Aantal items/
            - Unieke items
        - Hergebruik
            - Gem levensduur pool
            - Afgekeurde stukken/
            - Verloren stukken/

Linnengoed op verpleegafdeling

- Welke indicatoren zouden belangrijk zijn om de kosten van beide ziekenhuizen te vergelijken?
    - Zouden deze in het resultaat aanwezig kunnen zijn van dienst?
        - Hygiëne
        - Gebruikerservaring
        - Nabestellingen
    - Zouden deze aanwezig kunnen zijn in het proces?
        - Bedden/verpleegdagen+dagverpleging
        - Pool
            - Aantal items/
            - Unieke items
        - Hergebruik
            - Gem levensduur pool
            - Afgekeurde stukken/
            - Verloren stukken/

Linnengoed op hot floor

- Welke indicatoren zouden belangrijk zijn om de kosten van beide ziekenhuizen te vergelijken?
    - Zouden deze in het resultaat aanwezig kunnen zijn van dienst?
        - Hygiëne
        - Gebruikerservaring
        - Nabestellingen
    - Zouden deze aanwezig kunnen zijn in het proces?
        - Unieke patienten
        - Pool
            - Aantal items/

            - Unieke items
        - Hergebruik
            - Gem levensduur pool
            - Afgekeurde stukken/
            - Verloren stukken/

Linnengoed op algemene ruimtes

- Welke indicatoren zouden belangrijk zijn om de kosten van beide ziekenhuizen te vergelijken?
    - Zouden deze in het resultaat aanwezig kunnen zijn van dienst?
        - Hygiëne
        - Gebruikerservaring
        - Nabestellingen
    - Zouden deze aanwezig kunnen zijn in het proces?
        - M2
        - Pool
            - Aantal items/
            - Unieke items
        - Hergebruik
            - Gem levensduur pool
            - Afgekeurde stukken
            - Verloren stukken

Afsluiting

- Heeft u nog vragen aan mij?

Bedankt voor het gesprek. Mag ik u contacteren als ik nog vragen heb. Zo ja, wat heeft uw voorkeur. Na afronding van mijn thesis kan ik deze aan u beschikbaar stellen. Als u, op een later moment, nog vragen heeft aan mij of uw opname wil verkrijgen, kan ik deze aan u doen toekomen