A study on the added value of Facility Management

I. Smit

Wageningen, January 2008

Information summary

Title: A study on the added value of Facility Management
Keywords: Facility Management, efficiency, effectiveness
Student: Irene Smit
Student no.: 840310776110
Supervisor: Prof. dr. ir. A.F.G.M van Wagenberg
Co-reader: Dr. W.J.J. Bijman
Faculty: Management, Economics and Consumer Studies
Specialization: Management Studies
Profile: Facility Management
Code: MST-80430

Abstract: This study focuses on the added value of facility management in an organization. The main goal is to identify the differences in added value, caused by the differences in organizing and structuring facility management. A literature review examines the available theories, knowledge and publications concerning structural and organizational factors which influence the characteristics of facility management. The review provides an input for the working hypotheses of this research. In the empirical phase of, a survey is conducted among organizations with at least 500 fte. The outcome of the survey is analyzed according the working hypotheses which contain the independent variables of this research. The working hypotheses include the independent variables which are analyzed quantitatively.

Acknowledgements

In front of you is the thesis report which contains the results of my graduation project. This graduation project was the last phase of my study Management, Economics and Consumer studies. Within the specialization Management studies, I have chosen the profile Facility Management.

The past period was very informative and educational for me. Because the scientific research domain was new for me, some parts went more successfully than others. In the end, I learned something of all experiences.

I would like to thank my two supervisors, Dries van Wagenberg and Jos Bijman, for their support and critical view on my project. Secondly, my appreciation goes out to the respondents of my survey, who were willing to fill in a questionnaire with a lot of tough and confidential questions. Last, but definitely not least, I would like to thank my friends and family who always supported me during this last phase of my study.

Irene Smit,
January 2008

Management summary

In 2005, the Vienna University of Technology in Austria conducted a big survey among the 300 biggest companies in Austria. The main goal was to compare the added value of organizations that have their own facility management department and organizations without a facility management department. The study indicated that organizations with their own facility management department tend to achieve higher added value than organizations without.

This was the main reason to conduct similar research in the Netherlands. Further, the focus in this research was on the differences in added value with respect to the way facility management is organized and structured in an organization. Until now, there were not many studies with respect to the differences in added value if the structure of facility management in an organization changes. Because 'added value' is a comprehensive subject, this research did focus on organizational structure and the organizational context.

The objective of this research was:

1) Gain insight in the effect of the introduction of facility management on the added value in relation with the facility management-structure. 1.1) Gain insight in the differences in effect that exist between profit and non-profit organizations.

The central research question was:
"What is the relationship between different ways of structuring Facility Management and the added value of organizations?"

The theoretical background for this study was focussed on the typologies of facility management, organizational structure and the differences between the sectors profit and not for profit.
There are many ways to typify a facility management organization. The NEN 2748 focuses on the different facility management functions, which make it easier to asses costs and to generalize between organizations. Becker (1990) has distinguishes three types, that have as main criteria the development process of facility management.
To make the term 'added value' measurable, different parameters are designed which will be the input for several 'working hypotheses'. The independent variables that expected to have an influence on the added value of an organization were coordination, organization and ICT. The fourth independent variable was 'sector' and focuses on the difference between the sectors profit and not for profit. Along with the theoretical background, four working hypotheses were stipulated:
1: Organizations who have completely outsourced their facility management functions will gain more effect on added value than organizations with (mostly) in-house facility management functions.

2: Organizations who have a strong coordination with the facility management department, will gain more added value than organizations with a weak coordination.
3: Organizations who introduced a FMIS and/or ERP gain more added value than organizations without an Information System.
4: Organizations in the profit sector gain more added value than organizations in the not for profit sector.
The hypotheses were, together with the questionnaire of Austria, the starting point for the questionnaire of this research. The population for this study consists of organizations above 500fte. The sample is randomly selected with help of 'the Chamber of Commerce' plus a database with governmental organizations. Because the outcome of the questionnaire was not normally distributed, the results were analysed by making a comparison between the independent variables (structure facility management) and the added value of an organization (parameters) with help of nonparametric testing.

The results showed no clear correlation between added value and the independent variable 'organization'. The results of the independent variable 'sector' showed that profit organizations score slightly higher on added value than not for profit. But the differences are not big enough to accept the working hypothesis. Further research is necessary to conclude anything.
The results showed that the independent variables 'Coordination' and 'ICT' have a correlation with the change in added value. However, because not all topics of the variable 'Coordination' showed a clear correlation, the working hypothesis cannot be accepted yet. Organizations with a Facility Management Information System (FMIS) scored higher on added value than organizations without a system. Because all topics showed a correlation and the test was significant, the working hypothesis can be accepted.

As a final conclusion, the central question is answered in brief. It is showed that there is a relation between the different ways of structuring facility management and the added value of organizations. The variables that especially showed al relation were the factors 'Coordination' and 'ICT'. The results with respect to the independent variables 'Organization' do not give a clear vision to assume a relation. The relation between the differences in profit and not for profit with respect to the added value of an organization is not showed really strong with this research.

Points for discussion are the length and structure of questionnaire, the comparison between Austria and the Netherlands and the chosen research strategy. It is recommended to repeat this research more extensive and to make a comparative study between the Netherlands and Austria and other countries in Europe.

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Part I: Conceptual design

The first part of this paper contains the design of the research. Research design provides the glue that holds the research project together. A design is used to structure the research, to show how all of the major parts of the research project work together to try to address the central research questions. The background of the research is treated, the objectives and research questions are designed and the methods to reach the objectives will be discussed. The design part is an essential part for the progress of the rest of the research(Verschuren and Doorewaard 2005).

1. Introduction

In this chapter the background information of this research is given. A start is made with the background of facility management. After that the project background is given. At the end of this chapter, a reader guide will treat the structure of the rest of this report.

1.1 Background and developments Facility Management

Facility management is a profession that developed a lot in history. When it started to become an independent profession, it was still an under-managed field of endeavour. However, as the discipline has developed, it was all about cost cutting, at least to an outsider. It became a leading objective and the chief distinguishing feature of facilities management in practice. It could have to do with the attraction of easy but incomplete indicators of efficiency rather than the necessarily more subtle and less direct measures of the effectiveness and the relevance of space use. The field of activity of a facility manager is widely developed since its existence. At first there was integration of construction and maintenance costs, which was called the cycle approach. Later were building and workspace considered integral. Building, furniture and equipment became 'housing' and 'workspace design'(Duffy 2000).

By now the link between workspace environment, housing and ICT is in most organizations not even a discussion anymore. Just by looking integrally and realize the new opportunities in areas like document management, knowledge management and telecommunication, offers this integration of the organization-infrastructure the organization new chances in facilitating core capacities and identity.

Because of the many developments in the past, FM operates on a huge competing marketplace with many FM-suppliers, FM-contractors, FM-consultants and in-house FM-teams(Kincaid 1994)

So in FM practice and education, there is a record of early success with much progress having been achieved in a short space of time. A secure basis has been established to support the next stages of development in FM. On the research front the position is rather different.

Over the past ten years there has been a significant shift towards outsourcing of facility and real estate services.

FM covers an extremely wide field of activities (Nutt, 1999), and is responsible for the provision of many varied services (Barrett, 1995). It has embraced broader range of services, more than building operations and maintenance (Aston, 1994; Best et al., 2003). The domain of FM has

been wider than the past. FM encompasses workplace, facility, support services, property, corporate real estate, and infrastructure. Today there are a variety of positions from where FM practice is conducted; those that give priority to property management, business support, customer and employee support, or to different combination of these (Nutt 2000).The function and role of FM are in turn wide.

Despite its rapid development in the last decade, the definition and scope of FM remains a contentious issue. An evaluation of definitions of FM provided in the past suggests that the focus of FM is clearly on the workplace. The key issues confronting FM Are the location, type, quantity, quality, to enhance the professionalism of FM, it is argued that there must first be consensus on the role and scope of FM in the industry and firm. Despite the considerable achievements of the last few years, the field of FM remains at a very early stage of development in which:

- It operates in an ever widening and ill-defined sphere of activity;
- The claims that it makes for itself are mainly untested;
- It has few secure methods of its own to underpin good practice experience;
- It is not yet supported by an adequate knowledge base;
- It has yet to make its own distinctive contribution to the management discipline;
- Its development to date has been unsupported by practical theory;
- it is grossly under-researched(Nutt 1999).

1.2 Definitions of facility management

Along with the developments and the increasing role of facility management, the profession is defined in many different ways.

Almost every definition underlines the aspect of an ‘integrating approach’; also a combination of people, processes, place and technology is highlighted. However, the importance of the relationship between the supporting the primary process is not always distinguished in every definition.

Some of them founded in the literature are:

> *“A profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology*. (International Facility Management Association)”

"Facility management is responsible for coordinating all efforts related to planning, designing, and managing buildings and their systems, equipment, and furniture to enhance the organizations ability to compete successfully in a rapidly changing world."(F. Becker)

Facility management in its widest and truest sense concerns itself not merely with the management of premises, but with the services, people and facilities those buildings contain. It is a concern that runs from the initial design of the buildings to day-to-day maintenance, and has as its constant aim the use of manpower, energy and related resources as intelligently and cost effectively as possible. (British Association for Facility Managers)

Facilities Management: An integrated approach to maintaining, improving and adapting the buildings of an organization in order to create an environment that strongly supports the primary objectives of that organization. (P. Barret)

A definition of facility management accepted by the Nederlands Normalisatie Instituut (Dutch Standards Institution) in NEN 2748 is:

Integration of processes within an organization to maintain and develop the agreed services which support and improve the effectiveness of its primary process.

Like the definition of the NEN 2748 underlines, facility management is a function that is for the promotion of success of the core process of an organization. When the FM profession just came up, that was not immediate the case. However, along the many developments, it became a general management function as a crucial part of the organization.

The definition that is important in this research is the one that is accepted by the NEN. The reason for that is that the success and effectiveness of the core process of the organization is underlined here. It also emphasizes the integration of processes. In this research the focus is on the added value of the organization that is caused by the introduction of facility management. In this research it of high importance to elaborate on what is facility management and what is not. In the definition of the NEN 2748 is clearly defined what is facility management. It's about the management of processes of facility functions in an integrating way. Therefore it can be concluded that Facility management IS NOT: only the attendance of facility functions within an organization that are managed individually by an existing department. The important criterion of facility management is the integration of the processes of the facility functions which are management by separate facility management department.

1.2 Project Background

"Almost all executives report that facility management makes a positive impact on their organization's productivity and financial bottom-line. However, six in ten think of their facilities as a cost of doing business or a resource that enables the organization to function.
Seven in ten executives say facility management is a recognized profession, but many feel that it is not appreciated except in times of trouble."(www.ifma.org, Views From the Top...Executives Evaluate the Facility Management Function, 2005)

Facility Management is becoming an essential tool for more and more organizations. It becomes an important strategy for cost reduction and the success of an organization. There are many publications and books that underline that fact. The measurement of performance is one of the most prominent features of modern life extending
as it does through politics, economics, business, education and sports. From the money supply to the golf score, measurements play a key role in determining our actions and influencing our behaviour. Much time can be wasted in measuring the inconsequential, but when the right measure is taken and compared with results from elsewhere the influences can be powerful indeed, particularly when differences are marked (Kincaid 1994).

Traditionally measures of real estate performance are primarily financially based. With these measures some indication of financial performance and savings after introducing FM is given, but other aspects that help to demonstrate added value are left out(Redlein, Schauerhuber et al. 2005).
This was the mean reason for IFM of the Vienna University of Technology in cooperation with FHS Kufstein Tirol to create a big Facility Management Survey in 2005. Their population was the 300 biggest companies in Austria. More than 100 companies from various sectors participated in the survey. The survey consisted of a standardized questionnaire 'The facility inquire' with open and closed questions. The questions were focussed on three main areas: a general part, a part about FM organization including service provision (IT) and a part about benefits and savings within FM. The most important comparison they made was between organizations with an own FM-department and organizations without. The general conclusion of the study was that organizations with an own FM-department tend to have higher savings, than organizations without (Redlein, Schauerhuber et al. 2005).

The above mentioned project formed an important input for this research in the Netherlands. In this way, the outcome can be compared with that in Austria. With the above mentioned general conclusion of the research in Austria as starting point, this research focuses more on added value with respect to the structure of facility management as a management model instead of focussing on the differences between organizations with FM versus organizations without FM. With the current developments and trends in facility management, organization need to make more and more complex decisions when it comes to the structure of facility management in their organization. The rise of information tools like facility management information systems and enterprise resource planning, different trends in organizing facility management and the coordination of facility management with respect to the main organization, are all factors that influence these decisions. To see if there is a relationship, and if yes, what kind of relationship between the way facility management is structured and the degree of added value, this research is conducted. Next to that, the relationship between the added value of profit vs. not for profit organizations and added value is studied. Expected is that facility management in not for profit

organizations are less developed than in profit organizations and gain therefore less added value, but isn't studied in particular.

1.3 Conclusion an motives research

Facility management is an essential tool for organizations these days. In the last decade, there has been a dramatic growth in Facility Management activities worldwide, resulting in a wide and diverse marketplace for Facility Management suppliers, facility management consultants, in-house facility management organizations and outsourced FM organizations. Facility Management is still developing. Factors that had and still have a lot of influence on the development are the increasing developments and role of ICT in organizations and the shift to a more customer focused organization. Driven by different organizational criteria, organizations have built up different approaches when it comes to their facility management. This will have an influence on the facility management structure and in the end the added value of an organization. By now, like is experienced in many organizations these days, a FM department is recognized as a successful tool of an organization. However, research about the characteristics of that FM-department is still scarce. How does a FM-department have an influence on the added value of an organization? Are there specific characteristics that influence the success of a FM department?
These aspects need to be clarified to say more about the added value of facility management. It is expected that (with this information), it becomes more easy for organizations to adjust their FM-department in their organization more successfully. Therefore, the biggest problem is the lack of indication of the specific effect of facility management on the added value of an organization.

Besides the research in Austria, the main motive to conduct this research is to specify the independent variables of facility management that will have an influence on the added value of an organization.

1.4 Reader guide

This paper consists out of four parts.

Part I Conceptual research design.

In this part consists out of two chapters. In this first chapter an introduction to the problem is given, where background information was provided and the motivation for this research was explained. Chapter 2 goes on with the research domain, where the research questions come by and the research strategy is explained.

Part II Theoretical Background.

In this part a theoretical background is given, that will function as a foundation for the rest of the (empirical) research. The part is build up out of three chapters. Chapter 3 is focussed on the typologies of facility management, chapter 4 focuses on the dependent and independent variables of this research and chapter 5 is a concluding chapter with the conceptual model in the end. The information found in the literature will be translated to this research.

Part III Results.

The results of the empirical part will be the input of this chapter. First, a justification of the used methods is given in chapter 6. After that, the results will be discussed in chapter 7.

Part IV Conclusions and discussion.

The final part of the research will represent the final conclusions of this research in chapter 8. In chapter 9, the outcome of the research will be discussed and, if necessary, recommendations for further research are given.

2. Research domain

In this chapter the research objective and research questions are formulated. The methods which are chosen to use during the theoretical as well as the empirical part are motivated and are classified into different steps in the research framework.

2.1 Research objective and central question

The definite research objective of this research is:

1) Gain insight in the effect of the introduction of facility management on the added value in relation with the facility management-structure. 1.1) Gain insight in the differences in effect that exist between profit and non-profit organizations.

The research of Austria studied the differences in added value with Facility Management and without facility management is investigated. With the current developments in facility management as a background, it is now important to investigate the aspect of added value in more detail. Which factors have an influence on the differences in added value with respect to the structure of facility management. Besides the organizational structure, this research focuses on the context of an organization. That is why gaining insight in the differences between profit and not for profit organizations is formulated as a sub goal.

The central question of this research is:

"What is the relationship between different ways of structuring Facility Management and the added value of organizations?"

To come to a satisfying answer, the central question is split up in several sub questions.

The sub questions are:

1. How can the added value of an organization be measured?
2. How can organizations be distinguished into different types, with respect to the way their facility management is organized?
3. How can the facility management structure be measured?
4. What are the most important differences that can be found in organizational structure of facility management?
5. What differences in effect on the added value of an organization can be found between profit and not for profit organizations caused by the introduction of Facility Management?
6. What is the effect of the results of this research on the current FM typology?

The first three sub questions will be answered during the theoretical part, the last three during the empirical part. The literature that will be studied to be able to answer the first three sub questions is explained in the next paragraph.

2.2 Research framework

A research framework gives a graphical view of the important topics of a research. Figure 1 represents the framework of this research. The research framework exists out of four parts with the consecutive steps to take, in the course of the research project. The first part represents the different topics of interest in the theoretical part of this research. The second part is the pre-empirical stage where, with help of the theoretical background, working hypotheses are formulated and the database for the survey is made ready for use. The working hypotheses are formulated with the independent variables found in the literature. The third part, the empirical part, exists of the conduction of the survey. In the last part, the analysis part, the results will be analyzed. After that, conclusions and discussion can be written. The four parts of this framework are described more into detail in the next paragraph, were the methods and techniques that will be used during this research are explained.

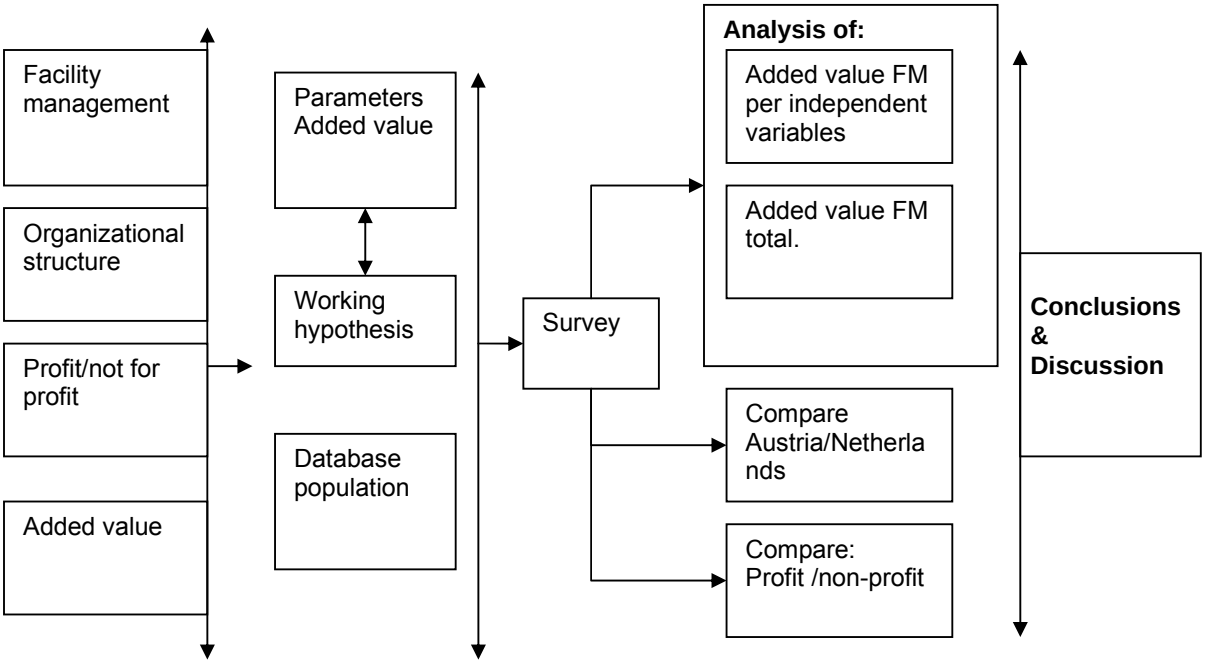

Figure 1: Research Framework

2.3 Methods and techniques

In this paragraph are the methods and techniques describes which are used in this research. Besides the research strategy, some definitions which are important for this research are defined.

2.3.1 Research strategy

To be able to create a satisfying answer to the research questions it is essential to use the right strategies in all phases of the research. The strategies which are used are described below.

- Quantitative and qualitative research

With quantitative research the data which is collected are information about the world in numerical form, whereas qualitative data are information about the world in form of words(Punch 2005). The motivation for choosing quantitative research is that it provides a broader view, which makes it easier to build on in the future.

1. Theoretical part: Desk Research

Desk research is recognised by three characterizations:

- Use of existing material
- There is no direct contact with the research object
- Use of material from another point of view than it was produced(Verschuren and Doorewaard 2005). For the theoretical part, desk research is necessary in four different areas. First, the literature about facility management is treated. Especially the different typologies that exist in the literature are treated, that is necessary to see whether or not it is possible to create an additional typology of facility management. Secondly, the literature of organizational structure is studied. This will be necessary to find out the important factors for structuring facility management in an organization. To make the term added value measurable, parameters needs to be created. These parameters will be based on the answer that is given on sub-question 1 (paragraph 1.2.1). Finally, the literature about the aspect profit and not for profit are studied, especially the different characteristics. All the four areas will be the input for the conceptual framework which is created at the end of the theoretical part.

2. Empirical part: Survey

The survey exists of a questionnaire that will be based on the questionnaire from Austria.
A survey is a strategy which goes more into ‘breadth’. To be able to test the outcome of the data quantitatively a large amount of research units needs to be reached. Expected is that organizations with at least 500 fte are big enough to be familiar with the term facility management. The organizations for the sample are selected out of a database (more about this in chapter 4).The questionnaire is carried out with help of the internet. The questionnaire will be published on a personal website and the link will be sent by e-mail to the selected sample.

3. Pre-empirical part: database and working hypothesis

This data is analysed with the help of working hypothesis. Working hypotheses, because they are less heavy than general hypothesis but more specific than basic assumptions. This research will be in the position where it is ahead on exploratory research, but expected not to be ready for theory testing. The working hypotheses will be formulated as a result from the theoretical part and

will be formulated based on the important factors found. The hypotheses that will be formulated represent each one dependent variable that makes it possible to measure the degree in added value (independent variable).

4. Analytical part: analysing results

The important results with respect to the working hypothesis are given. The conclusions will also be structured by the working hypothesis, but also be focussed on answering the sub questions and in the end the central question.

2.3.2 Definitions

There are some terms in this research which need to be defined especially.

Added value: refers to the increase in worth of a product or service as a result of a particular activity.

Efficiency: the degree to which a system or component performs its designated functions with minimum consumption of resources

Effectiveness: the capability of, or success in, achieving a given goal. Contrary to efficiency, the focus of effectiveness is the achievement as such, not the resources spent, so not anything that is effective has to be efficient, but anything that is efficient also has to be effective.(wikipedia.org).

ERP: ERP stands for Enterprise Resource Planning. The main goal of an ERP is to maximize productivity of organizations, to control costs, and to satisfy the customers' wishes. ERP realize this by automate completion of logistic, administrative and financial company-processes. This integrated automation solution is known by the term ERP software, ERP package or ERP software.

FMIS: a facility management information system is an integrated man-machine system with which information is provided concerning the orders and available facilities which serve for the support of the operational activities, the management, the analysis and decision-making functions within a facility organisation.

Part II Theoretical Background

For this research, it is necessary to provide a good stable theoretical framework that will form the basis for the empirical part of the research. For some of the sub questions, the theoretical framework need to function as (a part of) an answer to go deeper in the research. This part is structured as follows:

- First the main literature about facility management is studied on typology. With the background information on facility management from the past chapter, it is now essential to go deeper in on the role of facility management and on the typology that is used to distinguish different types of facility management
- After that, the focus is on the parameters of added value. To make the term added value operational and measurable, different parameters need to be created. The parameters will function as the measurement-tool for added value in an organization. Besides creating parameters, independent variables of organizational structure are described that expected to influence the added value of an organization. Finally, literature is studied that will explain the differences between profit and not for profit organization
- At the end of this theoretical part a conceptual model is given, which includes the working hypotheses, which will be created with help of the founded literature and will be analyzed during the empirical research. The relation between the dependent and independent variables is given in the model.

3. Typologies in facility management

Having given definitions and background information about facility management in the first chapter, the following chapter contains a more detailed description about the literature of facility management from different points of view.
In this chapter the following sub-question is answered:

How can organizations be distinguished into different types, with respect to the way their facility management is organised?

3.1 The role of facility management.

Facility management is been adapted more within organizations. It has become a part of their governance structure, because the primary function is to support the core process and meet the needs of an organization and its employees.
FM is a key function in managing facility resources, support services and working environment to support the core business of the organisation in both the long- and short-term. However, the nature and characteristic of organisations are likely to vary too. Some organisations may focus very much on business strategic issues. While other organisations may only emphasise on their operational process and short-term outputs. The organizational objectives normally vary by different business environment (Lee, 2002). Different organisations are differently reliant on their facilities and support services, and affected by environment and context. In turn, facilities as well as FM function are prioritised differently to the core businesses of different organisations. Consequently, the function, role, scope and priority of FM function need to design to fit with these contingent matters. Fitting FM function to a particular nature and demand of the organisation, which is effected by surrounding environment, is crucial. Atkin and Brooks (2000) stress that, understanding the organizational needs is the key to effective FM, measured in terms of providing value for money.
With the precise understanding, FM can link to the core business by providing services that fit and respond to the actual characteristics, needs and constraints of a particular organisation, and organisation's changes effectively(Barret and Baldry 2003).

3.2 Facility management trends and types

The main reason for make use of typology is to understand, define, analyze and verify the items, samples, and data. A typology is not identical to a classification, but shows a lot of similar characteristics. Bailey(1994) defines classification as the ordering of entities into groups of classes on the basis of their similarity. He states that without classification, there could be no advanced conceptualization, reasoning, data analysis. In the literature there is not a clear and consistent classification. There is a lot written about important developments, trends and new concepts in Facility Management in the past years.
Becker (1990) and Davis et al. (1985); Price (2004) and Brochner (2000); and Williams (1996) and Varcoe (2000) have introduced three different ways of typology. Becker and Davis classified

18 context organization according to the nature of change (low change/high change) and the nature of work (routine/non-routine). It was concluded that FM operates differently in different contexts because of the attempt to fit into the organizational structure(Duffy 2000).

The ORBIT research of Becker (1990) formed the input of the following three types of Facility Management to distinguish.

- Loose fit: a FM function that is split-up and operationally working focussed on production. It depends on the organization and its developments and works with a budget. There is no central supervision in a loose fit organization. Within a small facility management organization there is no direct staff member that is responsible for that. Loose-fit matches the best with organizations who live in a period of growth and who will mainly focus on the demand of the market. They do not pay attention to formal rules and regulations. Also for large stable organizations with a standard organization that do not change daily, a loose-fit organization suits. Changes are not necessary and do not occur a lot.
- Tight fit: a formal staff function that is mainly focussed on reducing costs. The facility manager is criticized on the way he performs on that aspect.
  The facility manager is not a popular person in the organization because of strict regulations that were not there before the introduction of facility management. A higher efficiency is expected in this type of organization because of the reduction in costs, but the effectiveness is expected to decrease because the chance on dissatisfied employees is bigger. A tight fit organization can play a big part when an organization is in a transition phase to come to the next phase. Tight fit offers a standardized package that exists of only a few facilities. Tight fit organises a lot of information and participates in projects that are organized on directive order.
- Elastic fit: In an elastic fit organization are the expectations and the needs of the internal customer the most important. The customer gets the opportunity to make more choices that the facility management organization offers to him. The regulations are most of the time central, but elastic fit is flexible in possibilities to make decentralized decisions. The organization is situated in a rapidly changing environment and has the ability to adjust to each situation.
  Elastic fit makes a clear separation between the primer process, the FM function and the production of FM supplements. The main goal here is to work on a more effective facility management organization and to increase the efficiency of the production process in general(Becker 1990).

The importance of NEN 2748, a Dutch Standard for Terms for facilities - Classification and definition, is that terms for facility services get standardized and categorized. The primary function of the NEN 2748 was to make a standard classification, so an organization can investigate the costs of its building(s). The classification of the facility services are based on the costs of the activities that are necessary for the existence of the services. Within this research the NEN 2748

is an important topic, because it focuses on the standardization of facility management functions which make it easier to classify different types of facility management. Consequently, for the first time, the scope of the domain Facility Management itself has been unambiguously named, just like FM's specific nature: management of the entirety of these facilities(Nederlands-Normalisatieinstituut 2007).

Facilities of NEN 2748 are grouped according to function:

- **Housing** contains facility functions like rent, maintenance and renovation of real estate. The housing category contains a theoretical as well as a pragmatic background. The chosen construction has many similarities with divers classifications of housing costs which are used for a longer period.
- **Internal services and means**: This category contains a broad frame of facility functions. It contains the 'consumer services' like catering, workspace management and the company restaurant. But also the management of documents and risk control (safety & supervision). With risk control, only the main research with respect to the total risks in organizations is meant.
- **Information and communication technology**: In this category all ICT services e.g. infrastructure transmission, hardware, software and support are concerned. This category is an essential part of the management of an organization. A flexible categorization is necessary because developments with respect to ICT go very fast.
- **External services**: This is a separate category because costs of external services can be very substantial and are dependent on the primary process of an organization. Examples of services from this category are: stay in external conference accommodation, workplaces at home, business trips, leased cars and other company transport)
- **Facility management**: This category contains the integral management of the aforementioned categories, a/o in the field of environment and health & safety at work, plus quality and purchase aspects.
  The most important function of this category is to further professionalize the facility management functions. The developing of a professional status is a long-term process. It contains the activities, mainly on strategic level, that concern the facility activities independently. Facility policy is one important area that is part of this category. But also 'Quality Management' and 'Risk Management' are examples of facility activities which concern all facility functions individually and are managed by this category integrally.

The last category underlines best the concept facility management. Without having any activities in this category, there is no integral management aspect and therefore no 'Facility Management' you can distinguish(Nederlands-Normalisatieinstituut 2007).

3.3 Conclusion

The function of this paragraph was to give an answer to the question:
How can organizations be distinguished into different types, with respect to the way their facility management is organised?

There are many ways to distinguish a facility management organization. In the literature authors argue about the trends in facility management and the developments which make it possible to diversify FM organizations. The way facility management is distinguished into different types is mainly based on the focus of the organization or the way the facility services are organized.
In this chapter two approaches with respect to the typology are discussed. The first theory of Becker (1990) distinguishes a facility management organization into ‘loose fit’, ‘tight fit’ and ‘elastic fit’ and focuses on the ‘nature of work’ and the ‘nature of change’. The second way to group facility services is by function according to the NEN 2748. The theory of Becker (1990) distinguishes clearly three types of facility management. The NEN 2748 does not make that distinction. It is a guideline to group facility services and their costs by function. A ‘facility policy’ grouped under the section ‘Facility Management’ is at least provided to practice facility management within an organization. There most be some integral policy to manage all facility services together. The presence of facility services in an organization only, is not enough to call it facility management. In some organizations facility services are managed by other departments individually.
The goal of this research is to get a better view of the characteristics of facility management with respect to the added value. This may be of influence on the way facility management can be typified in the future.

4. Adding value: parameters and independent variables

In the previous chapter the first part of the input is given for the conceptual model. Different typologies of Facility Management are discussed. In this chapter the term 'added value' is treated more into detail. In the first paragraph, the term added value is made operational into measurable parameters; they will function as a measurement-tool for added value in the rest of this research. In paragraphs 4.2 till 4.4, literature about factors of organizational structure is treated. In paragraph 5, the literature about profit and not for profit organizations is discussed. The outcome of the paragraphs 2 till 5 will be the input for the independent variables that influence the added value of an organization.

4.1 Parameters added value.

The sub question that will be answered with this paragraph is:

How can the added value of an organization be measured?

Added value of an organization is a lot used concept and measured in many different ways. There is a lot said in the literature about added value, in a very complex and divers way. Because the intention is to keep the research in the same format, it is logical to keep most of the questions of the questionnaire of Austria. The researchers in Austria measured the added value in terms of efficiency and effectiveness.
The efficiency and effectiveness of an organization is a complex and large subject. There are a lot of theories who treat this subject and a lot of interpretations used. In this research it is not necessary to fully examine all of them to be able to come to a conclusion. In this case the following definitions are used:

> Efficiency: the degree to which a system or component performs its designated functions with minimum consumption of resources
>
> Effectiveness: the capability of, or success in, achieving a given goal. Contrary to efficiency, the focus of effectiveness is the on achievement as such, not the resources spent, so not anything that is effective has to be efficient, but anything that is efficient also has to be effective.

The measurement of the degree of efficiency and effectiveness was done by formulating questions of the increase of that since the introduction of facility management on the following parameters:

- Advantages and savings on several aspects (see Appendix 1, question 23)
- Increase of productivity on several aspects (see Appendix 1, question 24)
- One time savings
- Yearly savings
- Perceived success facility management

In this research, the same interpretation of added value is used. This will make it easier to compare both studies later on.
For this research it can be concluded that added value can be measured and interpreted in many ways. To be able to compare the results between Austria and the Netherlands as good as possible later on, the same parameters are used for measuring added value like described above(Redlein, Schauerhuber et al. 2005).

In the following paragraphs, factors that have an influence on an organizational structure are described. The characteristics are translated to the organizational structure of the facility management part of an organization.
With that, an answer on the following sub-question will be given:

How can the facility management structure be measured?

4.2 Position: Integration and coordination

A manager of an organization has the intention to adjust the structure of an organization to his employees and resources in a way that goals can be reached. Thereby the goals of external and internal stakeholders can be realized. The creation of a framework for reaching the goals of is called the structuring problem(Keuning and Eppink 2004).
Integration is a part of the structuring problem in organizations. Integration can be approached from an economic or a management point of view. From an economic point of view, integration is used as a tool to get and maintain a certain way of control. With a management point of view, integration is used for adjusting the structure of an organization to its goals. In this research the concentration lies with the management point of view. The following definition is used for integration. The definition is build with help of existing definitions that exist in the literature (like Lawrence and Lorch (1986), Keuning & Eppink (2004)) and is adjusted to one definition which will be used for this research. In this research integration will be defined as follows:

> *"Integration is the act of combining or coordinating several parts or elements of an organization, who have to act interdependently as a benefit for the organizational process (es), into an entire whole."*

From a management point of view, integration and coordination are synonyms from each other. In this research it is not of importance elaborate on the differences, because they are very small. Both terms will be used as synonyms from each other.
Coordination is a process aimed at managing dependencies (Keuning and Eppink 2004). Within a traditional organization, the hierarchy is the backbone of coordination, but additional coordination mechanisms are standardization of work practices and mutual adjustment. Mutual adjustment, also called horizontal integration, involves structural arrangements and process integration, but in the end it is based on mutual understanding (Mintzberg 1979).

Mintzberg (1979, 1989) has synthesized the organizational literature on the structure of organizations. He has developed a typology of organizational configurations, where he distinguishes six types of co-ordination mechanisms:

- Mutual adjustment, which achieves coordination by the simple process of informal communication.
- Direct supervision: coordination is achieved by having one person issue orders or instructions to several others whose work interrelates.
- Standardization of work processes, which achieves coordination by specifying the activities of different tasks.
- Standardization of outputs, which achieves coordination by specifying the results of different work.
- Standardization of skills, in which different work is coordinated by virtue of the related training the workers have received.
- Standardization of norms, in which it is the norms determining the work, usually for the entire organization. Everyone functions according to the same set of beliefs.

Mintzberg argues: when organizational work becomes more complicated, a shift is seen from mutual adjustment to standardization, preferably of work processes(Douma and Schreuder 2002).

4.1.1 Interdependencies

The need for coordination arises from the existence of interdependencies. If there is no interdependence, there is nothing to coordinate. Coordination is not only focused on 'making things fit'. The problem of coordination is worsened by several factors, like the information asymmetry that usually exists between the actors.

The main aspect of the coordination problem is the (inter)dependency of (a part of) the activities of an organization. The integration of activities and services is efficient when there is a high degree of interdependency present. Also Thompson (1967) ties coordination to interdependency. There are three different types of interdependencies to distinguish: pooled, serial and reciprocal interdependency.

When interdependency between activities is indirect, a pooled interdependency exists.

Serial interdependency occurs when one department is dependent on another departments output. They are sequential to each other. The output of one department is the input of another department. When one department stays behind, the other department is effected and can not go on.

Reciprocal interdependency occurs when there is a direct link between different departments of an organization. The output of every part forms the input of every other part of an organization.

Thompson's work proposed that pooled interdependence was coordinated through standardization, sequential interdependence through planning and reciprocal coordination through mutual adjustment. Mutual adjustment is usually associated with horizontal coordination and is said to be realized through a "simple and informal" communication process.

Galbraith (1973, 1977) sees coordination as the main issue in organizational design. He even states that the organizational design is the search for coherence between the goals or purposes for which an organization exists, the people that do the work and the patterns of division of labor and interunit coordination. To be sure of a stable organizational structure, it is essential to have a strong coordination between all activities of the organization.

With the growth of e-commerce and the trend toward increasing globalization of operations and outsourcing of functions to external service providers, there is an emerging need to integrate and automate processes that span organizational boundaries.

When the structuring problem exists, an organization tries to divide the overall problem into subtasks and divides the different parts to individuals. Organizations undertake a division of labor, because individuals have limited information-processing abilities (Simon, 1962; March & Simon, 1958). Eventually, an organization has to re-integrate its tasks that it originally divided to reach the overall goal of the organization. Thus, the flip-side of division of labor is integration. When tasks become more complicated and are divided among specialists, the problem gets even more complicated. Specialization reduces the bounded rationality of an organization, because individuals can concentrate on tasks their specialized in and that meets their unique skills and abilities. However, the integration part of the organization becomes more complicated, because different specialists speak different languages and perceive the world in a different way(Health and Staudenmayer 2000).

4.1.2 Value chain analysis

There is a lot written in the literature about the efficiency of an organization. One of the theories that focus on that subject is the value chain analysis of Michael Porter (see figure 2). Because Porter explains the efficiency of an organization by using a clear distinction between the primary and support activities, this paragraph is used to explain more about how efficiency can be measured.

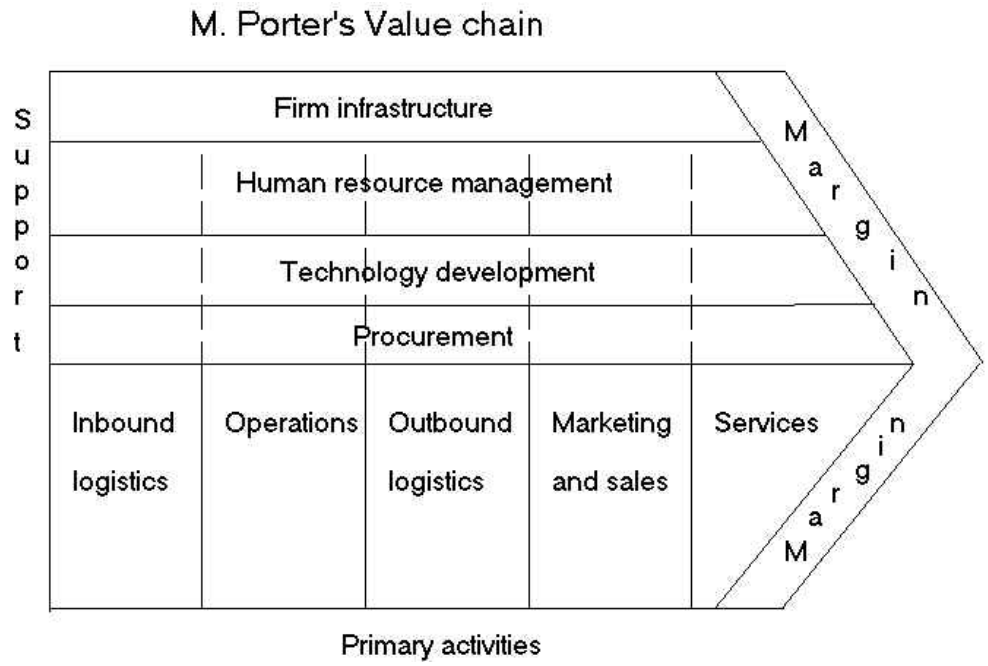

Figure 2: Porter's Value Chain

The value chain developed by Michael Porter (1985) is a process-oriented model.
Porter identified the value chain as a means of analysing an organisation's strategically relevant activities in order to understand the behaviour of costs. Competitive advantage comes from carrying out those activities in a more efficient way than ones competitors. Porter distinguishes clearly the primary activities of an organization from the support activities(Porter 1998).

The primary activities are divided into five activities, but are not isolated from each other. The support activities function as a 'backbone' of the primary process of an organization. The different activities need to interact with each other and need to be seen in a wider context. They are not independent blocks, but the linkages between the activities will affect the firm's cost performance and its competitive advantage.
The arrow shaped figure underlines the sequential nature of the primary activities and its process-focus. To increase the efficiency of the firm, it will be necessary to make the support activities fit with the primary activities. Therefore, all activities will interact with each other and will function as a value adding system for the organization. To provide a stable 'backbone' for the primary part of a firm, it is necessary that the support activities are coordinated with each other, and not function

as a independent activity(Porter 1998). Facility Management is clearly a part of the support activities in this model. (Kincaid 1994) states in his paper that facility management belongs to the managing infrastructure of organizations. Therefore, in the value chain it belongs to the activity-part 'firm infrastructure'. To make the facilities sequential with each other an integrated management approach is necessary. Facility management must be linked strategically, tactically and operationally to other support activities to add value to an organization.
The integration of facility management is a horizontal form of coordination. When it is possible to integrate all facilities, it is possible to organize in a process-oriented way instead of a functional way. Employees will work more process-focused instead of task-focused, which will create multitasking. Integrated, process-focused functions will have activities on a high service level and are planned more easily. Therefore, they could be simple combined with each other(Kincaid 1994).

4.1.3 Hierarchal position: The power of decision making

With the aspects of the structuring problem mentioned above, the most important decision to make is where to concentrate the power of decision making; centralization/decentralization. With the centralization/decentralization issue, the most important aspect is where the power of decision making rests.
The facility management organization can be organized in several ways. (Ytsma 2002) describes six different organization developments, which influenced the organization of the power of decision making strongly:

- Differential service: a model that was introduced in the seventies and was strongly focused on execution of tasks.
- Integral service: this model was especially popular in the late seventies and early eighties. Mutual relations between services were accepted and specializations were introduced.
- Facility department: this model was introduced in the late eighties/early nineties. Facility services were accommodated more in one department.
- Facility unit: this model came up at the beginning of the 21 century. The most important goal was to focus on the added value of the core process.
- Facility operations: this model focuses on the specialization of several facilities by specialists
- Facility company (main contracting): here the total package of facility services is managed by an external supplier.

In line with the different organizational forms, the power of decision making changes also. There has been a shift from a bureaucratic centralized structure (like differential service), to a more decentralized structure when it comes to the power of decision making (Velthoven in Ytsma, 2002). This is one of the reasons why the accent for the position of facility management in the organization shifts from a staff function to a line function. Another reason is the increasing amount of money that is needed for workplace design and the awareness of the role of facility management on the productivity of the organization(Wagenberg 2000). Because the power of

decision making is always dependent on the organization form, it is hard to say what would be the most efficient position: centralized or decentralized. But with the shift in organizational forms from a differential service to facility unit or even a facility company (Velthoven in Ytsma, 2002), a decentralized structure is more efficient than a centralized structure. With respect to that, a certain professionalization of the facility management function is created. When a facility management function is becomes more professional, the focus on efficiency and costs also increase. The facility management organization develops then to a service organization. Besides the decentralization of budget responsibilities, the communication with the customer of FM and the service level agreements with that customer are important criteria. With the increasing role of ICT (discussed in paragraph 4.3.), it's becomes easier to control a decentralized facility management organization (Walters in Ytsma, 2002).
The hierarchal position and coordination of the facility management organization influence the decision of the organizational control of facility management. There are several ways to organize facility management functions. They can be organized in-house or outsourced. Outsourcing can further sub-divided into different formulas, the important formulas will be discussed in the next paragraph.

4.2 Organization: outsourcing

Organizational control includes a large area of different formulas within an organisation. It contains in-house, outsource and collaborate (facility sharing). Because the market has become bigger and more professional, the opportunities increase. New opportunities increase also because of the development of ICT. Sourcing takes a lot of time and consideration. Even for services that are outsourced most of the time is it important to consider all advantages and disadvantages completely. Why do organizations decide to outsource their products and services? Sometimes organizations get along with a hype at a certain moment of time. The don't see the benefits clearly for their organization, but are afraid to stay behind. That is why, when it comes to sourcing, arguments for in-house/outsource of collaboration are formulated precisely and are evaluated periodically.

According to Maas and Pleunis (2006) the following forms of outsourcing can be identified:

- Direction: Direction is to perform activities which have not yet been specified according to nature and seize, by the client.
- Partial outsourcing: Partial outsourcing is to split the to be outsourced activities in several parts.
- Integrated outsourcing: That the whole of the performance of an activity is in the hands of a supplier/executer of the activity.
- Capacity outsourcing: outsourcing with the fine-tuning to the necessary capacity on the demands of facility products/ services with the help from thirds parties.
- Co-maker ship: a part of the service(s) is outsourced to third parties on a long-term basis. The outsourcing is more than capacity but has also references to quality and (product) innovation. It is an equal relation between partners.

- Main contracting: main contracting is a name for a collective set of contract forms. In these contracts a significant amount and diversification of facility products and services are put on an integral way in one contract. Where the person offering the contract bears the risk of obtaining the result. Within main contracting there are three forms:
- Multi-service supplier: A multi-service supplier is a facility supplier who offers a diversity of facility services and can bear the risk for delivery of different products/services on operational and tactical levels based on specification of the client. The multi-service supplier is more focused on operational side of facility management. Core competences are knowledge of the operational process of facility management.
- Facility broker: A facility broker is an integral facility supplier who can bear risks of facility processes on an operational and (partly) tactical level, which he purchased and coordinated based on specification of the client. The core competence of this purchasing partner is the strategic and tactical purchases.
- Integrated Facility Management[1] An integral facility supplier who performs the facility processes for the client on partly strategic and tactical level. And can be risk bearing for the effectively and efficiency of the delivered services.

4.2.1 Integrated Facility Management

With Integrated Facility Management (IFM) the whole implementation of facility management, including the design, is outsourced to the supplier of the activities (the integrator). The principal makes clear what his quality design is and what his demands are. After that he is as minimal as possible involved with the assignment. Outsourcing in an integrated way is a complex process and needs a lot of planning and designing ahead. A graphic overview of IFM is showed in figure 3. In the Netherlands there are 20 players in the area of IFM (Maas and Pleunis 2006).
IFM has advantages and disadvantages. The most important advantages are (Maas and Pleunis 2006):

- Professionalizing of demand market
- High outsourcing degree with operational activities, which causes a small step away from IFM
- Durable savings
- International attention for and experiences with IFM
- Attention for public private cooperation

The most important disadvantages are:

- Disappearance of knowledge of FM
- The fear of losing 'grip'
- Few known successful cases
- Not enough experience with outsourcing-model as cooperation form
- Facility and primary process mix with each other

[1] Sometimes called 'Total Facility Management'

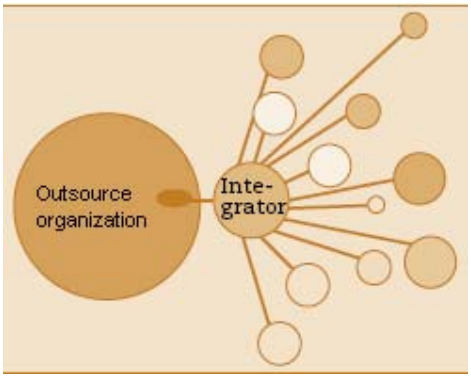

Figure 3: Integrated Facility Management organization

Performance

From a strategic management perspective, facility management can be seen as a long-term non-core process of planning and relating facilities to organizational development. In order to be able to compete in the changing business environment, organizations are focusing on cost reductions and outsourcing of non-core activities, thus gaining a competitive advantage. This implies an idea for outsourcing decision based on the performance measurement of the in-house FM department or FM main contractor organization. This performance-based approach to facility management considers several tools for measuring the quality of FM operations. No matter what is the degree of outsourcing arrangement, FM team should always serve as a balancing element between the management, users, and service providers(Connors 2003).

4.2.2 Supply models of FM services

The demand market is more and more changing towards wider service packages deeper know-how, and closer buyer-supplier relationships. The marketplace has been restructures through the number of mergers, acquisitions and alliances. As a consequence, on the one hand, total FM concepts and horizontal co-operation between different service providers are becoming more popular, and on the other hand, companies focusing on only certain area of service provision, such as property management, have been established (Atkin and Brooks, 2000). FM services are mostly intangible services, even though there is some degree of materials included in some areas of service provision.

FM services are most of the time simple, and like mentioned earlier, they are represented as non-core support activities of the organization. The benefits of outsourcing are mainly due the economies of scale (Krumm, et al, 1998).

Having other enterprises specialist in the production and provision of supporting goods and services allows the host organization to concentrate on those activities in which it can establish distinctive `core competence' (Hamel and Prahalad, 1994). Focusing on core competence and leveraging against other sourced relationships allows for achieving economies of scale, thus

producing goods and services more efficiently while improving quality through the application of specialist knowledge(Kakabadse 2000).
According to a Finish research, a transition these days take place towards closer relationships and bigger purchase entities is taking place in the FM service market to compete more efficiently (Lehtonen and Salonen 2006).
This is also why players in the FM market are more ahead in using supply models like integrated service provider model (in which services are offered in large entities) as opposed to using supply models like the specialized service provider model(in which a company only focuses on one or two types of services). When services are bundled by one service provider and the range of services are further developed, it is not only possible to respond reactively to a client expressed needs. Because of the competing conditions, service providers tend to be more proactively involved with the development of the range and quality of services. Therefore it is necessary to have a more active role in creating service packages that satisfy the needs of the clients(Lehtonen and Salonen 2006).

4.3 ICT: information systems

Information systems (IS) are implemented within an organization for the purpose of improving the effectiveness and efficiency of that organization. But is it really improved in practice? And how do you know for sure that IS effected that.

4.3.1 Developments

There is a lot written about the effect of IS in organizations. Each author tries to describe the effect as useful and clear as possible. Remarkable is that there findings do not always match. Some studies have reported a positive relationship between IT investments and firm financial performance, whereas others have found no significant relationships.
Wight (1994) suggests that the use of information systems such as manufacturing resource planning (MRPII) within manufacturing organization are often the natural choice for improving process performance and organizational competitiveness. The reason for this is that such systems provide businesses with robust and responsive intra-organizational infrastructure;
Irani et al. (2001) draw attention to many of the human and organizational issues associated with its evaluation and management. Chung and Snyder (2000) identify the attempt being made by many organizations to expand their IS infrastructure beyond their organizational boundaries through developing inter-organizational business systems. Yet, such systems are not perfect and not without limitation. Hochstrasser (1991), argues that the high rate of IT/IS failure is partly attributable to a lack of solid but easy to use management tools for evaluating, prioritizing, monitoring, and controlling IT investments(Zahir 2002).

From a business point of view, an organization mostly focuses on value, on the effect IT has on the performance of the business. IT has not a direct value in the business domain, but the value lays mainly in the application of the technology, not on costs. The value of the information technology is derived from the capability it affords to the information system organization to

deliver its services to the different business units. The justification for information technology, then, is balance of the value and the costs assigned to the business, whereas viability is based on the value of the information technology to the IS organization(Zahir 2002).

In the past decade, organizations have increased their investments in IS significantly with the expectation that these investments will improve firm performance. However, some organizations continue to be able to garner better value from IS than others. This has created a need to better understand the sources of such differences and, consequently, the mechanisms by which IS contributes to firm performance(Zahir 2002).

In is showed with the developments in the literature, Information Systems (IS) have become an important tool for organizations. With the upcoming IT developments from the last years, information systems are getting more complex but also diverse so organizations can get the most benefit and competitive advantage. At least, that is what the intention is when information systems are developed. Are information systems the cause of a more efficient and effective organization? It is never possible to give complete evidence that a more efficient outcome of an organization is only caused by the introducing of a certain IS. However, it is possible to study the effect of it more in detail.

4.3.2 Facility Management Information System

Facility Management Information System (FMIS) is an integrated person-machinery system that serves information of the offered and available facilities that benefits the operational processes, the management supervision, the analysis and decision functions of the facility management organization. This forms the structure, management and automation of the business processes of the organization (Maas and Pleunis 2006).

The first part of the definition shows that a FMIS is an integrated person-machinery system. That means that a FMIS is more that a software package. It consists of a system with clear procedures and agreements that are necessary to make this system effective on the longer run.

Due to the economic downturn in the 1990's and the continuing need to reduce operating costs, organizations have realized that the building of automated systems will reduce costs and improve the performance of building systems. In addition, they realize that FMIS are also required to provide facility records information and support systems for planning and management purposes. FMIS technology has developed rapidly since the early 1990's and many FM departments have implemented component systems for use by specific work units (e.g., a maintenance management system for the Operations and Maintenance). However, they realize the limitations of these standalone systems and the industry trend is now for the development of an integrated FMIS that is comprised of several component systems and satisfies department wide needs.

4.3.3 Enterprise Resource Planning

ERP systems, or packages, are integrated sets of modules that allow companies to manage multiple operations including manufacturing, human resources, finance, and logistics. ERP permits a company to replace mission-critical legacy systems—notorious for their age, size, complexity, inflexibility, and fragmentation—with fully integrated systems (Boudreau and Robey 1999).

Thus the awareness that IS can reduce costs and improve the performance of their building is present. However, it is not fully recognised as an important tool that makes an organization more efficient as a whole. Empirical research is scarce, there are assumptions that the implementation of a FMIS tends to a more efficient and effective organization, but there is not a scientific foundation that, with help of well known models and theories and information from practice, demonstrates that fact(Chen 2001).

4.3.4 Agency theory

Agency theory rejects the classical view of the firm as a unified profit-maximizing identity and proposes an alternative model of a firm as an agency relationship build on a set of contracts of a set of self-interested agents.

The agency theory defines two problems that can occur within agency relationships. One of them is the agency problem, which arise when the desires of goals of an agent are in conflict with the principal and it if difficult or expensive to monitor what the agency is doing. In that way the principal doesn't have a view of what the agent is doing. The second problem has to do with the attitude towards risk, a problem of risk sharing. It may happen that the principal and agent have a different attitude towards risk, which can influence the way they prefer actions they take.

The theory focuses on the way a contract is leading with the relationship between the principal and the agent. That is why the prime goal is to determine the most efficient contract governing the relationship between the principal and the agent given assumptions about people organizations and information.

In the literature, the agency problem focuses on specific aspects. One aspect is 'moral hazard'. This refers to the lack of effort of the agent. It means that the agent it not giving the rights effort that is agreed-upon between the principal and agent. In other words, the principal is shirking. This can happen for example when a project is complex and the principal cannot see what the agent is really doing. 'Adverse Selection' has to do with the misrepresentation of the ability of the agent. He has not been honest about the capabilities and the skills he has. Both problems have to do with the unobservable behaviour of the agent. The principal has in this case two options. One option is to discover the agent's behaviour by investing in information systems. The other is to contract the outcome of the agent's behaviour.

The first solution is of interest in this research. The investments are needed at first, but will be earned back when the information system(s) are fully working in the organization.

On the other side the theory argues also that when the decision-making rights are pushed downward in an organization the costs of communicating upward will decrease, but the agency

costs will increase. It is important to find a situation where the sum of the costs is minimized. Information Technology (IT) can reduce costs by improving the quality of information communication and the speed of information processing and management's decision-making. It can even better. With help of improved monitoring capabilities and decentralized decision-making, the agency costs can be reduced. Therefore, in many ways the IT, in this case the information systems, can contribute the efficiency of an organization(Eisenhardt 1989).

4.3.5 DeLone and McLean

DeLone and McLean made an important contribution to the literature on IS success measurement because it was the first study that tried to impose some order on IS researchers' choices of success measures.

DeLone and McLean categorized over 100 IS "dependent variables" into six categories and developed an IS success model to describe the relationships between the categories. They concluded that IS success should be a multidimensional measure and recommended additional research to validate the model. Other researchers have since tested and expanded their model. DeLone and McLean have updated the model based on a review of research stemming from their original work. They concluded that their original model was valid and suggested that "service quality" be incorporated as an important dimension of IS success(DeLone and McLean 2003). The model is showed in Figure 4.

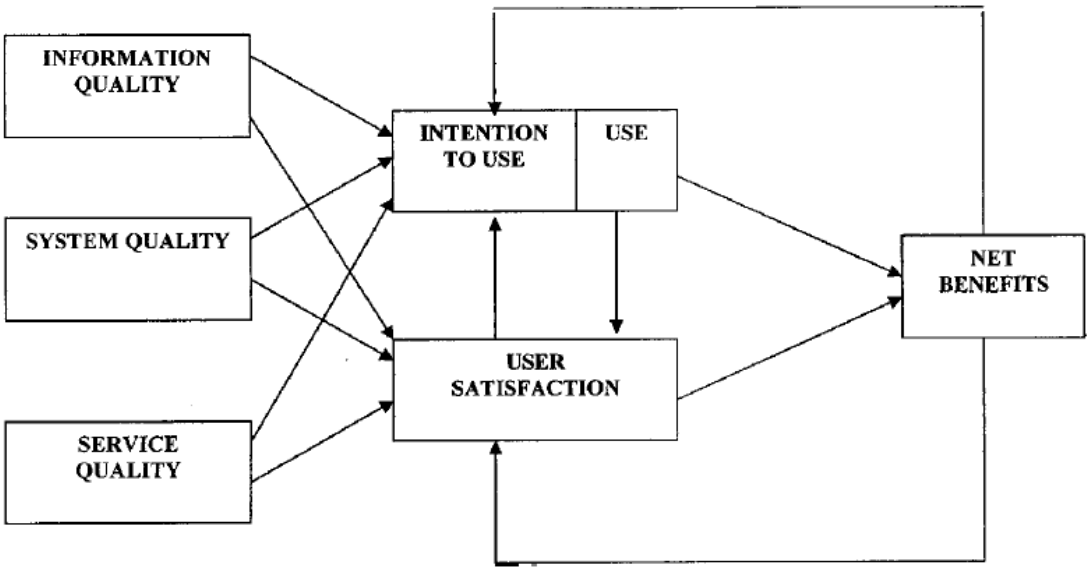

Figure 4: DeLone& McLean's Information System success model.

All blocks in the model exist of a separate measure subject. 'Net benefits' are the most important success measures, it includes all important elements of the different blocks. It captures the balance of the negative and positive impacts of information systems on customers, suppliers, organizations and markets.

4.4 Profit and not for profit organizations

In the first chapters an elaboration is made on the factors of organizational structure which influence the added value of an organization. Besides the factors of influence, there is one thing that covers all that. The main characteristics of an organisation have also a major influence on the needs on facilities and support services. Atkin and Brooks (2000) and Stephens (1994) notify that even within the same business sector, each organisation is likely to have different needs in facilities and FM function. The goal, priority and role of FM are likely to vary by the particular characteristic of the organisation due to many factors such as organisation's goals, characteristics, constraints, operation process and so on.

The business sector has also been regarded as a critical issue in FM practice (Price, 2004; McLennan, 2004; Nutt, 2004; Loosemore, 2004). It is a major factor in selecting facility and support services needed. Type of business affects operation processes of organisation, in turn influences on the need of facility. As can be seen in Figure 5 the business sector is covering the organizational characteristics as independent variable for the positioning of the FM function. Another higher level that covers all other issues is the Macro-environment/local context of an organization. In this research, this level will not be reached and will not be focussed on(Chotipanich 2004).

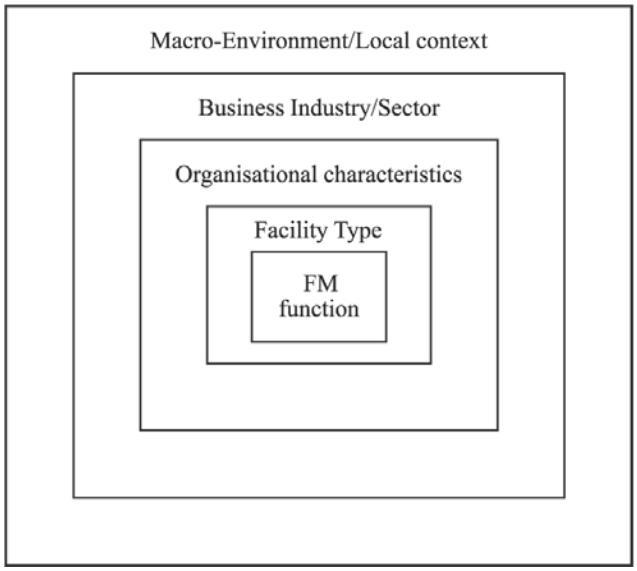

Figure 5: Context of the FM function

There are many ways to look at the differences in organizational context. It is possible to look at for example the differences between industries or the differences in size. What will be investigated in this research are the differences between profit and not for profit organizations. Because the characteristics of both differ between profit and not for profit, with respect to the goals and vision, a different management approach is used.

4.4.1 Different characteristics

To know if it is likely to say that there is a difference between profit and not for profit organizations when it comes to their professionalization in facility management, it is essential to understand the characteristics of the sectors. A main goal of profit organizations is, logically, making profit. Grijpdonk (1983) has identified profit as follows:

> *The positive financial balance of activities or transactions with a commercial character, which are quantified in cash-units.*

Logically, not for profit organizations are characterized with other goals than making profit. It is possible for a not for profit organization to make profit, but their main activities and processes focus on another way of added value (like service work or governance).

Like all organizations, non-profit organizations vary much in terms of mission, size, mode of operation and impact, particularly in a cross-national sense. Some are closer to the model of a government agency; others may indeed resemble the business firm; and yet others may be little more than an informal network. However, there is an emerging consensus among researchers in the field that non-profit organizations have the following core characteristics(Anheier 2000):

- *Organized*, possessing some institutional reality, which separates the organization from informal entities such as families, gatherings or movements;
- *Private*, institutionally separate from government, which sets the entity apart from the public sector;
- *Non-profit-distributing*, not returning any profits generated to owners or equivalents, which distinguishes non-profits from businesses;
- *Self-governing*, equipped to control their own activities which identifies those that are de jure units of other organizations;
- *Voluntary*, being non-compulsory in nature and with some degree of voluntary input in either the agency's activities or management.

Many non-profit organizations are facing greater uncertainty, particularly in the financial field, as government budgets are being cut back and as non-profit organizations are being asked to accept more responsibilities (Deakin in Anheier, 2000).

Besides the presence of uncertainty, not for profit organizations have to deal with the fact that they have different 'objectives'.

In the for-profit world, we have market prices for goods and services linking sellers and buyers, wages linking employers and employees (collective bargaining), profits linking shareholders and management. What is important to see is that at least in principle, all these prices result into one monetary objective. For-profit organizations asses their performance based on that. The management primary focus on financial measure, such as profitability and shareholder return, used by for-profit organizations to asses their performance. This is different in a not for profit organization. There is not one clear objective, but not for profit organizations often have to deal

with several objectives. Of course, the number depends on the structure of the organization(Anheier 2000). Yet management approaches need to be sensitive to the tendency of not for profit organizations to have multiple objectives, and that it is often difficult to indicate which ones are more important than others(Anheier 2000).
Multiplicity is therefore the signature of the not for profit organization. The challenge for management, then, is to develop models that identify their cultures, goals and operating procedures in an effort to establish some coherence and identity between mission, activities and outcomes(Frumkin and Clark 2000). Without that, it is hard to measure the performance of the organization and with that the added value. Because not for profit organizations still differ on this point from profit organizations, it is expected that profit organizations gain more added value with respect to not for profit organizations. Profit organizations have a clear monetary objective and a financial measure to asses the added value of an organization(Frumkin and Clark 2000).

4.5 Conclusion

In this chapter, two sub questions were important.
How can the added value of an organization be measured?
In the literature there is a lot written about added value. To make the term 'added value' measurable, it is necessary to split added value into operational terms, in this research called 'parameters'. To keep this research as similar as possible to the research in Austria, it is decided to use the same parameters to measure added value. These are: one-time and yearly savings, increase of productivity, advantages & savings and the perceived success of facility management in total.
The second question that stood central in this chapter is:
How can the facility management structure be measured?
With the theoretical background is decided to measure the structure of facility management on three factors: organization, coordination and ICT. This is done by making the terms operational in the following way.

- **Organization**: along with the developments of facility management, the organizational control of FM changes also. Because the market becomes bigger and more professional, the opportunities increase. Increasing more organizations decide to source their facility management out to an external contractor or organize their facility management in a shared way (facility sharing). Not all organizations are known with the newest developments in facility management. For that reason, this research focuses only on the outsourcing of facility management. The theoretical background underlines the assumption that organizations who outsource their facility management, gain more added value than organizations that control their facility management in-house. That is why in this research organizations are asked how they control their facility management functions and which percentage they sources out.
- **Coordination**: to measure the way facility management is coordinated in an organization, this research tests coordination on two aspects. First, by focusing on the

hierarchal place of facility management within the organization. Secondly, the focus is on the presence of a central service desk for facilities.

- **ICT:** ICT is an extensive topic which had a big influence on the developments of facility management. An information system has become an important factor with creating an organizational structure, in this case a facility management structure. For the facility management profession this was especially the case with a FMIS and/or an ERP system. This research focuses on the presence of one or both systems in an organization.

Besides the different structures of facility management, it is expected that a difference exists in added value between profit and not for profit organizations. With the theoretical background, it is expected that profit organizations have organized FM in such a way that they gain more value than not for profit organizations. This will be analyzed by comparing the outcome of profit organizations with the outcome of profit organizations. In the next chapter the conceptual model is given.

5. Conceptual Model

In this chapter a conceptual model is created that will form an input for the rest of the research. The model is based on the theoretical background from the previous chapters, of the dependent parameters and independent variables of this research which will be the basis for the statements that will be investigated in the empirical part. The independent variables, which are made operational in paragraph 4.5, are 'Organization', 'Coordination', 'ICT' and 'Sector'. The four working hypotheses are designed from the literature and represent each one independent variable. The working hypotheses that are tested in this research are:

1 Organization: Organizations who have completely outsourced their facility management functions will gain more added value, than organizations with (mostly) in-house facility management functions.

2 Coordination: Organizations who have a strong coordination between the organizational processes will gain more added value than organizations with weak coordination.

3 ICT: Organizations who introduced a FMIS and/or ERP gain more added value than organizations without an Information System.

4 Sector: Organizations in the profit sector gain more added value than organizations in the not for profit sector.

The term added value is measured with help of five parameters. The parameters are linked to the questions of the questionnaire (this will be explained in chapter 7).

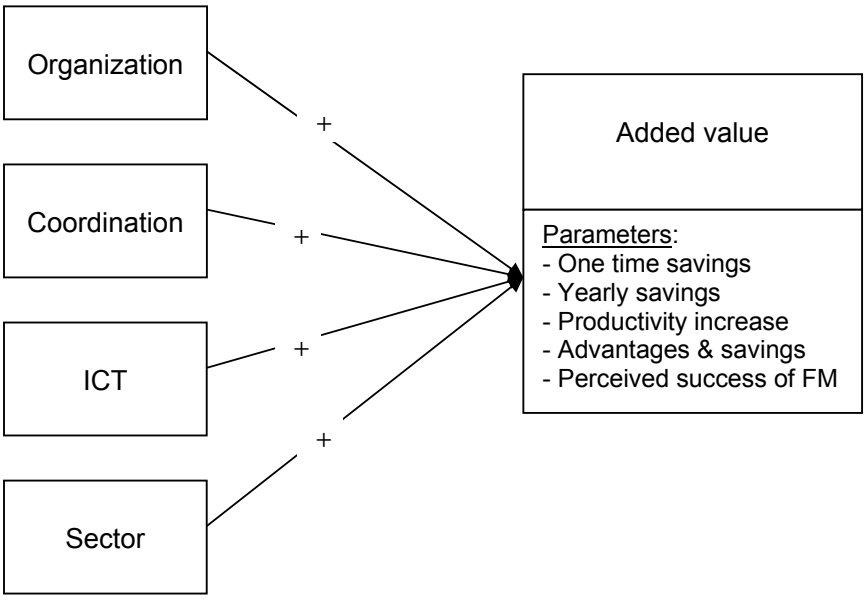

Figure 6: Conceptual model

Part III: Results

In this part the results from the empirical part in combination with the theoretical background will be discussed. Chapter 6 focuses on the survey that has been conducted. The methodology that is used needs to be justified. In chapter 7 the outcome of the survey will be analyzed according the working hypotheses of this research

6. Survey justification

In the previous part, the theoretical background is given for the survey which is conducted in the empirical part. The way the survey is conducted will be justified in this chapter, by describing the important elements.

6.1 Internet survey

In the first part the motivation for choosing quantitative instead of qualitative research is given. A survey is a good method to study a problem in depth by making use of a large quantitative dataset. The survey of this research is accomplished on the internet. The rapid expansion of Internet users has given Web-based surveys the potential to become a powerful tool in survey research. Because of the ease, speed of delivery and response and the cost savings, it has become more likely to choose for an internet survey above a regular one (Sills and Song 2002). The internet survey was carried out by formulating a questionnaire online with help of the necessary survey-software (ThesisTools 2007). After that, the questionnaire was distributed by sending a guiding letter to the selected sample (see Appendix III). In the letter the research was explained and a link to the questionnaire was given. After finishing the questionnaire, the respondents sent the questionnaire automatically by pressing on the sent button. In this way, an excel-database was created, which made it easy to implement all the data directly in SPSS.

6.1.1 Questionnaire

The basis of the questionnaire in this research was the questionnaire of Austria. Because this research goes further than just focusing on the differences between organizations with and without facility management, additional questions were added that were focused on the working hypotheses.

Before the questionnaire was send out, the questionnaire was tested and discussed in a pilot. Two employees of two different organizations filled in the questionnaire and looked critically to the questions. The first employee is head of the department Integrated Facility Management (IFM) of the FM-concern of the Wageningen UR. The second employee works at the FM-department of the local government in Ede. After the pilot, some questions were adjusted with the received feedback.

6.2 Population

The population of this research are all Dutch organizations with at least 500 fte. It is expected that organizations with more than 500 fte are familiar with the concept facility management. With help of the ‘Chamber of Commerce’, ‘Kamer van Koophandel’ in Dutch, a database was created(KvK 2007). Additional corresponding information about the population was gathered with help of sources of ‘Facility Management Nederland’ and ‘Capgemini’.

6.2.1 Selection of sample

The complete database existed out of 520 organizations. Contact persons were contacted by phone. The contact persons, who were willing to cooperate and leave their e-mail address, formed the sample of interest. The selection is similar to a random selection. The sample-size is scientifically calculated, and is above the needed sample with a population of 520 (Steekproefcalculator 2007)

To be able to send out the questionnaire digital, e-mail addresses were essential. To collect the e-mail addresses it was necessary to approach the most organizations by phone. The approached employee was the final contact person for facility management in an organization. Because most respondents were approached individually by phone in advance, a higher response-rate was expected.

7. Results

The empirical study was conducted in a quantitative way with help of a questionnaire (see Appendix 1). The questionnaire was produced on the internet en sent out to 240 organizations bigger than 500 fte. The response rate varied a lot between the questions, like is described in chapter 5. The average response was 30%. Because the outcome of the survey is not normally distributed among the questions, it won't be possible to carry out the analysis by parametrical tests. Because this research is a step further than exploratory and working hypotheses are used, the data is still suitable for analysis.

In chapter 5, independent variables that expected to have an influence on the added value of an organization were formulated in the conceptual model (see Figure 6). The structure of this chapter will be according these factors. To be able to test the relationship between the independent variables and the added value of an organization, the questionnaire existed of two sorts of questions. A part of the questionnaire was related to the parameters of added value, and a part was related to the independent variables and therefore also the working hypotheses. In this chapter, added value is analyzed according the independent factors of this research

7.1 Descriptive statistics

The final response on the questionnaire turned out to vary a lot per question, due the incomplete fulfillment of the questionnaire. Respondents who stopped with the questionnaire after a few questions were excluded from the dataset. Respondents who didn't answer all the questions, but did pay attention to a big part of the questionnaire, were left in the dataset. Most questions turned out to have a response rate around 30%. The respondents were asked in which sector their organization is active (see Figure 7). It turned out that there were fewer respondents in the sectors 'Real estate', 'Chemistry and Pharmaceutics', 'Catering service' and 'Mining Industry and Energy Supply'. In the sectors 'Government, public authority and education' and 'Production' the response rate was very high. This responds was expected, because the sample

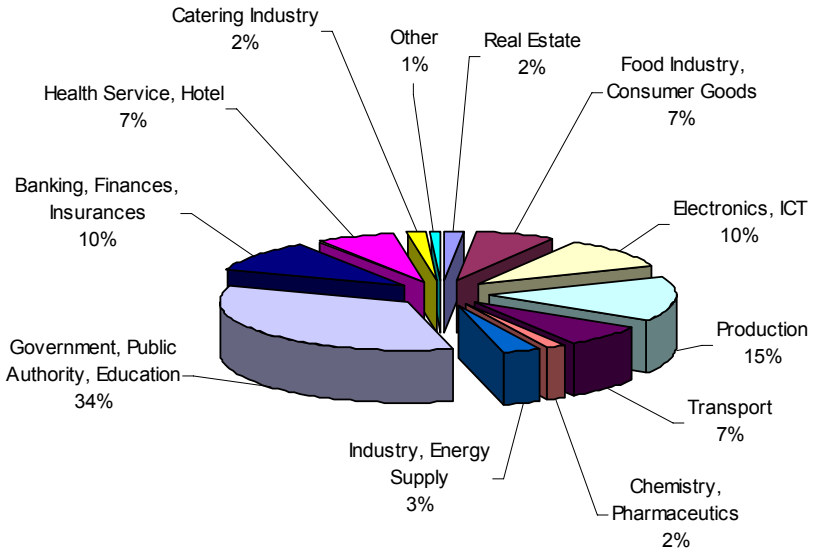

Figure 7: Sector division

The outcome showed that the answers were spread evenly with respect to the profit and the not for profit sector (see figure 8). Therefore, it is possible to compare the outcome of the two sectors. It showed that the gross of the respondents worked in organizations with more than 1000 employees and worked in an office environment. The outcome showed also that the biggest part of the organizations have an own FM-department and are completely familiar with the term 'Facility Management' (see figure 9). Therefore, the respondents are capable enough to fill in the questionnaire.

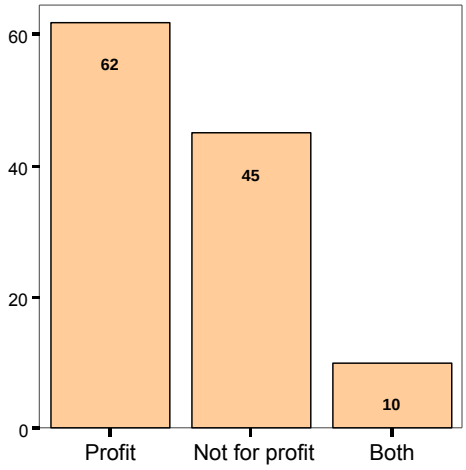

Figure 8: Profit and Not for profit

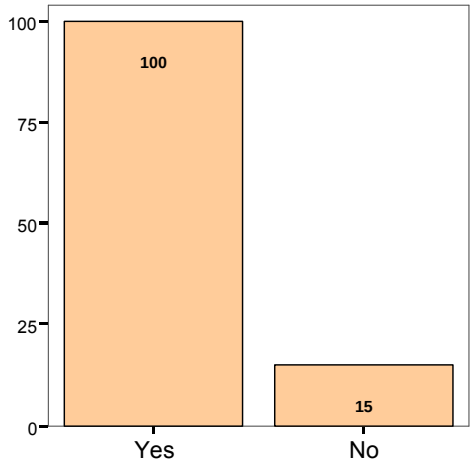

Figure 9: FM department

It turned out that the organizations with an ERP system are scarce. This is the reason why the analysis of the independent factor ICT will focus on organizations with an FMIS. Of the 99 respondents of this question, 59% make use of a FMIS (see Table 1).

		Frequency	Percent
Valid	No	30	25.6
	Yes	69	59.0
	Total	99	84.6
Missing	System	18	15.4
Total		117	100.0

Table 1: Presence FMIS

Of the respondents with an FMIS system, the greater part evaluates the system as 'Rather good' or 'Good'. The evaluation of the FMIS is presented in Table 2.

Evaluation FMIS		Frequency	Percent
Valid	Bad	2	1.7
	Poor	5	4.3
	Rather good	28	23.9
	Good	20	17.1
	Excellent	2	1.7
	No opinion	8	6.8
	Total	65	55.6
	Missing	52	44.4
Total		117	100.0

Table 2: Evaluation FMIS

7.2 Correlation between independent variables and parameters

In this paragraph the results will be analysed by evaluating if there is correlation between the independent variables and the degree in added value. The degree in added value will be measured with the parameters 'Advantages & Savings', 'Increase of Productivity', 'One-time savings' and 'Yearly savings' Each independent variable will be analyzed individually with respect to the degree in added value.

7.2.1 Organization

The variable organization focuses on the organizational control of the facility management services in an organization. Organizational control is measured by the degree of outsourcing of facility management activities. In the early eighties, a trend in outsourcing was already observed. The working hypothesis that is important in this part is:

1: Organizations who have completely outsourced their facility management functions will gain more on added value then organizations with (mostly) in-house facility management functions.

The respondents were asked in the questionnaire what the percentage was of their outsourced facility functions (see Appendix 1, question 33). To ease the analysis, answers were categorised into four ordinal ascending classes, where the first class represents 0-25% of the facility services are outsourced, the second class 26-50% of the facility services are outsourced, the third class 51-75% of the facility services are outsourced, and the fourth class 76-100% of the facility services are outsourced .

To see if the degree in outsourcing of facility management services has an effect on the added value of an organization, the degree in outsourcing is compared with the four parameters of added value of this research (see Figure 6). The respondents were asked what were the biggest advantages and savings since they introduced facility management in an organization on several aspects (see Appendix, question 23). Each perceived advantage or saving was classified in one of the three defined classes, to measure the degree of the saving. The first class represents the 'Advantages & Savings' of 0-25%, the second class 26-50% and the last class ≥51%. The

outcome of the two questions has been compared to see if the degree in outsourcing affects the degree in added value. The results are shown in Table 3.

The results are presented in a crosstab, only the respondents who filled in both questions were taken into account. The rows of the table are classified according to the outsourcing percentage. The columns are classified according the degree of advantages and savings and the sum of each row is presented in the final column 'Total'. It was possible for each respondent to choose multiple 'Advantages & Savings' within this question (see appendix 1, question 23). To see if there is a correlation, all answer possibilities are combined together. The first row of each outsourcing-class represent the total perceived 'Advantages & Savings' of all respondents together of all answer possibilities together. That is why these numbers are often higher than the number of respondents. The second row represents the number of respondents belonging to the total count in the first row. The third row represents the percentages of the distribution among the classes of advantages and savings within each outsourcing-class individually, with respect to the total count. The percentages are calculated over the total count. This is done because this number includes the complete degree of added value in each individual class, not only the number of respondents. The fourth row represents the percentages of the total of the two questions together. The total is based on the chosen answer possibilities, not on the respondents.

Outsourcing by class **N=58**		**Advantages & Savings** **0-25%**	**26-50%**	**>=50%**	**Total**
1 (0-25%)	Count	57.0	39.0	33.0	129.0
	Respondents	7.0	7.0	3.0	17.0
	% within outsourcing by class	44.2	30.2	25.6	100.0
	% of Total	5.3	3.6	3.1	12.0
2 (26-50%)	Count	239.0	116.0	63.0	418.0
	Respondents	29.0	16.0	12.0	57.0
	% within outsourcing by class	57.2	27.8	15.1	100.0
	% of Total	22.3	10.8	5.9	39.0
3 (51-75%)	Count	164.0	120	102.0	386.0
	Respondents	18.0	22.0	14.0	54.0
	% within outsourcing by class	42.5	31.1	26.4	100.0
	% of Total	15.3	11.2	9.5	36.0
4 (76-100%)	Count	98.0	34.0	8.0	140.0
	Respondents	10.0	4.0	2.0	16.0
	% within outsourcing by class	70.0	24.3	5.7	100.0
	% of Total	9.1	3.2	0.7	13.0
Total	Count	558.0	309.0	206.0	1073
	% of Total	52.0	28.8	19.2	100

Table 3: Outsourcing correlated with 'Advantages and Savings'

If the degree of outsourcing influences the degree in added value (in this case: the degree in perceived advantages & savings), the degree in added value should be higher when the degree

of outsourcing increases. The results in Table 3 do not underline this fact. There is no relation showed between the degree in outsourcing and the degree in Advantages & Savings.

The second parameter of added value 'Increase of productivity' (see Appendix 1, question 24) is structured in the same way as the parameter 'Advantages & Savings' The respondents indicated the degree of the increase of productivity on several points. The results of the two questions are analysed with a crosstab and are showed in Table 4.
If the degree in outsourcing influence the degree in added value (in this case: the increase of productivity), the degree of increased productivity should be higher when the degree of outsourcing increase.

Outsourcing by class N=57		**Increase of productivity**			**Total**
		0-25%	**25-50%**	**>=50%**	
1 (0-25%)	Count	19.0	7.0	12.0	38.0
	Respondents	7.0	17.0	20.0	44.0
	% within outsourcing by class	50.0	18.4	31.6	100.0
	% of Total	6.8	2.5	4.3	13.6
2 (25-50%)	Count	55.0	33.0	14.0	102.0
	Respondents	23.0	34.0	33.0	90.0
	% within outsourcing by class	53.9	32.4	13.7	100.0
	% of Total	19.6	11.8	5.0	36.4
3 (50-75%)	Count	58.0	28.0	22.0	108.0
	Respondents	22.0	24.0	38.0	84.0
	% within outsourcing by class	53.7	25.9	20.4	100.0
	% of Total	20.7	10.0	7.9	38.6
4 (75-100%)	Count	22.0	8.0	2.0	32.0
	Respondents	16.0	17.0	1.0	34.0
	% within outsourcing by class	59.0	25.0	16.0	100
	% of Total	7.9	2.9	0.7	11.4
Total	Count	154.0	76.0	50.0	280
	% of Total	55.0	27.1	17.9	100

Table 4: Outsourcing correlated with 'Increase of Productivity'

This is not the case when we look at the results in Table 4. Table 4 does not show a relation between the degree in outsourcing and the degree of increased productivity.

It was expected that the increased productivity would be higher when the degree in outsourcing increases. Table 4 doesn't show that.

One-time savings					
N=57		**1**	**2**	**3**	**Total**
Outsourcing by class	**1 (0-25%)**	71.4	14.3	14.3	100
	2 (26-50%)	76.2	9.5	14.3	100
	3 (51-75%)	73.7	26.3		100
	4 (76-100)	70.0	10.0	20.0	100
Total		73.7	15.8	10.5	100

Table 5: Outsourcing correlated with 'One-time savings'

Yearly savings					
N=52		**1**	**2**	**3**	**Total**
Outsourcing by class	**1 (0-25%)**	66.7	33.3		100
	2 (26-50%)	73.7	15.8	10.5	100
	3 (51-75%)	77.8	22.2		100
	4 (76-100)	66.7	22.2	11.1	100
Total		73.1	21.2	5.8	100

Table 5: Outsourcing compared with 'Yearly savings'

With the questions of the other two parameters of added value, the respondents were asked about the percentages of the 'Yearly' savings and the 'One-time' savings in they observe after introducing facility management (see Appendix, questions 25, 26). The percentages represent the total of savings regarding the situation before facility management was introduced, one-time and yearly. Just like the outsourcing percentage, these saving-questions were subdivided into even ascending ordinal classes, where the first class represents the percentages 0-33%; the second class represents 34-66% and the third class 67-100%. The results are showed in percentages of the variable outsourcing. The 'N' indicates the number of respondents who filled in the two questions. When we look at the 'one-time savings', it is not shown in Table 4 that the savings increase when the degree in outsourcing increase. The same counts for the yearly savings, no relation is shown between the two variables (see Table 5).

7.2.2 Coordination

2: Organizations who have a strong coordination between the organizational processes will gain more added value than organizations with weak coordination.

To measure the degree of coordination of the facility management department with respect to the whole organization, several questions were asked in the questionnaire. Because it is complex to measure the degree of coordination in an organization, two different topics of coordination are treated as a measuring-tool in this research.

The respondents were asked to fill in questions about the place of their facility management with respect to the whole organization. This is related to the place where the power of decision making is(Ytsma 2002). When facility management functions as a staff function, decisions are made more central in the organization. When facility management becomes a line function, it becomes

more a part of the organization and coordinates more with the rest of the organization because facility management is more part of the performing processes of the whole organization(Maas and Pleunis 2006). The other question was about the presence of a central service desk facility services in the organization. It is expected that the presence of a central service desk for facilities, strength the degree in coordination of facility management in the organization. With help of these two topics, the degree of coordination is measured.
The analysis of the outcome of these questions and the parameters of added value is done in the same way as is done with the independent factor organization.

Place FM in organization		**Advantages & Savings**			
N=60		**0-25%**	**26-50%**	**>=51%**	**Total**
Staff function	Count	189.0	130.0	94.0	413.0
	Respondents	25.0	22.0	17.0	64.0
	% within place FM	45.8	31.5	22.8	100.0
	% of Total	18.1	12.5	9.0	39.6
Line function	Count	174.0	348.0	109.0	631.0
	Respondents	38.0	27.0	15.0	80.0
	% within Place FM	27.5	55.2	17.3	100.0
	% of Total	16.7	33.3	10.4	60.4
	Count	304.0	537.0	203.0	1044.0
Total	% of Total	29.1	51.4	19.4	100.0

Table 6: Advantages & savings 'Place FM organization'

In the first place, the degree in added value is analyzed by evaluating the correlation between the parameter 'Advantages & Savings' and the place of the FM organization. With this comparison we want to know if the degree of added value (in this case: advantages and savings) is higher when a FM organization is line function within an organization than when it is a staff function.
The results of this comparison are given in the Table 6. The results show that when FM is a 'staff function' the accent is on the first class of advantages and savings (0-25%). When FM is positioned as a 'line function', the gross of the advantages & savings lay in the second class (26-50%). In this case, the degree of added value turns out to be higher with FM as a line function than FM as a staff function.

Place FM in organization		**Increase of productivity**			
N=63		**0-25%**	**25-50%**	**>=50%**	**Total**
Staff function	Count	55.0	39.0	24.0	118.0
	Respondents	38.0	36.0	30.0	104.0
	% within Place FM	46.6	33.1	20.3	100.0
	% of Total	20.8	14.7	9.1	44.5
Line function	Count	83.0	39.0	25.0	147.0
	Respondents	52.0	40.0	30.0	122.0
	% within Place FM	56.5	26.5	17.0	100.0
	% of Total	31.3	14.7	9.4	55.5
Total	Count	138.0	78.0	49.0	265.0
	% of Total	52.1	29.4	18.5	100.0

Table 7: Increase of productivity 'Place FM organization'

In Table 7 the place of the FM organization is compared with the parameter 'Increase of productivity'. The results show no clear relation; the place of FM does not influence the degree of increased productivity. In both situations, the accent lays on the first class of the parameter (0-25%). When the place of FM in the organization is compared with the yearly and one time savings, the results do not differentiate also. The results of the comparisons are shown in Table 8 and 9.

		One-time savings			Total
N=61		**1**	**2**	**3**	
Place FM	**Staff function**	79.2	12.5	8.3	100
in organization	**Line function**	69.4	13.9	16.7	100
%	**Low in organization**	100			100
Total		73.8	13.1	13.1	100

Table 8: One-time savings 'Place FM in organization'

		Yearly savings			Total
N=54		**1**	**2**	**3**	
Place FM	**Staff function**	76.2	23.8		100
in organization	**Line function**	75	15.6	9.4	100
%	**Low in organization**		100		100
Total		74.1	20.4	5.6	100

Table 9: Yearly savings 'Place FM in organization'

The accent of staff function as well as line function is on the first class in savings. The results do not show a higher degree in added value when FM is placed as a line function. The second measure of the degree in coordination is the presence of a central service desk for facilities in an organization. It is expected that the degree in added value is higher when there is a central service desk for coordinating all facilities of an organization. In Table 10 the results of the correlation is shown between the variable 'central service desk' and parameter 'Advantages & Savings'.

Central service desk N= 53		Advantages& Savings 0-25%	25-50%	>=50%	Total
Yes	Count	288.0	450.0	187.0	925.0
	Respondents	53.0	50.0	29.0	132.0
	% within Central service desk	31.1	48.6	20.2	100.0
	% of Total	26.2	40.9	17.0	84.2
No	Count	78.0	35.0	17.0	130
	Respondents	17.0	7.0	5.0	29
	% within Central service desk	60.0	26.9	13.1	100,0
	% of Total	7.1	3.2	1.5	11.8
Partly	Count	36.0	6.0	2.0	44
	Respondents	4.0	2.0	2.0	8
	% within Central service desk	81.8	13.6	4.5	100.0
	% of Total	3.3	0,5	0.2	4.0
Total	Count	402.0	491.0	206.0	1099.0
	% of Total	36.6	44.7	18.7	100.0

Table 10: Advantages & Savings 'Central service desk'

The results show that organizations that make use of a central service desk to coordinate their facilities score higher in the second class of added value (in this case: advantages & savings). The number of respondents who chose the option 'partly' is really small (4%) and is therefore not taken in to account.

The comparison with the parameter 'Increase of productivity' shows the same outcome, the results are presented in Table 11. The greater part of the perceived increase of productivity is classified in the highest classes when organizations do have a central service desk. Organizations without a central service score lower in added value, the accent is on the lowest class of increased productivity.

Central service desk N=55		Increase of productivity 0-25%	25-50%	>=50%	Total
Yes	Count	70.0	99.0	78.0	247.0
	Respondents	63.0	73.0	60.0	196.0
	% within central service desk	28.3	40.1	31.6	100.0
	% of Total	24.3	34.4	27.1	85.8
No	Count	21.0	10.0	2.0	33.0
	Respondents	12.0	7.0	4.0	23.0
	% within central service desk	63.6	30.3	6.1	100.0
	% of Total	7.3	3.5	0.7	11.5
Partly	Count	6.0	2.0		8.0
	Respondents	4.0	2.0		6.0
	% within central service desk	75.0	25.0		100.0
	% of Total	2.1	0.7		2.8
Total	Count	158.0	80.0	50.0	288.0
	% of Total	54.9	27.8	17.4	100.0

Table 11: Increase of productivity 'Central service desk'

In the Tables 12 and 13 the variable ‘Central service desk’ is analyzed by evaluating if there is a correlation between the independent variable and the parameters ‘One-time savings’ and ‘Yearly Savings’.

One-time savings					
N=61		**1**	**2**	**3**	**Total**
Central service	**Yes**	69.1	16.4	14.5	100
desk	**No**	100			100
%	**Partly**	100			100
Total		72.1	14.8	13.1	100

Table 12: One-time savings ‘Central service desk’

Yearly savings					
N=55		1	2	3	**Total**
Central service	**Yes**	69.4	24.5	6.1	100
desk	**No**	100			100
Total		72.7	21.8	5.5	100

Table 13: Yearly savings ‘Central service desk’

As the results show, all organizations without a central service desk to coordinate their facilities indicated their one-time and yearly savings to the lowest class. The accent of organizations with a central service desk still is on the lowest class, but a higher degree in savings is also indicated. Therefore you could say that the degree in added value in this case is higher when organizations make use of a central service desk.

7.2.3 ICT

3: Organizations who introduced a FMIS and/or ERP gain more added value than organizations without an Information System.

In the questionnaire one part of the questions was focussed on the management supporting systems FMIS and ERP. The results showed that there were not enough respondents with an ERP system to analyze with. That is why the analysis is done with the data about FMIS. Respondents were asked if their organization has a FMIS or not.

The analysis is done in the same way like the other independent variables. In Table 14, the presence of a FMIS is analysed with the parameter 'Advantages & Savings'. Expected is, that when organizations have a FMIS, the degree of added value (in this case: advantages & savings) is higher than organizations without a FMIS.

FMIS N=76		Advantages & Savings 0-25%	25-50%	>=50%	Total
No	Count	102.0	91.0	32.0	225.0
	Respondents	15.0	13.0	6.0	34.0
	% within FMIS	45.3	40.4	14.2	100.0
	% of Total	9.5	8.5	3.0	20.9
Yes	Count	236.0	441.0	173.0	850.0
	Respondents	39.0	49.0	24.0	112.0
	% within FMIS	27.8	51.9	20.4	100.0
	% of Total	22.0	41.0	16.1	79.1
Total	Count	327.0	543.0	205.0	1075.0
	% of Total	30.4	50.5	19.1	100.0

Table 14: Advantages & Savings 'FMIS'

The results clearly show that the degree in added value is higher when there is a FMIS present, than when there is not. When there is a FMIS present, the degree of added value is higher than when there isn't.

The comparison with the parameter 'Increase of productivity' show the also a relation, but the accent is less convincing. The degree in added value of organizations with a FMIS is spread out over the three classes. When we look at the results of organizations without a FMIS, the accent shift more to the lowest class. The results are shown in Table 15.

FMIS present N=76		Increase of productivity 0-25%	25-50%	>=50%	Total
No	Count	36.0	22.0	4.0	62.0
	Respondents	30.0	27.0	30.0	87.0
	% within FMIS present	58.1	35.5	6.5	100.0
	% of Total	12.6	7.7	1.4	21.8
Yes	Count	87.0	88.0	48.0	223.0
	Respondents	60.0	69.0	65.0	194.0
	% within FMIS present	39.0	39.5	21.5	100.0
	% of Total	30.5	39.5	16.8	78.2
Total	Count	123.0	110.0	52.0	285.0
	% of Total	43.2	38.6	18.2	100.0

Table 15: Increase of productivity 'FMIS'

The other two parameters concentrate on the perceived savings after introducing facility management in the organization. When we look at organizations with a FMIS, the degree in added value (in this case: one-time savings and yearly savings) increases when organizations make use of an FMIS. The results of the correlation are shown in Tables 16 and 17.

One-time savings					
N=78		**1**	**2**	**3**	**Total**
FMIS	**No**	97.5	2.5		100
%	**Yes**	56.7	23.0	20.4	100
Total		73.1	12.8	14.1	100

Table 16: One-time savings 'FMIS'

Yearly savings					
N=71		**1**	**2**	**3**	**Total**
FMIS	**No**	95.5	4.5		100
%	**Yes**	55.3	38.6	6.1	100
Total		74.6	21.1	4.2	100

Table 17: Yearly savings 'FMIS'

The greater part of the savings of organizations without a FMIS lays in the lowest class (95,5%). When organizations do make use of an FMIS, the savings are more distributed among the savings classes. The degree in added value increases when organizations make use of an FMIS.

7.2.4 Sector

4: Organizations in the profit sector gain more added value than organizations in the not for profit sector.

To see whether or not a profit organization relate more to the added value of organizations than the not for profit sector, the same comparison is used as in the previous paragraphs. The respondents were simply asked if there organization is part of the profit sector, the not for profit sector or both. Because the number of organizations that are active in the profit sector as well as the not for profit sector is low, the focus is only on the differences between the profit sector and the not for profit sector. In Table 18 the differences between 'Profit' and 'Not for Profit' are not very high with the question about 'advantages and savings'. It is shown that the accent of not for profit organizations is on the lowest class of added value (0-25%). The outcome of the profit sector is more distributed among the three different classes, but the greater part lays still in the first class. The degree of added value is a little higher in the profit sector than in the not for profit sector on this aspect.

Profit/ not for profit		**Advantages & Savings 0-25%**	**25-50%**	**>=50%**	**Total**
Profit	Count	286.0	226.0	102.0	614
	Respondents	36.0	44.0	28.0	108
	% within Profit/not for profit	46.6	36.8	16.6	100,0
	% of Total	27.1	21.4	9.6	58,1
Not for profit	Count	271.0	112.0	60.0	443
	Respondents	31.0	20.0	8.0	59
	% within Profit/not for profit	61.2	25.3	13.5	100,0
	% of Total	25.6	10.6	5.7	41,9
Total	Count	557.0	338	162.0	1057
	% of Total	52.7	32.0	15.3	100

Table 18: Advantages & savings 'Profit/ not for profit'

When the variable profit/not for profit is correlated with the parameter 'Increase of productivity', the same difference is shown in Table 19; profit organizations score higher on degree in added value than not for profit organizations. The accent changes from the first to the second class between the two sectors.

Profit/ not for profit		Increase of productivity 0-25%	25-50%	>=50%	Total
Profit	Count	59.0	72.0	30.0	161.0
	Respondents	62.0	63.0	62.0	187.0
	% within profit/not for profit	36.6	44.8	18.6	100.0
	% of Total	21.7	26.5	11.0	59.2
Not for profit	Count	66.0	31.0	14.0	111.0
	Respondents	45.0	42.0	43.0	130.0
	% within profit/not for profit	59.5	27.9	12.6	100.0
	% of Total	24.3	11.4	5.1	40.8
Total	Count	125.0	103.0	44.0	272.0
	% of Total	46.0	37.9	16.2	100.0

Table 19: Increase of productivity 'Profit/not for profit'

The last step is to compare the variable 'Profit/ not for profit' with the parameters 'One-time savings' and 'Yearly savings'. The results of the comparisons are given in the Tables 20 and 21.

		One-time savings			
N= 78		**1**	**2**	**3**	**Total**
Profit/ not for profit	**Profit**	46.7	35.4	17.9	100
%	**Not for profit**	90.0	6.7	3.3	100
Total		73.1	12.8	14.1	100

Table 20: One-time savings 'Profit/not for profit'

		Yearly savings			
N= 71		**1**	**2**	**3**	**Total**
Profit/Not for profit	**Profit**	48.6	45.7	5.7	100
%	**Not for profit**	92.1	4.3	3.6	100
Total		74.6	21.1	4.2	100

Table 21: Yearly savings 'Profit/not for profit'

The results show that both types of savings are evenly spread out over the two first classes in Profit organizations. The accent of the savings in Not for profit organizations is on the lowest class. In this case, the degree in added value is higher in organizations in the Profit sector than organizations in the Not for profit sector.

7.3 Nonparametric testing

Because the focus in this research will not be on testing of theory, no hypothesis will be accepted or rejected but supported or not supported. The working hypothesis designed for analyzing the results, present general assumptions that will be examined.

There are two ways of testing the data outcome of the questionnaire; in a parametric or nonparametric way. With the execution of parametric tests, the following pre-conditions are important:

- The scores of the sample have a normal distribution.
- The observations are independent
- The scores of the different test groups have an homogeneous variation

The pre-conditions and characteristics of a nonparametric test are:

- The variables should be on at highest ordinal level
- The focus of nonparametric test are on mutual relations or associations and measured on a more (semi) qualitative level

To test whether or not the distribution is normal, a Kolmogorov-Smirnov test can be executed. A Kolmogorov-Smirnov test is one of a number of goodness-of-fit tests that exist. Goodness-of-fit tests are designed to demonstrate that one or more samples are not normally distributed(Sheskin 2000).

In Table 22 the results of the 'tests of normality' of the variables of importance in this chapter are shown. A significant outcome of this test, represent a deviation of normality. As can be seen in Table 22 in the fourth column, the significance of all the variables is high. This means that all variables do not have a normal distribution.

Tests of Normality

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Profit/not for profit	.350	64	.000	.723	64	.000
Place FM	.342	64	.000	.686	64	.000
Central service desk	.518	64	.000	.365	64	.000
FMIS	.502	64	.000	.456	64	.000
Perceived success FM	.305	64	.000	.630	64	.000
Outsourcing by class	.270	64	.000	.857	64	.000

a Lilliefors Significance Correction

Table 22: Test of Normality

The outcome of the test of normality and the characteristics of this research are the main motives to make use of nonparametric testing. One of the side effects of nonparametric testing is that the test results are less precise than with parametric testing. Because of the use of working hypothesis, this will be allowed to analyze with. In the following paragraph the independent variables of this research will be tested in non-parametric way. After analyzing the independent variables in the previous paragraph with several parameters of added value, the following paragraph focuses on the perceived success of facility management in total.

7.3.1 Organization

The Kruskal-Walis test is a nonparametric test that tests the correlation between two or more independent variables. The test is based on ranked data. In the previous paragraph the

independent factor organization is analyzed by making a comparison with the parameters of added value of this research. This did not result in a confirmation of the stated working hypothesis. There was no relation shown between the added value of an organization and the degree of outsourcing.

In this paragraph the connection between the degree of outsourcing and added value is tested through another aspect. The respondents were asked in the questionnaire if they have experienced the introduction of facility management as a success or a failure (see Appendix 1, question 27). To see if there is a correlation between the answers of that question and the degree of outsourcing, a Kruskal-Walis test is performed. The outcome of the test exists of two tables: 'Ranks' and 'Statistics'. In the table 'Ranks' you see the amount of units and the mean rank. A mean rank symbolize the average score of each independent variable according to the dependent parameter (perceived success). To demonstrate: in the fourth column of Table 23, the mean ranks represent the average score of perceived success when the degree of outsourcing increases. In Table 23 you see that there is not a linear relation between the different Ranks of success of facility management and the increasing of the degree in outsourcing, the mean rank does not increase when the perceived success increases. The degree of outsourcing is measured as if it increases from class 1 to class 4. The test tests, with help of mean ranks if, when the degree of outsourcing increases, the perceived success increases also. The table does not show in this case, that when the perceived success is higher, the degree in outsourcing has a higher 'mean rank'. In the second table the test statistics are shown. The 'mean ranks' are tested with help of a chi-square. In this case it is not interesting to look at, because there is no significant correlation (>0.05).

Ranks

	FM.perceived.success	N	Mean Rank
Degree in outsourcing	Success	43	36.49
	Rather success	25	33.00
	Rather failure	2	45.50
	Total	70	

Test Statistics(a,b)

	Outsourcing. by class
Chi-Square	1.081
df	2
Asymp. Sig.	.583

a Kruskal Wallis Test
b Grouping Variable: FM.perceived.success

Table 23 : Kruskal Walis test 'Outsourcing'

7.3.2 Coordination

Just like with the independent factor organization, this factor will also be tested with help of nonparametric testing. It is done in the same way as in the previous sub-paragraph. To see if the introduction of facility management is rated higher with coordination is stronger; the two variables that are compared in the previous paragraph will be tested in a Kruskal-Walis test.

The first test is conducted with the variable 'central service desk. The outcome in Table 24 shows that the introduction of facility management is rated more as a success when there is a central service desk for the coordination of all facilities. The connection between the two variables is tested with a chi-square in the table test statistics. The chi-square is 20.932 and highly significant (<0.01).

This means you could state that there is a positive difference in the way the introduction of facility management is rated with respect to the attendance of a central point for the apply of facility services.

Ranks

	FM.perceived. success	N	Mean Rank
Central service desk	Success	47	40.38
	Rather .success	27	37.78
	Rather. Failure	2	4.00
	Total	76	

Test Statistics (a,b)

	Central service desk
Chi-Square	20.932
df	2
Asymp. Sig.	.000

a Kruskal Wallis Test
b Grouping Variable: FM.perceived.success

Table 24: Kruskall Wallis test 'Central service desk'

The second test is done with the variable 'Place FM in organization'. The outcome of the test is showed in Table 25. With respect to the outcome of the mean ranks, there is not a linear relation shown between the hierarchal level and the ranking of the facility management organization. The outcome shows that the chi-square is 5.714 with a p-value of 0.057. This means that the outcome is almost significant. The results of this test do not show a clear outcome to conclude anything on.

Ranks

	FM.perceived success	N	Mean Rank
Place FM in organization	Success	43	31.94
	Rather success	23	40.67
	Rather failure	2	18.50
	Total	68	

Test Statistics (a,b)

	Hierarchal level
Chi-Square	5.714
df	2
Asymp. Sig.	.057

a Kruskal Wallis Test
b Grouping Variable: FM.perceived.success

Table 25: Kruskal Wallis Test 'Hierarchal level'

7.3.3 ICT

In the previous paragraph, a comparison was made between the added value of organization with FMIS and organizations without FMIS. The results showed clearly that organizations with a FMIS scored higher on added value, than organization without a FMIS. To get a better view, the outcomes are also tested on the connection between the presence of a FMIS and the degree of success of a facility management organization. This is also done with help of a Kruskal-Walis test. The outcome is showed in Table 26. The test exists again of two tables; one of Ranks and one of 'Test Statistics'. When all independent mean ranks are observed, you see that the mean rank of 'success' is higher than 'rather success' and much higher than the option 'rather failure'. The option 'failure' is kept out of the test, because no organizations with a FMIS experience the introduction of facility management as a total failure.

In the second table the test statistics are shown. The chi-square is 8.245 with a p-value of 0.016. This means that the differences in ranks are highly significant. The higher the chi-square, the stronger the causal relation between the two variables. In this case the chi-square is 8.245, what is not really high but also not extremely low. Therefore, you could state that there is a difference between the way the introduction of facility management is rated in when there is a presence of a FMIS in the organization. When there is a FMIS present in the organization, the introduction of facility management is seen more as a success than as a failure.

Ranks

	FM.perceived success	N	Mean Rank
FMIS	Success	44	38.69
	Rather .success	27	36.39
	Rather. failure	2	8.00
	Total	73	

Test Statistics(a,b)

	FMIS presence
Chi-Square	8.245
df	2
Asymp. Sig.	.016

a Kruskal Wallis Test
b Grouping Variable: FM.perceived.success

Table 26: Kruskal Wallis test 'FMIS'

7.3.4 Sector

In the previous paragraph, the added value of an organization is analyzed on the correlation between a profit or not for profit organization and the degree in added value. This is done by making a comparison between not for profit organizations and profit organizations. With findings in the literature expected is that profit organizations are further developed on organizational design, than not for profit organizations. In the comparison of the previous paragraph is shown that organizations in the profit sector scored higher on all the variables of efficiency and effectiveness. On the other hand, the differences in percentages were not really large. Mostly, there was an average difference of 20 percent.

To study the difference in scores a bit more, the data on profit vs. not for profit will also be tested on the perceived success of the introduction of facility management. The outcome of the Kruskal-Walis test showed that the scores of the 'mean ranks' did not show a linear relation, the results are showed in Table 27. It even looks like the scores on rather failure are higher in a profit organization. The mean ranks are tested in the table 'test statistics'. The outcome of the test statistics shows that there is no significant relation between the difference in mean ranks and the context of a profit organization. Therefore is it not possible with the outcome of this test to suggest a causal relation between the sector (profit vs. not for profit) and the perceived success of the introduction of facility management.

Ranks

	FM.perceived success	N	Mean Rank
Profit/not for profit	Success	43	37.92
	Rather success	25	30.30
	Rather failure	2	48.50
	Total	70	

Test Statistics(a,b)

	Profit vs. not for profit
Chi-Square	4.362
df	2
Asymp. Sig.	.113

a Kruskal Wallis Test
b Grouping Variable: FM.perceived succes

Table 27: Kruskal-Walis test 'Profit and not for profit'

Part IV: Conclusions and Discussion

The results described in the previous part and the theoretical background in the second part form the input for the conclusions and discussion in this part. This part exists out of two chapters, chapter 8 focuses on the general conclusions, in chapter 9 some points of this research will be discussed and recommendations for further research are given.

8. Conclusions

In this chapter the final conclusions will be given. This chapter is structured according the independent variables of this research, the working hypotheses and the sub-questions.
The objective that was the central focus of this research corresponds with the central question and exists of a central goal and a sub-goal.
The objective is as follows:

1) Gain insight in the effect of the introduction of facility management on the added value in relation with the facility management-structure. 1.1) Gain insight in the differences in effect that exist between profit and non-profit organizations.

In the first four paragraphs, the conclusions by independent variable and working hypothesis are given. The last paragraph concentrates on the research questions.
In the end of this chapter, the central question is evaluated to see if it's possible to answer it.
This central question and objective are set up at the beginning of this research. With the lack of knowledge of the added value of facility management and the research that is done in Austria, one central question was formulated to function as guideline through the research.

The central question of this research is:
"What is the relationship between different ways of organizing Facility Management and the added value of organizations?"

8.1 Organization

There are different ways in organizing facility management in an organization. Throughout the years facility management went to numerous transformations. Outsourcing came over to the Netherlands and became quickly a popular subject with respect to the outsourcing of facility management. With the increasing complexity of organizations, it became essential to professionalize the support processes. Because organizations needed to focus on the core process more, outsourcing became even more popular. The market for suppliers and contractors was born and several formats were developed. Maas & Pleunis (2006) distinguished several forms of outsourcing, where integrated outsourcing is the most extreme one. Many authors underline the fact that it is important for organizations to concentrate on their core competence (Maas, 2006). They state that all processes that require a lot of management attention should be outsourced. Therefore it is logical step for the management to decide to outsource all secondary supportive processes to an external contractor (Hamel & Prahalad in Maas, 2006).

In this research an examination is done on the degree of outsourcing of facility management. The hypothesis that formed the central focus point was:
1: Organizations who have completely outsourced their facility management functions will gain more added value than organizations with (mostly) in-house facility management functions.
In the previous chapter the most important results of the independent variable organization are described by analyzing the degree of outsourcing and the added value of an organization. First, the correlation between the degree of outsourcing and the different added value parameters was evaluated. Besides that, the degree of outsourcing was tested with respect to the perceived success of facility management. The results show that there is not a clear correlation between the degree of outsourcing and the added value of an organization. The degree of added value does not increase when the degree of outsourcing increases. The nonparametric Kruskal-Walis test, that tested the relation between the outsourcing degree and the perceived success of facility management, also didn't show any relation. Besides that, the test was not significant. It is reasonable that the differences in perceived success among the four classes of outsourcing are coincidence. It can be concluded that the results of this study are all not in line with the theory. In front of the empirical study it was expected that when an organization who outsource more of their facility activities, score higher on added value than organizations who manage their facility management in-house. The outcome is surprising because the market of external service providers is still successfully increasing each year (Maas, 2006). Therefore, based on this test, it can be concluded that there is no significant relation between the degree of outsourcing of an organization and the way respondents perceive the value of their facility management organization. With no significant relation between 'organization' and dependent parameters of added value, it is not possible to accept the working hypothesis and will therefore be rejected.

8.2 Coordination

Coordination is a comprehensive factor, which has a large influence on the structuring problem of an organization. Coordination shows a lot of overlap with the factor integration. As is defined by authors like Lawrence and Lorch (1986) and Keuning & Eppink (2004), integration is the act of combining and coordinating several part of an organization. Overall is the term 'coordination' used in this research. The literature shows many different approaches when it comes to coordination. Thompson (1967) ties coordination to interdependency. He distinguishes three different types of interdependencies pooled, serial and reciprocal interdependency. Porter treats coordination by making a clear distinction between the primary and secondary processes of an organization. Mintzberg (1990) focuses on six different coordination mechanisms for the organizational structure. Finally, structuring the power of decision making is also a way of coordination (Ytsma, 2002). The power of decision making depends for a great part on the place of the facility management function in an organization.
The independent variable coordination is examined with help of the following working hypothesis:
2: Organizations who have a strong coordination between the organizational processes will gain more added value than organizations with weak coordination.

The analysis is done with two independent variables: the presence of a central service desk for facilities and the position of the FM department in the organization. The data of the two independent variables were analysed by evaluating the correlation of the independent variables with the dependent parameters of added value. The outcome didn't show a correlation between the different ways in positioning facility management and the added value of an organization. It did show a correlation between the presence of a central service desk and the added value of an organization. Organizations with a central service desk for coordinating their facilities, scored higher in added value than organizations without one. The nonparametric Kruskal-Walis test, that tested the relation between the kind of coordination and the perceived success of FM, showed the same. The outcome of the test with the independent variable 'central service desk' showed that there is a positive significant relation between the presence of a central service desk and the perceived success of FM. When a central service desk is present, the degree in added value is higher. The test with the independent variable 'position FM' was significant, but did not show a clear relation (see paragraph 7.3.2). It was expected that when facility management is positioned lower in or in line with the organization, the degree in added value would be higher. This, because the management decisions can be coordinated more in line with the whole organization. The power of decision making is more decentralized. The outcome of this research did not show that organization with facility management as a line function or a decentralized function score higher in added value.

Because the results of this independent variable 'coordination' are not convincing and unambiguous, the working hypothesis cannot be supported. This is why the working hypothesis is rejected.

8.3 ICT

In the past decade, ICT went through many developments which effected the structure of organizations drastically. The last century Information Systems (IS) have become an important tool for organizations. Because of the upcoming ICT developments in the last years, information systems became more complex but also diverse. This is why organizations can get the most benefit and competitive advantage. With the developments of IS in general, Facility Management organizations developed their own Facility Management Information Systems (FMIS) with as main goal to ease the support of the primary process of an organization. Besides FMIS, Enterprise Resource Planning (ERP) became also a popular way to adjust the organizational processes more successfully.

The independent variable ICT is examined in this research with help of the following hypothesis:

3: Organizations who introduced a FMIS and/or ERP gain more added value than organizations without an Information System.

The added value of Information Systems was investigated by asking if there is a relation between organizations were a FMIS is implemented and the success of facility management in an organization. The respondents were asked if they implement a FMIS is their organization or not. The results show that, among the respondents who notice an increase of added value since the existence of facility management, the greater part make use of a FMIS in their organization. The

parameters ‘Advantages & Savings’, ‘Increase of productivity’, ‘Yearly Savings’ and ‘One-time Savings’, all show a correlation between the presence of a FMIS and the degree of added value.
The relation between the perceived success of a facility management organization and the presence of a FMIS is tested in a Kruskal-Walis test. The test showed that there is a positive significant relation between the differences in perceived success of facility management and the presence of a FMIS. When there is a FMIS implemented in an organization, the degree in added value is higher.
With these results, it can be said that there is a positive relation between the degree in added value and the presence of a FMIS. Therefore, based on these results, the working hypothesis will be accepted.

8.4 Sector.

Besides the organizational structure, organizational characteristics are an important factor that will influence the management, in this case facility management, of an organization. A way to examine if a difference in type of organization influences the added value of an organization is looking to the differences between profit and not for profit organizations. The literature describes that the different characteristics between profit and not for profit organizations have an influence on the management approach. Not for profit organizations do not have a price-signal which indicates the value a customer gives to a product or a process. That’s why it is more difficult to measure the effectiveness of a not for profit organization any management processes to that. Therefore, it is expected that profit organizations are more professionalized with respect to their facility management than not for profit organizations. This independent variable is analysed with the following working hypotheses.
4: Organizations in the profit sector gain more added value than organizations in the not for profit sector.
It turned out that the outcome of the survey was evenly distributed among the two sectors. The results of the parameters ‘Advantages & Savings’ and ‘Increase of productivity’ show a clear correlation between the degree in added value and the difference in sector. The other two parameters (‘Yearly’ and ‘One-time’ savings), show less correlation. A reason for that could be that not for profit organizations perceive added value differently than profit organizations. Their focus is less on savings than profit organizations. Still most of the data showed that not for profit organizations score on the lowest class of added value.
Secondly, a Kruskal-Walis test is used to see if there is a relation between the difference in perceived success of facility management in a profit or not for profit organization. The outcome of that test showed that there is no relation, and there is no significant difference in the perceived success of facility management and the change from not for profit to profit.
Based on the examination of these aspects, there is not enough evidence to say that profit organizations gain more added value than not for profit organizations. The working hypothesis is therefore not accepted.

8.5 Overall conclusions

In this paragraph the sub-questions of this research are evaluated. With help of that, the central question is answered in the end of this paragraph. Before that, the conceptual model of this research is evaluated.

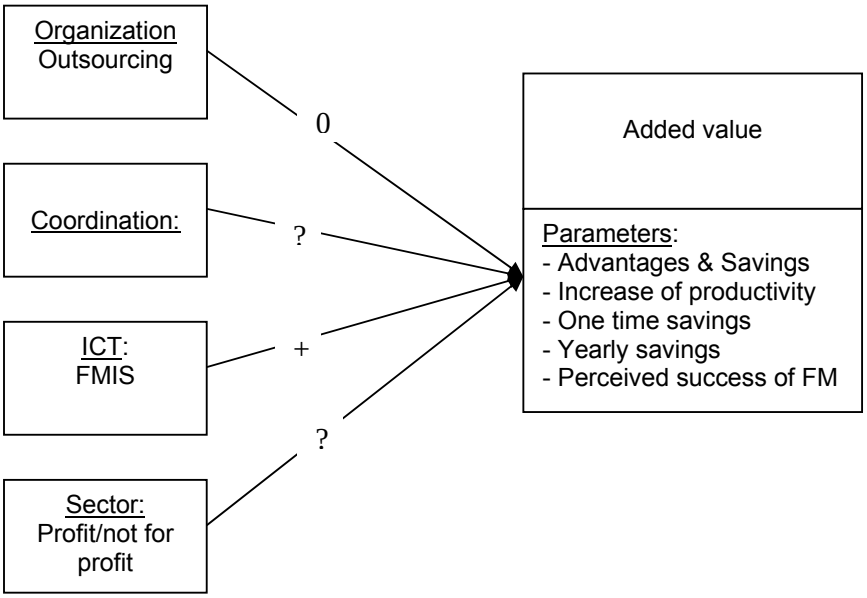

Figure 10: Conclusion conceptual model

With respect to the conclusions that were discussed in the previous paragraphs, a conclusion of the conceptual model is given in Figure 10. The independent variable 'Organization' was measured with the degree of outsourcing of an organization. Based on the results of this research, it is showed that the degree in outsourcing does not influence the degree in added value. The independent variable Coordination was measured on two topics: the presence of a central service desk for coordinating the facilities of an organization and the place of the FM-department in an organization. The results of the two topics were not consistent. The topic 'Central service desk' did correlate with the degree in added value on all parameters of added value, but the topic 'Place of FM-department' showed no correlation with the degree in added value. Therefore, more research is necessary to give a conclusion on this factor. The independent factor ICT is measured with the variable 'FMIS'. Based on this research it is showed that there is a positive correlation between organizations with a FMIS and the degree in added value. The independent variable 'Sector' is analysed by discussing the differences that exist between profit and not for profit organizations. The outcome did not show a clear correlation on the parameters 'One-time savings' and 'Yearly savings'. The parameters 'Advantages & Savings' and 'Increase of productivity' showed a positive correlation with the degree in added value. With these results it is not possible to give a conclusion on this factor.

1. How can the added value of an organization be measured?

The added value of an organization includes many different aspects. That is why, the focus points of this research were organizational structure and sector.

To make 'added value' measurable it was essential to create four dependent parameters, whereof the performance influenced the degree of added value. The parameters were designed in line with the research in Austria, and were: 'Advantages & Savings', 'Increase of productivity', 'One-time savings' and 'Yearly Savings'. With help of the dependent parameters that were used during this research it was not possible to measure the added value of an organization on all fronts. The parameters focussed mainly on the savings of an organization and the increased productivity, other aspects were not taken into account. It turned out that dependent parameters were capable for the measurement of added value, but were difficult to fill in for the respondents. This could by an important cause for the low response.

2. How can organizations be distinguished into different types, with respect to the way their facility management is organized?

To be able to answer this question is was essential to study the literature of facility management in detail. It turned out that there are many ways of typifying a facility management organization. With help of the NEN 2748, facility functions can be typified individually. The three facility management types of Becker (1990) distinguish facility management organizations by the degree of development. Because this research focuses on the different structure and organization of facility management, the outcome could have led to an addition on the typology of facility management. It turned out that the results of this study was not complete enough to base a new typology, or an addition to one.

3. How can the facility management structure be measured?

The answer to this question is extensively discussed in Part II, Theoretical background. With this theoretical background and the research of Austria as basis, three independent variables were designed which expected to influence the facility management structure: Organization, coordination and ICT. These variables were used to measure the facility management structure in organization. The independent variable 'Organization' is measured by the degree of facilities outsourced to an external service provider. The independent variable 'Coordination' is measured in two ways. First, by analyzing the correlation between the degree in added value and the presence of a central service desk. Second, by analyzing the correlation between the degree in added value and the place of facility management in an organization. The independent variable 'ICT' is measured by analyzing the degree in added value and the presence of a Facility Management Information System (FMIS).

4. *What are the most important differences that can be found in organizational structure of facility management?*

In the analysis of this research, the correlation between the dependent and independent factors is discussed.

Based on the results of the analysis, it can be concluded that a facility management organization that focuses on a strong coordination is more successful than facility management organizations with a weak coordination when the variable 'Central service desk' is analysed. The results of the variable 'Place Facility Management' show no correlation. This is why it is not possible to accept the working hypothesis of the independent variable coordination. It also showed that organizations, who introduced a Facility Management Information System (FMIS), are more successful than organizations without. The above described conclusions are the differences that can be defined because a correlation is found between the independent and dependent variables. The differences with respect to the independent variable 'Outsourcing' are hard to define because the results showed no correlation with the parameters of added value.

5. What differences can be found between profit and not for profit organizations caused by the introduction of Facility Management?

The literature underlines the different characteristics and objectives of profit and not for profit organizations. This causes a difference in management approach. Because it is harder for not for profit organizations to measure the effectiveness of their core processes and products, it will be harder to manage them.

The results of the empirical part showed a slightly higher outcome of the scores on added value of profit organizations than not for profit organizations. On the other hand, there is no relation shown between the different sectors and the perceived success of facility management. The reason for that could be that not for profit organizations have another vision on the value of their organization than profit organizations.

6. What is the effect of the results of this research on the current FM typology?

Because the outcome turned out to be not as expected, it is not possible and representative to create a new typology of facility management. Further research is essential to look more into detail to the differences. After that, it could be more reasonable to create a new typology. Therefore, it is not yet possible to design a new pattern of facility management types in this moment.

"What is the relationship between different ways of structuring Facility Management and the added value of organizations?"

As a final conclusion, the central question is answered in brief. It is shown that there is a relation between the different ways of structuring facility management and the added value of organizations. The factors that especially showed al relation were the factors 'Coordination' and 'ICT'. The results with respect to the independent variables 'organization' do not show a relation.

The relation between the differences in profit a not for profit with respect to the added value of an organization is not shown strong with this research.

9. Discussion and further research

In this chapter there is room for discussion. With doing research and writing a paper, there are always points for discussion. The discussion focuses on points that can be done differently in the future or points that didn't go as expected. In the end of this chapter some suggestions for further research are given.

Comparison Austria/Netherlands

A main motive for doing this research was the research that was conducted in Austria. At first it was the intention to structure the research here in the same way. In the first place for the benefit of Austria, so they can compare the results of the two countries and possible adjust their further research in the future. On the other hand for the benefit of this research, to make the comparison between the two researches as a part of the objective. Eventually only the first part of the plan is worked out, and the comparison did not become part of this research. Maybe it would have been better to make that decision earlier. That could have led to fewer uncertainties in the beginning of this research. On the other hand, by following the structure of Austria, it is still possible to make that comparison in the future.

Questionnaire

As addition to the previous part, the questionnaire is now discussed. It was the intention to structure the questionnaire in the same way as is done in Austria and keep the questions most of the time in tact. Decided is to keep all questions in the questionnaire, otherwise it is not possible for Austria to compare the data outcome in the future. For the objective of this research some additional questions have been added. This resulted in an extensive questionnaire, including some complex questions to answer. This could have been the reason for the bad quality of the final response. The general response was not really low (around 30%), but the individual response per question was really divers. This is why the data was not normally distributed and made it hard to carry out proper tests. The reason for that could be that many questions were ambiguous and complex. That is why it was hard for some respondents to fill in. The quality of the questionnaire may have been higher, when fewer questions were asked and the questions were less complex.

Research strategy

For this research a quantitative research approach is chosen. Quantitative research within the FM profession is really scarce; most research is done in a qualitative way. The surplus value of this research is that the added value of facility management is analyzed on a larger scale. More research units have been taken into account, therefore a more general view has been given with this research. It could also have been a possibility to develop a combining approach, quantitative as well as qualitative. Some subjects could have been approached qualitatively instead of quantitatively, and the uncertainty of wrongly interpreted questions would be less.

Further research

For the future it would be interesting to do some more research on this subject.

- Because the results of the research are not suited to state hard facts on, it could be interesting to repeat the research in a more extensive way and take more time into account. It would be possible to extend the sample to a larger group and guide the respondents more in providing the right information.
- It may be interesting, after the comparison with Austria, to work more together with other countries and see if there are cultural differences which affects the added value of an organization.

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Appendices:

Appendix I: **Questions Dutch questionnaire (WORD)**

Appendix II: **Guiding letter questionnaire**

Appendix I: Questions Dutch questionnaire (WORD)

Algemeen

1. In welke sector is uw organisatie actief?

( ) Vastgoed
( ) Voeding/ consumentenzaken
( ) Elektronica/ informatie services communicatie
( ) Productie
( ) Transport
( ) Anders nl.:
( ) Chemie/ farmacie
( ) Energie
( ) Overheid/publieke instelling/ onderwijs
( ) Financiën/ verzekeringen
( ) Gezondheidzorg
( ) Horeca

2. Is uw organisatie actief in de profit- of de non-profit sector?

( ) profit
( ) non-profit
( ) beide

3. Hoeveel werknemers zijn er in uw organisatie actief?

( ) < 50
( ) 50-100
( ) 101-300
( ) 301-500
( ) 501-1000
( ) meer dan 1000
( ) weet niet

4. Hoeveel werknemers zijn er in uw organisatie actief op een kantoorwerkplek?

( ) < 50
( ) 50-100
( ) 101-300
( ) 301-500
( ) 501-1000
( ) meer dan 1000
( ) weet niet

5. Wat is de omzet in het laatste volledige boekjaar van uw organisatie (in €1000)?

6. Wat zijn uw exploitatiekosten huisvesting (in €1000, volgens NEN 2748)?

7. Wat is de waarde van uw vastgoed op uw balans (in €1000)?

8. Over hoeveel gebouwen beschikt uw onderneming?

9. Wat zijn de kosten van vastgoed/huisvesting in het laatste volledige boekjaar per $m^{2?}$ [€/ m^2]

10. Wat zijn de kosten per fte(in €1000?) [€/ fte]

11. Hoeveel bruto m^2 kantoorruimte heeft u?

12. Kent u de term 'Facility Management'?

( ) Ja
( ) Nee
( ) weet niet

13. Wat zijn de totale facilitaire kosten per m^2? [€/m^2] (vastgoed/huisvesting plus alle diensten en middelen)

14. Wat zijn de totale facilitaire kosten per fte? [€/ fte]

Organisatie

15. Hebt u een eigen Facility Management afdeling die verantwoordelijk is voor alle FM activiteiten?

( ) Ja ( ) Nee(ga verder naar vraag 20)
( ) Weet niet

16. Welke van de volgende activiteiten worden door uw organisatie gecoördineerd door Facility Management en voor welke activiteiten draagt u de eindverantwoordelijkheid (aankruisen wat van toepassing is)?

	Deze activiteit behoort tot uw FM-afdeling	**Uw FM-afdeling draagt de eindverantwoordelijkheid t.a.v de activiteit**
Bedrijfsrestaurant		
Ruimtebeheer		
Werkplek(service)		
Technisch onderhoud		
Dranken- en versnaperingvoorziening		
Receptie		
Catering t.b.v evenementen		
Verhuizingen		
Beveiliging en bewaking		
Schoonmaak		
Documentmanagement		
Voorzien in ICT		
Vervoer		
Bedrijfsbureau		
Anders, nl.		

17. Op welke hiërarchisch niveau van de organisatiestructuur is de FM afdeling gepositioneerd?

( ) Staf functie ( ) Lijn functie
( ) Onder in de organisatie ( ) Weet niet

18. Hoeveel werknemers in eigen dienst zijn er actief binnen de FM afdeling?

19. Met welke regelmaat vindt coördinatie met het topmanagement plaats?

( ) Wekelijks ( ) Elke 3 maanden
( ) Maandelijks ( ) Er is geen coördinatie
( ) Weet niet

20. Heeft uw <u>bedrijf</u> een strategie voor de vastgoedsector?

( ) Ja ( ) Nee
( ) Weet niet

Zo ja, welke?(meerdere antwoorden mogelijk)

( ) Vastgoedportfolio met gebouwen in eigendom
( ) Huren van gebouwen
( ) Verlagen van leegstand
( ) Turn key huren van gebouwen
( ) Optimale mix eigendom/huren
( ) Return on investment optimalisatie
( ) Optimale cash flow
( ) Minimale kosten
( ) Geen uitbesteding van vastgoed
( ) Anders, nl

21. Heeft uw FM afdeling een strategie voor het geheel van de activiteiten?

( ) Ja ( ) Nee
( ) Weet niet

Zo ja, welke?(meerdere antwoorden mogelijk)

( ) Uitbesteden
( ) Optimale mix van interne services
( ) Verbetering van service en kwaliteit
( ) Bijdrage aan stijgende productiviteit 'core business'
( ) Kostenverlaging
( ) Duurzaamheid/ Maatschappelijk verantwoord ondernemen
( ) Flexibiliteit van service voorziening
( ) Transparantie van kosten
( ) Eigendom verwerven
( ) Concentratie op minder locaties
( ) Anders, nl

22. Welke belangrijke problemen zijn ontstaan door de introductie van Facility Management?(meerdere antwoorden mogelijk)

( ) Implementatie van de nieuwe filosofie
( ) Implementatie nieuwe FMIS
( ) Ondersteuning van topmanagement
( ) Coördinatie
( ) Digitaliseren van plattegronden
( ) Verzameling en structurering data
( ) Data beveiliging
( ) Beveiliging gebouw
( ) Management van kennis (delen van kennis met elkaar)
( ) Training werknemers (FM sector)
( ) Opbouw van nieuwe organisatie units
( ) Anders, nl:

23. Wat zijn de grootste voordelen/ besparingen geweest als gevolg van de introductie van Facility Management, t.o.v. de situatie voor FM? Geef aan in welke klasse de besparingen vallen (in procenten) (meerdere antwoorden mogelijk).

	[%]		
( ) Mogelijkheid tot verlagen en beheersen kosten	( ) 0-25	( )25-50	( )≥50
( ) Tijdsbesparing	( ) 0-25	( )25-50	( )≥50
( ) Synergie effecten	( ) 0-25	( )25-50	( )≥50
( ) Kwaliteitsbewaking	( ) 0-25	( )25-50	( )≥50
( ) Gegarandeerde service voorziening/niveau	( ) 0-25	( )25-50	( )≥50
( ) Standaardisatie van uitbesteding contracten	( ) 0-25	( )25-50	( )≥50
( ) Vergelijkbaarheid aanbiedingen	( ) 0-25	( )25-50	( )≥50
( ) Bundelen van taken	( ) 0-25	( )25-50	( )≥50
( ) Bundelen van uitbestedingprocessen/contracten	( ) 0-25	( )25-50	( )≥50
( ) Bundelen van inkooporders	( ) 0-25	( )25-50	( )≥50
( ) Concentratie op minder locaties	( ) 0-25	( )25-50	( )≥50
( ) Verbetering technische ondersteuning	( ) 0-25	( )25-50	( )≥50
( ) Transparantie van de kosten	( ) 0-25	( )25-50	( )≥50
( ) Stijging van efficiency	( ) 0-25	( )25-50	( )≥50
( ) Afname leegstand van ruimte	( ) 0-25	( )25-50	( )≥50
( ) ISO certificering	( ) 0-25	( )25-50	( )≥50
( ) Creatie van bewustzijn FM	( ) 0-25	( )25-50	( )≥50
( ) Nieuwe tarieven	( ) 0-25	( )25-50	( )≥50
( ) Documentatie van kennis	( ) 0-25	( )25-50	( )≥50
( ) Definitie van standaarden	( ) 0-25	( )25-50	( )≥50
( ) Proces optimalisatie	( ) 0-25	( )25-50	( )≥50
( ) Uitbesteding	( ) 0-25	( )25-50	( )≥50
( ) Betere technische kennis van onderhoud	( ) 0-25	( )25-50	( )≥50
( ) Anders, nl.	( ) 0-25	( )25-50	( )≥50
( ) Geen			

24. Op welke manier is het mogelijk geweest om productiviteit binnen uw FM afdeling te verhogen (efficiency en effectiviteit), door de introductie van FM. Schat het percentage (meerdere antwoorden mogelijk).

	[%]		
( ) Vermindering van ondeskundigheid personeel door het gebruik van informatie systemen (FMIS)	( ) 0-25	( )25-50	( )≥50
( ) Vermindering foutmeldingen door FMIS	( ) 0-25	( )25-50	( )≥50
( ) Mogelijkheid tot aanbieding meer service	( ) 0-25	( )25-50	( )≥50
( ) Verlaging niet productieve uren personeel	( ) 0-25	( )25-50	( )≥50
( ) Verbetering probleemafhandeling door registreren en documentatie van foutmeldingen	( ) 0-25	( )25-50	( )≥50
( ) Betere kwaliteit en beschikbaarheid van data van de activiteiten	( ) 0-25	( )25-50	( )≥50
( ) Anders, nl.	( ) 0-25	( )25-50	( )≥50
( ) Geen			

25. Hoe hoog zijn de eenmalige besparingen in de beginperiode na de introductie van FM geweest, t.o.v de periode daarvoor? Schat het percentage.

26. Wat zijn uw jaarlijkse structurele besparingen na de introductie van FM, t.o.v de periode daarvoor? Schat het percentage.

27. Zou u de introductie van FM beschrijven als succes of mislukking?

( ) Succes ( ) Redelijk succes
( ) Redelijke mislukking ( ) Mislukking
( ) Weet niet

28. Hebt u een proces beschrijving van de taken die verricht dienen te worden door FM?

( ) Ja ( ) Nee
( ) Weet niet

29. Zijn er individuele taken/ processen toegewezen aan personen?

( ) Ja ( ) Nee
( ) Weet niet

30. Hebt u een centrale service desk m.b.t de facilitaire activiteiten?

( ) Ja ( ) Gedeeltelijk
( ) Weet niet ( ) Nee

31. Is uw FM afdeling een aparte kostenpost in uw financiële administratie?

( ) Ja ( ) Gedeeltelijk
( ) Weet niet ( ) Nee

32. Is uw FM afdeling een winstcentrum in uw financiële administratie?

( ) Ja ( ) Gedeeltelijk
( ) Weet niet ( ) Nee

33. Welk percentage van uw facilitaire activiteiten is uitbesteed? (alle taken incl. FM beleid en bedrijfsbureau = 100%; we doen alles zelf= 0%)
(indien 0%, ga verder naar vraag ..)

34. Voor welke diensten gebruikt u een externe service aanbieder (meerdere activiteiten aankruisen is toegestaan)?

( ) Bedrijfsrestaurant
( ) Ruimtebeheer
( ) Werkplek(service)
( ) Technisch onderhoud
( ) Dranken- en versnaperingvoorziening
( ) Receptie
( ) Catering t.b.v evenementen
( ) Verhuizingen
( ) Beveiliging en bewaking
( ) Schoonmaak
( ) Documentmanagement
( ) Voorzien in ICT
( ) Vervoer
( ) Bedrijfsbureau
( ) Anders, nl.

35. Hoeveel externe contractnemers/leveranciers heeft ? (vanaf een afname van >50.000)

36. Maakt u gebruik van externe contractnemers/leveranciers die meer dan een dienst aanbieden?
( ) Nee
( ) Ja, meer dan een facilitaire dienst wordt tegelijk aangeboden door één externe contractnemer/leverancier.
( ) Ja, alle facilitaire diensten worden integraal aangeboden door één externe contractnemer/leverancier.
( ) Anders, nl:

37. Welk type contract gebruikt u meestal?

( )Contract voor uitvoering activiteit
( )Contract over functionele criteria
( )Mix
( )Anders, nl.

38. Wat is de gemiddelde duur van een contract?
( ) 1-2 jaar
( ) 3-4 jaar
( ) Weet niet

39. Maakt uw bedrijf gebruik van een Facility Management Informatie Systeem(FMIS). Zo ja, welke?
( ) Nee (ga verder naar vraag….)
( ) Planon
( ) Ultimo
( ) Axxcent
( ) Nordined- Prequest
( ) Archibus
( ) Eigen Systeem
( ) Anders, nl:

40. Welke deelgebieden zijn georganiseerd via uw FMIS?
( ) Ruimte management
( ) Sleutel management
( ) Financiële administratie
( ) Werkplek management
( ) Gebouw management
( ) Inkoopordes plaatsen
( ) Vastgoed management
( ) Automatisering van gebouwinstallaties
( ) Ruimteplanning
( ) Inventaris management
( ) Onderhoud/inspectie
( ) Service desk
( ) Service management van niet gebouw gebonden apparaten
( ) Verhuizingen
( ) Reservering zalen
( ) Anders, nl:

41. Met welk cijfer beoordeelt u uw FMIS systeem? (schaal 1-5: oplopend)
( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5

42. Met welk cijfer beoordeelt u de leverancier uw FMIS in het algemeen? (schaal: oplopend)
( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5

43. Met welk cijfer beoordeelt u uw FMIS op de volgende deelgebieden? (schaal: oplopend)

Informatiekwaliteit:	( ) 1	( ) 2	( ) 3	( ) 4	( ) 5
Systeemkwaliteit:	( ) 1	( ) 2	( ) 3	( ) 4	( ) 5
Servicekwaliteit:	( ) 1	( ) 2	( ) 3	( ) 4	( ) 5

44. Wat zijn de belangrijkste beweegredenen geweest voor de introductie van een FMIS?

( ) Kostenbesparingen
( ) Verhoging van productiviteit FM afdeling
( ) Verlaging van gebruik van ruimte
( ) Verbetering informatietoegang/ tijdsbesparing
( ) Vereenvoudigen van administratie
( ) Ondersteuning werkprocessen
( ) Modernisatie
( ) Kostenbeheersing
( ) Planning verhuizingen
( ) Datastructurering
( ) Ondersteuning functionaliteit
( ) Anders, nl.

45. Gebruikt u een 'Enterprice Resource Planning' systeem. Zo ja, welke?
( ) Nee
( ) SAP Business One
( ) BAAN
( ) Eigen programma
( ) JD Edwards
( ) Anders, nl.
( ) SAP R/3
( ) SIS
( ) Oracle Financials
( ) Peoplesoft
( ) iGEL

46. Welke deelgebieden zijn georganiseerd via ERP?
( ) Financiële administratie/ accountancy
( ) Personeelszaken
( ) Gebouwautomatisering
( ) Vastgoed management
( ) Inventarisbeheer
( ) Technisch onderhoud/ inspectie
( ) Service desk
( ) Inkoop
( ) Projecten administratie
( ) Anders, nl

47. Met welk cijfer beoordeelt u uw ERP systeem? (schaal: oplopend)
( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5

48. Met welk cijfer beoordeelt u de IT partner van uw ERP systeem? (schaal: oplopend)
( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5

49. Ondersteunt het financieel-administratieve deel van uw organisatie de FM activiteiten?
( ) Ja
( ) Nee
( ) Gedeeltelijk
( ) Weet niet

50. Wat zijn de belangrijkste beweegredenen geweest voor de introductie van een ERP?

( ) Kostenbesparingen
( ) Verhoging van productiviteit
( ) Gebruik van synergie
( ) Anders, nl.
( ) Modernisatie
( ) Kostentransparantie
( ) Weet niet

51. Wisselt uw ERP systeem data uit met uw FMIS?
( ) Ja
( ) Alleen gedeeltelijk
( ) Nee (einde van enquête)
( ) Weet niet (einde van enquête)

52. Hoe is de data uitwisseling tussen ERP en FMIS technisch geïmplementeerd?
( ) Handmatig
( ) Online
( ) Middels batch job
( ) Weet niet

Appendix II Guiding letter questionnaire

Geachte heer/mevrouw,

Mijn naam is Irene Smit en momenteel ben ik bezig met het afronden van mijn Master Facility Management aan de Wageningen Universiteit (onder begeleiding van Prof. dr. Ir. A.F.G.M. van Wagenberg) . Daarvoor doe ik een wetenschappelijk onderzoek naar de toegevoegde waarde van Facility Management bij organisaties. Het verschil in efficiency en effectiviteit van FM is onderdeel van mijn onderzoek. Om dit te onderzoeken heb ik een enquête ontwikkeld die ik op Internet heb gepubliceerd. De enquête is gemaakt met behulp van een gelijksoortig onderzoek dat gedaan is aan de Technische Universiteit in Wenen. De bedoeling is om een vergelijking te maken en de eventuele verschillen te analyseren. Het onderzoek zal een representatief beeld vormen voor de (vooral) kantoorhoudende organisaties in Nederland.

Ik heb enige tijd terug contact met u opgenomen om te vragen of u uw medewerking wilt verlenen aan mijn onderzoek, door het invullen van mijn enquête. U gaf aan dat (misschien) wel te willen, ik hoop dat dit nog steeds het geval is. Wanneer u uw medewerking wilt verlenen zullen uw gegevens volledig anoniem en vertrouwelijk behandeld worden en alleen voor doeleinden gebruikt worden van dit project.

De enquête is geplaatst onder de volgende link: www.thesistools.com/?qid=35218&ln=ned
Het invullen van de enquête zal +/- 20 minuten van uw tijd in beslag nemen. Als u nog overige vragen heeft over de enquête of het onderzoek kunt u deze natuurlijk nog aan mij richten: irene2.smit@wur.nl. Algemene onderzoeksvragen kunt u tevens richten aan mijn begeleider: dries.vanwagenberg@wur.nl.

Bij voorbaat alvast hartelijk dank voor het invullen van de enquête.

Met vriendelijke groet,
Irene Smit
Studente Facility Management
Wageningen Universiteit